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The effects of the equality parameter on mathematics students' performance. A comparative analysis of Peer Education interventions in teaching-learning of linear and quadratic functions.

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Dottorando

Dott. Spagnuolo Alessandro

Tutori

Prof. Borgato Maria Teresa

Prof. Serrano González-Tejero José Manuel

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A Valeria, Giulio, Fabrizia,

mi piace pensare che in questi mesi siate stati al mio fianco
nei momenti di euforia, nei momenti di sconforto,
nel momento della verità.

La ricerca continua pensando a voi...

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Introduction

In 2012 a research project on *Peer Education* in the teaching-learning of mathematics in upper secondary school was activated at the Mathematics and IT Department of the University of Ferrara, Italy.

Peer Education is part of the study of social mediation didactic methods which focus on students working in groups as opposed to the more traditional teachers' direct mediation methods. By being assigned different management roles, the students assemble knowledge together, autonomously pace their work, share the responsibility of their learning process and develop and improve their social relationships at the same time. Everything occurs under the teacher's supervision, who acts as facilitator and organiser of the didactic activities.

The consistent amount of international researches accomplished so far highlights the benefits such didactic methods have both on students' motivation and in their academic performance. Relatively few studies have been conducted in Italy, at upper secondary school level, on the possible application of a social mediation method to the teaching of mathematics, but they all showed how encouraging results can be achieved especially for motivation.

Starting from the outputs of these investigations, this work aims to re-apply these educational strategies to some classes of Human Sciences and Linguistic Licei[1], whose syllabi do not include mathematics as one of the characterising subjects, each class being taught only two or three hours of the subject per week.

In this context a comparison was conducted between three different interactive structures (*peer tutoring*, *cooperative learning* and *peer collaboration*) for two specific didactic units: linear functions and quadratic functions. The most prominent differences among the three approaches relate to the initial team formation and role management and organisation in each team. Such differences are highlighted by the definition of a specific parameter (*equality*). After setting the task structure, the goal structure and the reward structure of the experimentations, the three methods were compared according to two systems: one by observing the students' attitude in the teamwork and their social interactions (observation of the *mutuality* parameter); the other through the analysis of their academic performance at the end of the experience. The results are extremely interesting both to further perfecting the research on the equality parameter and on the students' performances as well as to allow a preliminary analysis on Italian students' behaviour first experiencing group work on learning curricular mathematics.

This work is divided into four chapters:

- Chapter one opens with the analysis of the current level of employment of such teaching methods in Italian upper secondary schools. This overview is fundamental to depict the educational environment in relation to the international one and to contextualise some of the further research targets of this dissertation. The definition of Peer Education is then re-called, highlighting the different meanings of this term and describing its fundamental features. After that, the main aspects related to the theoretical framework used in this work are defined. Such framework is mainly based on the social interdependence theory and on the constructivist theories on learning and development. Afterwards, the three methodologies above mentioned are detailed and a theoretical comparison among them, based on the definition of the equality

[1] A description of the different educational paths at Upper Secondary Education in Italy is available at http://archivio.pubblica.istruzione.it/riforma_superiori/nuovesuperiori [Accessed January 1st, 2017].

and mutuality parameters, is given. Finally, the research objectives are shown, along with some of the most important experimental results from the latest related researches - particularly from those concerning the teaching of mathematics. This thesis will deal with two fundamental issues in particular: the analysis of the effects of the equality parameter on the students' performance while learning linear and quadratic functions; the identification of a first descriptive framework on positive and negative aspects of these Peer Education methods for teaching-learning mathematics in Italian Licei where this subject is not one of the characterising subjects.

- In chapter two the research methodology used to answer the aforementioned research questions is described in detail. The investigation structure, the participants involved and the working procedures employed are first introduced, the three structures (e.g. goal structure, task structure and reward structure) characterising all Peer Education methods and specifically designed for this research are, then, duly illustrated. The explanation of the criteria for group forming and the description of the scheme used for the observation of the mutuality parameter follows. Finally, the research tools used for the analysis of the results on learning, before and after the experiments, along with the organisation of the questionnaires for the evaluation of the experience, are shown.
- Chapter three gives a description of the statistical tests used to observe the effect of equality parameter on the learning results and to analyse the students' answers given to the questionnaires on evaluation of the experience. The objective results deriving from these tests are then presented along with the grade of significance of each analysis.
- Chapter four presents a psycho-pedagogic interpretation of the results obtained and the analysis of the entire experience, both from the didactic and from the socio-relational point of view, is given. In the final discussion the results are seen within the broader context of the current investigative framework and new hypotheses are formulated considering further researches.

Chapter 1

Theoretical Framework - Existing Literature and Research Questions

οὐ γὰρ ὡς ἀγγεῖον ὁ νοῦς ἀποπληρώσεως ἀλλ' ὑπεκκαύματος μόνον ὥσπερ ὕλη δεῖται,
ὁρμὴν ἐμποιοῦντος εὑρετικὴν καὶ ὄρεξιν ἐπὶ τὴν ἀλήθειαν.

Plutarch (Περὶ τοῦ ἀκούειν - De recta ratione audiendi, 48C)[2]

1.1 Application of cooperative methods in Italy

Thirty years ago Damon and Phelps wrote: "*despite the promise of such early attempts and despite the impressive body of literature documenting the developmental benefits of peer interaction, standard models of education have changed hardly at all. Virtually all schooling, in this country* [USA, n.d.r.] *and elsewhere, is structured around the traditional belief that knowledge is best transmitted from adult to child in linear fashion*" (Damon and Phelps, 1988, pp. 135-136). Analysing the data of the last three IARD Institute surveys (Cavalli, 1992; Cavalli, 2000; Cavalli and Argentin, 2010) on life and work conditions in Italian school, this trend seems unchanged. Actually, the delivery format more frequently used among upper secondary school teachers is the unidirectional transmission of knowledge, with a percentage ranging between 78% - 80%, regardless the subject being taught and the school curriculum (being it Licei, Technical or Professional upper secondary school). Only less than 10% - 6.5% and 5.5% respectively for Licei and Technical upper secondary schools - of teachers stated that they often use "*cooperative learning methods*" (Cavalli and Argentin, 2010, table p. 139). Grouping the teachers in the sample by subject, only 19.1% of those teaching scientific subjects showed the "*innovatore coraggioso*"[3] profile - i.e. those who preferred interactive methods and activities such as cooperative learning (Cavalli and Argentin, 2010, table p. 148). As for the teaching of mathematics only, there are not any specific data but the real percentages might be rated as even lower. What could the reason of such educational choices be? There are many teachers who do not know anything about these methods and have never attended a training course on the subject, therefore they do not even have any chance of choosing them. In 2000 IARD survey Giovannini suggested that those teachers who had experienced cooperative education themselves tend, then, to employ it with their students. Similarly, younger teachers who attended SSIS[4] are more

[2] *"The mind needs not filling like a jar, but only kindling, like wood, to instill an impulse to learn and an appetite for truth"*. English translation by the author.
[3] The English translation for "*innovatore coraggioso*" is "*brave innovator"*. English translation by the author.
[4] SSIS (Scuole di Specializzazione all'Insegnamento Secondario) was a two-year post-Graduate Specialization School for Secondary School Teaching. In 2010 the SSIS program was suspended and substituted with TFA (Tirocinio Formativo

inclined to use educational methods based on the cooperative construction of knowledge. These conjectures have been investigated in several international researches (Kohn, 1992; Baines, Blatchford and Kutnick, 2008; Gillies and Boyle, 2010; Thanh, 2011). Saborit et al. (2016), in particular, proved the existence of a negative correlation between teaching experience period and teachers' disposition to implement cooperative methods. Apparently, younger teachers are more disposed to use such educational strategies.

As for the research on implementing these methods for mathematics learning in upper secondary school in Italy, the results have been quite limited, although promising, and they all date back to a fairly recent time (Baldrighi, Pesci and Torresani, 2003; Baldrighi and Bellinzona, 2004; Baldrighi, Fattori and Pesci, 2004; Faggiano, 2005; Faggiano, Pertichino and Roselli, 2005; Faggiano, Roselli and Rossano, 2007; Pesci, 2011; Pesci et al., 2015). Besides the limited amount of data available, the results have often been only qualitative and they do not allow to draw any conclusion on the effective improvement of the students' performance related to the adoption of these methods. Therefore, there are many questions to be answered.

1.2 What is Peer Education?

First, we would like to explain what *Peer Education* is in this research. The Italian phrase *"apprendimento cooperativo"*[5], the literal translation for *cooperative learning*, generally includes the set of all teaching practices based on the interaction among peers. On the contrary**,** here this set is called "peer education", whereas "cooperative learning" indicates a specific method characterized by peculiar elements that distinguish it from other possible interactive structures (Damon and Phelps, 1989; Johnson, Johnson and Holubec, 1996; Serrano, González-Herrero and Pons, 2008).

In the light of this variety of meanings (especially in Italian research papers) we have tried to standardize the terminology in comparison to the previous considerations. Generally, apart from appropriate suggestions, the chosen distinction is the one made by Damon and Phelps (1989). They identify three overriding approaches in Peer Education: *peer tutoring*, *cooperative learning* and *peer collaboration*. In short, the relationship below will be the correct one:

$$p_t , c_l , p_c \in P_E$$

where p_t (peer tutoring), c_l (cooperative learning) and p_c (peer collaboration) are elements of the set P_E (Peer Education) of all teaching practices of interaction among peers.

Once this point is made clear, the heart of the matter can be approached. When talking in general about teaching methods based on interaction among peers, it is important to distinguish the activities proposed here from generic group works. According to Comoglio (1996, p. 32), Peer Education can be described as *"un insieme di tecniche di conduzione della classe nelle quali gli studenti lavorano in piccoli gruppi per attività di apprendimento e ricevono valutazioni in base ai risultati conseguiti"*[6]. However, it would not be correct to identify a Peer Education situation every time groups are set in a

Attivo) a program of formative active school practice. More information is available at http://hubmiur.pubblica.istruzione.it/web/istruzione/tfa [Accessed January 1st, 2017].

[5] The English translation for "*apprendimento cooperativo*" is "*cooperative learning"*. Sometimes the expression "*collaborative learning*" is used, considering the words cooperative/collaborative as synonyms because *"they both characterize a work method based on the fact that participants share their resources in the process that takes place in an atmosphere of positive personal relationships and referring to an assigned disciplinary task*" (Pesci, 2004, p. 639). English translation by the author.

[6] *"A set of class management techniques in which students work in small groups on learning activities and receive evaluations based on the results they achieve".* English translation by the author.

classroom and students are asked to work in group on a given task. According to the German psychologist Lewin, *"the essence of a group is not the similarity or dissimilarity of its members, but their interdependence ... A change in the state of any subpart changes the state of any other subpart ... Every move of one member will, relatively speaking, deeply affect the other members, and the state of the group"* (1948, pp. 84-88). Therefore, each group has its own *interdependence*, a relationship based on mutual dependence among group members towards the achievement of a goal. The element that marks out a learning activity among peers is the positive interdependence occurring when each member feels that he/she is bound to the other peers as an essential part of the group to fulfil their goal - *psychological group membership* - and he/she tries his/her utmost to achieve it - *sociological group membership* (Deutsch, 1949). Once they fulfil the established goal, it is not possible to credit only one person for what has been done. On the contrary, it will be definitely recognized as a group product (Deutsch, 1962). Subsequent studies carried out by Lew, Mesch et al. (1986a; 1986b; Mesch, Johnson and Johnson, 1988) showed that *"group membership and interpersonal interaction among students do not produce higher achievement unless positive interdependence is clearly structured"* (Johnson and Johnson, 1996, p. 793). This improved effectiveness is described graphically by Johnson, Johnson and Holubec through the group performance curve (1996, p. 24).

In this research the relationship of positive interdependence that we have just described is typical not only of the cooperative learning method, as observed in other circumstances. As shown in chapter 3, by working on the same activities (task structure) and with the same rewards (reward structure) in all three teaching approaches, the students' work will be such that the results cannot be credited to only one member of the group. On the contrary, these results come indiscriminately from the interaction among group members, also in the case of methods such as peer tutoring and peer collaboration. Similarly, referring to what Strother (1990) states, the following elements that are essential for the effective productiveness of these works are common to the most popular Peer Education methods.

Promotive interaction encompasses all those behaviors that each group member should have during the activities in order to reach the final goal. For example, in the background of a group debate over a specific problem, expressing one's own opinion, listening to comments and supporting each other represent essential elements for a peaceful development of the discussion, without any fear of making mistakes because everybody is aware that his/her work is constructive. These behaviors are properly acted on condition they are properly trained through the development of *social skills* such as communication, leadership roles and constructive strategies to discuss problems. Actually, grouping students and asking them to cooperate is not enough, since the capacity to interact productively is not innate. On the contrary, it requires an educational path, especially when students have never worked in group before. Even though the goal is the same for each group and all members do their best to achieve it, it is essential to assign an *individual responsibility* to each member as regards what they would do in order to avoid cases such as the *free-rider effect*, the *sucker effect*, the *rich-get-richer effect*, etc. (Johnson and Johnson, n.d.). The systematic performance check inside each group helps making sure that all members take upon themselves their responsibilities. The teacher and the students produce evidence through a metacognitive analysis of the group functionality which has to be planned periodically. Under the learning point of view, this *group processing* can be established by means of extrinsic motivations coming from both individual and group evaluation so as to give the idea that the group does not replace the individual and that all members have to contribute.

In this context, the teacher has an essential role in facilitating and organizing the learning process the responsability of which, however, is gradually handed over to the students. The teacher is no longer the only reference point nor the only source of knowledge in so far as he/she takes on the task of activating, organizing and making the students aware of their responsibilities towards this new type of work (Ashman and Gillies, 2003). In the specific instance, the teacher's tasks can be defined into four main actions: activity planning, learning context management, competences and group work

evaluation and, finally, strengthening and evaluating each individual's cognitive competences (Cacciamani, 2008).

Therefore, such factors have to be carefully considered when planning a cooperative educational intervention whose practical implementation can occur in different ways. In this research, precise decisions have been made as concerns both the theoretical framework and the practical implementation, as detailed in the following chapters.

1.3 Theoretical framework

The theoretical framework of this project involves the review of theoretical material related to the processes of peer interaction treated by the constructivist theory on development and learning and the theory of social interdependence.

The constructivist theory on development and learning, despite embracing many currents, presupposes as the basis of any teaching-learning process that knowledge is the result of a genuine construction of the individual and neither the distribution of innate knowledge, nor the copy of external knowledge. The differentiation arises only when analysing what is part of knowledge, how it is built and who the learner[7] is. Therefore, in order to obtain learning on a general level, from a constructivist point of view, it is necessary to "*operare una soggettiva costruzione di significato, a partire da una complessa rielaborazione interna dell'insieme di sensazioni (percezioni) che, inizialmente, non hanno in sé ordine e struttura*"[8]. This process, clearly, is also "*condizionato dal linguaggio, culturalmente, socialmente e storicamente contestualizzato*"[9] (Carletti and Varani, 2005, pp. 15-16).

The latest trend in the constructivist field aims to merge the different currents into an integrated model based on the definition of the two concepts of situated and distributed cognition. The former means that knowledge is partially a product of the activity, the context and the culture where it develops and is used. Learning is easier when surrounded by an appropriate environment, whose instruments and characterising cultural notions are known, as opposed to utterly abstract and decontextualized situations which enhance only individual mental and cognitive abilities (Brown and Cole, 2001). The latter refers to the fact that, in order to face real issues or in problem solving, the cognitive structure (mind/memory) of the individual is not the only feature involved, as also external artefacts and resources, e.g. textbooks, multimedia and digital instruments are equally important (Hutchins, 1995). Therefore, being cognition both situated and distributed, the notion of *community of practice* (or learning) has been developed, referring to groups of people learning together, using common instruments in the same environment (Saso and Oliver, 2003).

Designing an educational intervention based on building communities of learning in a class, it is not possible to overlook Deutsch's contribution to the description of the social phenomena typically occurring in a group of people pursuing a precise goal. Considering the educational focus of this work, Deutsch's contribution can be summarised in two fundamental concepts: the characterisation of psychological and social processes which could simplify or complicate the results of a team work and, consequentially, the study of the conditions leading to a constructive or destructive process in case of discord among the members. In the wake of these two aspects, a conscious design of the goal structure[10] of this educational intervention was fundamental, because the targets of a work deeply

[7] For a further insight on constructivist currents see Serrano and Pons (2011).

[8] *"Operate an individual construction of meaning, starting from a complex internal re-elaboration of all the sensations (perceptions) which, initially, have neither order nor structure".* English translation by the author.

[9] "*Conditioned by language, as culturally, socially and historically contextualized*". English translation by the author.

[10] See the description of the goal structure of this educational intervention in section 2.2.

influence the behaviour of the team members involved and their models of interaction (Deutsch, 2014). Furthermore, being the autonomous acquisition of knowledge by the students through team interaction the final goal of this work, it is possible for conflictual situations to occur along the way. In these cases it is fundamental for the students to undertake specific practices aiming to cooperatively go beyond their difficulties, because "*the characteristic processes and effects elicited by a given type of social relationship also tend to elicit that type of social relationship, and a typical effect tends to induce the other typical effects of that relationship*" (Deutsch, 2011, p. 283). This law, named *Deutsch's crude law of social relations*, involves the fact that if the students manage to solve conflicts cooperatively, the resolution process will be constructive; in the opposite occurrence, the response to an exclusive or conflictual behaviour will be destructive (Pons and Serrano, 2015).

In the teaching-learning of mathematics the solution of cognitive obstacles, especially during discovery activities, is realised through the development of one's own ability of focusing on one's own ideas and doubts on the problem. In this context the ability of argumentation and reasoning are fundamental, and they can be defined as "*processi eminentemente discorsivi che risultano da un intreccio tra rappresentazioni simboliche (come segni dell'aritmetica e figure geometriche) e attività discorsive su queste, con cui il soggetto dà significato ad enunciati matematici che sono generalmente di tipo misto (segni specifici del linguaggio simbolico proprio della matematica e parole del linguaggio naturale)*"[11] (MIUR-UMI-SIS, 2003, p. 1, "*argomentar*e" section). The task structure was therefore specially designed to favour the development of argumentation, practically identified according to the following idioms (Pesci, 2016):

a) *Reductio ad absurdum*

b) *Modus ponens*

c) Examples and counterexamples

d) Different components of representation

e) Verbalisation in "autonomous" solving strategies

Therefore, the synergy between the elaboration of cooperative actions and the development of argumentative skills is a fundamental element of this work in the development of a common knowledge related to mathematics. This choice involves the analysis of educational processes in their entirety and complexity, dealing not only with the subject itself but also with the quality of social and personal relationships in these processes. As a consequence, the traditional educational scheme knowledge-teacher-pupil is reinterpreted, focusing on a "*double polarity*" among the subject and the relationships[12]. Every cognitive act is therefore to be considered as "*un'attività che coinvolge sempre tutte le componenti delle persone, ad esempio la sensibilità, le emozioni, l'impegno, l'assunzione di rischi, le decisioni, le scelte, le credenze, il rispetto per gli altri"*[13] (Pesci, 2003, p. 527), whose effect will develop within a "*mathematical discussion*", defined as a "*purposeful talk on a mathematical subject in which there are genuine pupil contributions and interaction"* (Pirie and Schwarzenberger, 1988, p. 461). This proposition opens a new issue on the maximisation of the effectiveness of the common knowledge of mathematics through the processes of interaction.

According to Piaget's cognitive constructivism, working with peers could represent an inexhaustible source of disturbance for a learner. The juxtaposition of different points of view of the participants to

[11] *"Mostly discourse related processes, resulting from the entanglement of symbolic representations (as arithmetic signs and geometric figures) and discourse related activities on those, according to which the individual is able to give meaning to usually mixed mathematic formulations (specific signs of the symbolic language of mathematics and words of natural language)".* English translation by the author.

[12] For a more detailed analysis see Pesci (2015) and Baldrighi, Pesci and Torresani (2003).

[13] *"An activity always involving the whole person, e.g. their sensibility, emotions, engagement, willingness to take risks, decisions, choices, beliefs, and respect for others".* English translation by the author.

a debate could in fact lead to different overviews on the issue treated. If these differences are moderately divergent, cognitive conflicts emerge, undermining one's own beliefs and starting the self-regulation process developed in the balance-disturbance-unbalance-regulation-new balance phases. The resolution of the controversy leads therefore to a new balance, involving a deeper comprehension compared to the starting knowledge (Piaget, 1965). Therefore, peer interaction could play an important role in this equilibration theory and in the acquisition of knowledge. In order to implement these processes of increasing equilibration it is necessary for the participants not to differ very much in their knowledge; therefore Pons' and Serrano's (2015) hypothesis relies in the hierarchic equivalence of the members of the same team, according to the perspective of Piaget's school of Geneva.

On the other hand, according to Vygotsky's socio-cultural perspective, the development of superior cognitive functions occurs on two levels: it develops first on a social and then on a psychological level. Consequently, aiming to an interaction-based educational intervention, it is appropriate to introduce a mentor, because "*the only good kind of instruction is that which marches ahead of development and leads it*" (Vygotsky, 1986, p. 188). This perspective presupposes that the participation of the learner to cultural activities led by a more expert individual aims to the internalisation of new competences related to his social group. In this way "*what the child can do in cooperation today he can do alone tomorrow*" (Vygotsky, 1986, p. 188). Anyway, this acquisition is possible only working inside the students' zone of proximal development, i.e. "*the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers*" (Vygotsky, 1978, p. 86). This aspect is not to be overlooked, because the aid of the mentor on topics already in the zone of actual development could be irrelevant (Mahn and John-Steiner, 2013). In the wake of these observations it is possible to maintain that, drawing inspiration from this socio-cultural perspective of constructivism, the learning process is effective only if the subjects interact with at least one fellow member on a higher level of expertise.

1.4 Implementation of Peer Education methodologies

The implementation of the above-mentioned constructs draws the attention back to the employment of learning methodologies based on interaction among peers. In this field, countless strategies can be adopted as many as the strong points and the weak points resulting from their use[14]. The choice of a methodology influences the typology of interdependence created among the group members which, in turn, can be affected by the coordination of two specific structures: task and reward structure. The former describes the organisation of the teaching activities to be accomplished within the groups, including both formative and assessment activities. The latter relates to the consequences caused by the performances assessed in the task structure.

Among the most studied Peer Education methodologies we can mention *peer tutoring*, *cooperative learning* and *peer collaboration* (Damon and Phelps, 1984; 1988).

In peer tutoring, group formation includes the presence of one tutor (or more) and of tutees, generally assuming that the former are students possessing solid prerequisites or greater knowledge than the latter on the subject in question. Therefore, the tutor has definitively a greater control of the

[14] Examples of the most widespread approaches: Aronson et al. (1978); De Vries and Slavin (1978); Sharan and Hertz-Lazarowitz (1980); Johnson and Johnson (1975); Kagan (1985); O'Donnell and Dansereau (1992). For a comprehensive list see Serrano, González-Herrero and Pons (2008, Chap. 3). The most recent strategies include: small group learning (Springer, Stanne and Donovan, 1999), peer instruction (Baker, Gersten and Lee, 2002), problem based learning and technology-aided instruction (Haas, 2005).

information and of the assigned task compared with the tutee. For this reason, the two students do not possess equal status in their didactic relationship. Under many respects, peer tutoring reminds of the traditional teacher-student relationship, although there are some important differences: first of all, the tutor has not the same degree of authority on the tutees that the teacher instead has, as well as he does not have command of the subject and does not possess solid didactic knowledge. Apart from that, the relationship of closeness between knowledge and status might make the tutee feel more free about expressing opinions, asking questions and providing rash answers.

Cooperative learning is the umbrella term covering a number of approaches to team learning[15]. The common characteristic of these approaches is the division of the classes into "teams" or "learning centres", usually made up of no more than three or four members each. Learning groups are generally heterogeneous in relation to skills; even though in some versions of cooperative learning students take on different roles, only rarely is there a feeling that one specific role is superior to the others. Naturally, there may be differences in the disciplinary skills of the participants, as well as in the leadership skills and so on; therefore, in practice, such differences may determine who is controlling the didactic exchange.

In peer collaboration, groups are formed in such a way that students have equal competences and, unlike cooperative learning, they are asked to work jointly all the time on the same problem rather than individually on separate parts of it. In its original form, this methodology envisages that students work together in order to solve stimulating learning exercises that would be difficult for them to solve individually. Complicity in the process of discovery, a continuous feedback exchange and a frequent sharing of new ideas all develop with this method (see for example the introduction of the concept of conservation in Doise, Mugny and Perret-Clermont, 1976). Undoubtly, unlike the individual discovery learning process, *"by working closely with another novice, difficulties become a challenge rather than a torment"*; on the other hand, though, *"the formation of wrong ideas caused by the lack of control / of justification (on the part of the student) during work and/or by the lack of a prompt intervention by the teacher, may lead to the development of ideas which prove difficult to eradicate in the long term"* (Damon and Phelps, 1989, p. 5).

From the theoretical point of view, in order to describe and compare the different cooperative methodologies, the latest studies in the field of Peer Education focus on the analysis and the evaluation of two specific parameters: *equality* and *mutuality*.

The equality index measures the degree of symmetry among the tasks assigned to the students in a peer learning activity; consequently, it illustrates the work distribution among group members, which is already defined by the teacher at the beginning of the activity by assigning specific work instructions. The mutuality index illustrates instead the degree of interconnection, depth and multi-directionality of communications among students; therefore, it refers to both quantitative (statements, requests/offers of explanation, etc.) and qualitative aspects (respect, interest, accord, etc.) of ongoing conversations. This parameter may be measured only during and at the end of group work (Berndt, 1987; Spagnuolo and Canducci, in press).

If we hypothesise of assigning the equality parameter a value ranging between 0 (strong asymmetry among group members) and 1 (essentially symmetric distribution), we may define whatever cooperative strategy by analysing respectively the instances in which the index acquires a low, average or high value. The greatest issues arise when studying and analysing the mutuality parameter, given that the interaction that may develop within a peer discussion is rather varied and difficult to connect to the equality parameter in question, as we will soon observe in a series of examples.

[15] As we have seen in section 1.2, it is worth remembering that cooperative learning is, along with peer tutoring and peer collaboration, a specific form of Peer Education.

An initial comparison among the aforementioned methods was realized starting from the examination of these two indicators (Damon and Phelps, 1989; Serrano, González-Herrero and Pons, 2008). For example, affirming that in peer interaction equality is scarce, amounts to saying that we are facing a situation with a strong disparity of the roles assigned within the group. This occurs in a tutor relationship in which the tutors are required to perform a role comparable to the one of the teacher towards his own tutees, but with some differences: *"innanzitutto, il tutor non possiede lo stesso grado di autorità sui tutorandi di cui invece dispone l'insegnante, così come non padroneggia la disciplina e non dispone di solide competenze didattiche. Ad ogni modo, la vicinanza per ciò che concerne il bagaglio di conoscenze e lo status potrebbe far sentire il tutorando più libero di esprimere opinioni, fare domande e di rischiare risposte azzardate"*[16] (Spagnuolo and Canducci, in press). The tutor therefore has a greater control over the information and the assigned task compared to the tutee and this is the reason why they do not acquire an equal position in their didactic relationship. With regard to the mutuality parameter, it is not possible to predict its value a priori. For example, if the tutor takes his role to heart working on the possible problems of the tutees and, at the same time, the latter do not refrain from asking for clarifications, then the quality of the interaction will probably be high. This behaviour is not given for granted. In fact, at the beginning "*la forma di aiuto più spontanea è quella di svolgere il compito al posto dell'altra persona"*[17] (Cohen, 1999, p. 64). Actually, some problematic situations might arise from using this modality, as in the case of the two phenomena of *productivity deviation* and *polarization* (Carletti and Varani, 2005). In the first case, if the students perceive that the purpose consists exclusively in the achievement of the final result, only the most productive students will probably emerge while the weaker ones will be left out. The second case occurs when there is a contrast of views leading to the development of two distinct factions; an impasse or even a rift within the group develops like, for example in the case of two tutors who do not agree with each other. These circumstances may obviously occur not only in peer tutoring, but in every kind of peer interaction.

If we consider an average-high value of equality, the distribution of tasks will not result exactly symmetric but not even poor as in tutorship. Cooperative learning is a methodology that satisfies these characteristics, in so far as it is based on the subdivision of the class into internally heterogeneous groups in relation to skills. Within the groups every member is called on to give his contribution for the achievement of the final objective. Also in this case, the values acquired by the mutuality parameter greatly vary depending on several elements, which most of the times are tied to the social dynamics developed. We refer, for example, to *fusional deviation* when the members are focused exclusively on interpersonal relationships, independently from the task and at the expense of the result. One solution to avoid such situations envisages the use of a *jigsaw* strategy (Aronson et al., 1978) which involves two phases: in the first one work is assigned in such a way that each member specialises on one peculiar aspect of the task; in the second phase, by sharing the peculiar aspects they have studied individually, the group is able to learn the subject in its wholeness and, at the same time, complete the assigned task. In this case, what becomes evident is the importance of the role played by each member in achieving the final objective, as well as the expected interaction with several groupmates, even with those not belonging to one's own group, with the result of containing discussions among the same people.

Finally, a methodology definitely marked by a high value of equality is peer collaboration. In this case, the members of each group generally share the same degree of knowledge. Moreover, since everyone has to work on the same questions at the same time, no student will have a superior status to others'. Therefore, the distribution of roles within the group should theoretically be symmetric.

[16] *"First of all, the tutor has not the same degree of authority on the tutees that the teacher instead has, as well as he does not have command of the subject and does not possess solid didactic knowledge. Apart from that, the relationship of closeness between knowledge and status might make the tutee feel more free about expressing opinions, asking questions and providing rash answers".* English translation by the author.

[17] *"The most natural way to help someone is to deal with the task for the other person".* English translation by the author.

However, in practice even in this case imbalances may occur, for example as in the case of *pairing* in which only some members actively interact and participate, monopolising the discussion while others keep to the sidelines.

Ultimately, once a Peer Education methodology is chosen, the evaluation of its corresponding equality parameter can be obtained by analysing the roles assigned to the students. The analysis of this index only, though, is not sufficient to establish the effectiveness of an interactive modality. The influence of the amount of interactions among the group members must be taken into consideration. The issue of observing and evaluating class relational competences is a current matter not only in educational research but also among teachers-educators attentive *"non solo all'insegnamento dei contenuti disciplinari specifici, ma anche all'instaurarsi di relazioni personali alla base dei processi di apprendimento"*[18] (Baldrighi, Pesci and Torresani, 2003, p. 177). This aspect plays a prominent role in the implementation of educational strategies based on social mediation and is one of the most probed and discussed subjects in the latest experimental researches.

1.5 Experimental research

Not rarely group-based activities are thought of as cause of inattention or, worse, as an incentive towards antisocial behaviour and activities among students (Damon, 1984). In fact, psychological and educational research has already shown the benefits of a correctly performed interactive activity among peers not only on their cognitive development (Kuhn, 1972; Doise, Mugny and Perret-Clermont, 1976; Murray, 1982; Dansereau, 1985; Webb, 1985), but also on their motivation and social relationships (Sharan, 1980; Kagan, 1983; Slavin, 1990; Johnson, Johnson and Stanne, 2000; Baldrighi, Bellinzona and Pesci, 2007). Significant results can be obtained only after an attentive and constant implementation which, in most cases, can require up to a year of work, through a tricky journey full of pitfalls (Carletti and Varani, 2005; Johnson and Johnson, 1980).

To be fair, it is important to remember that, as late as the '80s, not all the experimental results showed the positive effects of cooperative methodologies on learning. According to Webb (1983), this ambiguity was caused by the fact that the acquisition of knowledge is not guaranteed by all typologies of interaction. Taking as starting point the definition of the equality and mutuality parameters, these methodologies have been classified and more deeply compared, as these two indices describe duly *"la calidad y cantidad de las interacciones y, por tanto, la eficacia de los procesos de interactividad"*[19] (Pons et al., 2012, p. 87). Actually, albeit it could be theoretically assumed that high levels of equality correspond to high levels of mutuality and that, for middle-low levels of the first parameter a regularity with the second cannot be established[20], the most recent experimental research has shown how high, middle and low levels of mutuality can be observed in all the three interactive structures (Serrano and Pons, 2007). These results show how both indices are strongly linked to each other and that the research should be focused on the study of such interdependence and not only on the study of a variable as a function of the other.

On the basis of experimental observation showing that in the cases with high mutuality the quality of communicative exchanges is better and favours acquisition of knowledge (Hooper, 1992), one of the current objectives concerns the examination of the conditions in which such index can be maximised through the management of the task structure, reward structure and goal structure and in function of

[18] *"Not only to teaching specific disciplinary contents, but also to the building of interpersonal relationships at the base of learning processes".* English translation by the author.

[19] "*The quantity and the quality of the communicative exchanges and, consequently, the efficiency of interaction processes".* English translation by the author.

[20] This hypothesis was formulated by Colomina and Onrubia (2001) as the values are supposed to depend on whether or not the members involved respect the roles.

the selected interactive structure (e.g. peer tutoring, cooperative learning or peer collaboration). In order to achieve this, it is important to have precise tools that can identify and evaluate the mutuality parameter. From the analysis of the existing literature, Pons et al. (2012) have identified at least six attributes that describe this index: formulation of one's own point of view, disposition to dialogue, production and achievement of appropriate help behaviours, roles coordination, reciprocal control of work, quality of the conversation. Despite some limitations linked to the academic (university) and educational environment (pedagogic and psychological), the observational scheme they propose represents a valid solution to the analysis of peer interaction processes. In section 2.6, we will try to re-adapt this tool in order to analyse the communicative exchanges occurring among upper secondary school students involved in maths activities.

The ambiguities above mentioned and found at the beginning of the '80s have been finally established after conducting several meta-analysis, above all those made by the Cooperative Learning Centre Research Group, at the University of Minnesota, under the coordination of Johnson brothers (Johnson et al., 1981; Johnson and Johnson, 1987; Johnson et al., 1983; Johnson, Johnson and Maruyama, 1983; Johnson and Johnson, 1989). Such studies have finally demonstrated the superiority, within the educational field, of the cooperative methodologies against the competitive methodology and the individualist methodology. In the former students work in competition among each other to obtain better results, in the latter the acquisition of knowledge occurs individually and independently from the others' performances (Johnson, Johnson and Holubec, 1996). The results obtained can be summarised as follows: "*las situaciones cooperativas son siempre superiores a las competitivas y a las individualistas, si se dan ambas de una forma pura, como si las situaciones de cooperación y competición se dan en forma pool intra y/o intergrupos, no constatandose nunca, por otra parte, diferencias significativas entre la competición personal y los esfuerzos individualistas"*[21] (Serrano, González-Herrero and Pons, 2008, pp. 116-117).

Following the conclusions achieved in the first generation of studies, the new research interest has been subdivided into four specific areas concerning: the dynamics within the Peer Education methods, teachers' training, how to learn cooperation and the use of Peer Education in specific areas of the curriculum. In the following section, the most recent results achieved in the specific field of teaching-learning mathematics will be shown.

1.5.1 Peer Education in mathematics

The initial researches on the application of cooperative methodologies into this specific educational area have not shown, generally speaking, significant results in the learning of mathematical concepts and in the development of principles of problem solving (Golton, 1975; Gilmer, 1978; Davidson, 1979; Weissglass, 1977; 1979). Nevertheless, in cases in which the activities were focused on the use of simple abilities (e.g. calculus, comprehension of simple concepts, resolution of problems with elementary level of difficulty), the most significant results have been produced by those methods which implied forms of extrinsic motivation (e.g. a system of group assessment based on individual performance of each of its members). More specifically, these methods are: TGT (DeVries and Slavin, 1978), STAD (Slavin, 1978) and TAI (Slavin, 1985), created by Slavin and his research group.

As for the aspects linked to the interaction typology to be established among the students, the initial researches in this field have focused, above all, on tutoring models where the improvement in the students' performances were linked to detailed explanation provided by the tutor rather than to the

[21] "*Cooperative situations are always superior to the competitive and individualist ones, both when they are considered in a pure form and in the cases in which cooperation and competition are mixed within a group or between groups; moreover, significant differences between competition and individualist situations have never been noted".* English translation by the author.

affirmative/negative answers on the solutions defined by the tutees (Devin-Sheeman, Feldman and Allen, 1976; Webb, 1983).

The subsequent researches[22] based on learning groups observation, have later demonstrated how peer interaction can contribute to the formulation and the sharing of multiple representations of the same problem/idea (Smith, Johnson and Johnson, 1981) and to the development of a critical mind (Johnson, Johnson and Smith, 1991). Following Webb's studies (1991), some significant elements that influence the learning of mathematics in peer-directed small groups have been found. Providing other students with detailed explanation strongly improves learning results as well as being given non descriptive feedback, or correct answers without any explanatory comment causes even worse results. Group formation, the ability of the individual students and their perception of the subject are all elements that strongly influence group interaction. Many of these results have therefore been taken into account in order to structure the didactic experiments and select the items to be used to observe the mutuality parameter (see section 2.3 and 2.6).

The improvement and the adjustment made by the researches over the last thirty years, have finally allowed to demonstrate also in mathematics the superiority of Peer Education - in any of its forms (e.g. tutoring, cooperation or collaboration) - against the other didactic strategies (Hossain and Tarmizi, 2013; Ke and Grabowski, 2007; Lehrer and Lesh, 2013; Nunnery, Chappell and Arnold, 2013; Özsoy and Yildiz, 2004; Roseth, Johnson and Johnson, 2008; Winne and Nesbit, 2010; Zakaria et al., 2013). In conclusion, such efficiency depends on correctly harmonizing five main elements: the tree task structures, goal and reward structure and the two equality and mutuality parameters (figure 1).

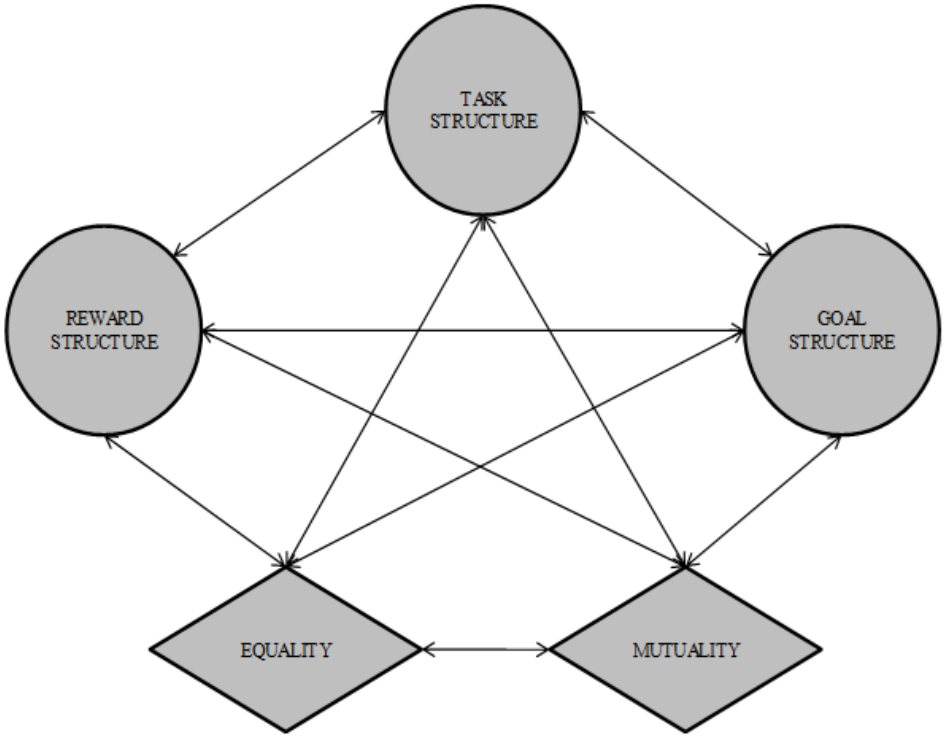

Figure 1 – The five key elements determining the effectiveness of a cooperative methodology[23]

[22] Despite these researches have not been shaped exclusively on mathematical concepts, their results show the improvement of some fundamental elements which characterise an efficient mathematical discussion.

[23] Flow chart taken from: "*Cooperative learning in mathematics: a study on the effects of the parameter of equality on academic performance*" (Pons et al., 2014, p. 833).

1.6 Research questions

Pons and Serrano (2015) have recently wondered about which cooperative organisation would result in being more efficient among the peer tutoring, cooperative learning and peer collaboration methodologies[24]. More specifically, the concepts faced by these authors concern the possible influence caused by the content of the subject to be learned and the qualitative variation of the mutuality parameter, when passing from one interactive structure to the other. The questions they have designed are the following:

- Is it likely that the different subject contents require different interactive structures according to students' previous knowledge?
- Is the mutuality characterising homogeneous groups qualitatively different from the one which characterises heterogeneous groups?

The results deriving from this comparison among the three methodologies within the university field and on psychology contents have shown how the academic performance surely results to be influenced by contents typology, in particular by the previous students' knowledge on the topic. Furthermore, an influence on learning, caused by mutuality, can be clearly outlined, as a sign that *"dialogical argumentation fosters the acquisition of knowledge as long as the conditions and the interaction processes are adjusted to certain patterns and respect certain rules"* (Pons and Serrano, 2015, p. 311).

Once the authors have assessed the veracity of the answers to the previous questions, the authors add one more question:

- How do we know whether the differences in the performance among the students, whose typology of cooperative work follows different values of the equality parameter, are to be ascribed to this higher or lower grade of within-group homogeneity or to the influence of the mutuality parameter which characterises each methodology?

In this case, no significant differences among the methodologies have been found, despite the fact the relation of peer tutoring has demonstrated to be significantly the most efficient in those pieces of the subject in which a conceptual exchange was required.

Because of these results, the answers to the previous questions will be researched in this thesis, working on two mathematical contents, studied at upper secondary school: linear functions and quadratic functions. In particular, given the variety of the scholastic path within the upper secondary school in Italy, the investigation has been contextualized in the case of the Human Sciences and Linguistic Licei[25]. This choice has an additional reason: in these Licei mathematics is not a main subject and, most of the times, students do not particularly like this subject. For this reason, given the low frequency of employment of these methodologies within the Italian schools, this work will also include a qualitative analysis on the perception students have of the application of Peer Education methodologies in teaching and learning mathematics.

[24] It has to be specified that the comparison made by the authors also contained a distinction between the cooperative groups in which the members could split the work among themselves (*cooperation with task division*) and the others in which this was not possible (*cooperation without task division*).

[25] A more detailed description of the characteristics of these Licei will be discussed in section 2.2.

Chapter 2

Methodology

If we knew what it was we were doing,
it would not be called research.

Anonymous

2.1 Design

This section describes in details how the five elements which influence the effectiveness of any cooperative method – three structures (task, goal, reward), two parameters (equality, mutuality) – have been structured and observed in the current investigation.

It is worth underlining that one of the research questions of the current work aims to compare the potential effects of a specific interaction modality among peers on students' performance. Therefore, an attempt to minimise the influence of the remaining variables has been made: some variables have been considered as constants (e.g. task structure, reward structure, goal structure), the others have been considered as covariables (e.g. mutuality, given its interdependence with the equality parameter).

Consequently, at the end of the experimentations, a fixed-effects factorial analysis has been implemented, in which the equality parameter has been considered as the independent variable (three level factor) and the performance as the dependent variable, being the mutuality parameter a covariable.

Furthermore, in order to collect information on how the students perceive the use of Peer Education methods in the teaching of mathematics, their attitude towards their own learning process has been statistically and qualitatively analysed through a re-elaboration of the end of experience discussions and through the analysis of the results of some questionnaires distributed at different times.

2.1.1 Participants

The classes[26] involved in the study were:

[26] The Italian terminology for school has been maintained in this work. Italian school classes are formed at the beginning of the school cycle (primary school, lower or upper secondary school) and are formed by groups of 20-30 students of the same grade; these groups are fixed for the entire cycle, therefore Italian students do not rotate classes and courses (as teachers do) and remain in the same group for all the grades of the cycle.

- One first grade class and two second grade classes[27] (indicated by X_{11}, X_{22} and X_{23}, where the first subscript indicates the year of the cycle and the second one indicates the class considered). The first grade class is from a Linguistic Liceo, the second grade classes are from a Human Sciences Liceo[28]. The sample consists of 65 pupils (27 boys and 38 girls) aged 14 - 16. 24 pupils come from the first grade class and 41 from the second grade classes. Despite the diversity of curriculum and age, all the classes have worked for the same amount of time - two hours per week, for a total amount of 20 hours - and on the same topic, regarding linear functions, according to the guidelines for specific learning targets of mathematics in the first two-year period of upper secondary school as reported in the *Indicazioni nazionali per i Licei* in the chapter "*Relazioni e funzioni*"[29] (MIUR 2010c, p. 271 and p. 435). None of the students involved had previous experience in any Peer Education methods (e.g. peer tutoring, cooperative learning and peer collaboration).
- Three third grade classes[30] (indicated by X_{31}, X_{32} and X_{33}, where the first subscript indicates the year of the cycle and the second one indicates the class considered), two of them are from a Linguistic Liceo and one a Human Sciences Liceo (Socioeconomic specialisation). The sample observed consists of 76 pupils aged 16 - 17 (13 boys and 63 girls). Despite the diversity of curriculum and age, all the classes have worked for the same amount of time - two hours per week, for a total amount of 20 hours - and on the same topic, regarding quadratic functions, according to the guidelines for specific learning targets of mathematics in the second two-year period of upper secondary school as reported in the *Indicazioni nazionali per i Licei* in the chapter "*Relazioni e funzioni*"[31] (MIUR 2010c, p. 272 and p. 436). None of the students involved had previous experience in any Peer Education methods.

The lectures have been assigned to the author in collaboration with the other five lecturers who usually teach in one of these classes respectively[32]. This choice strongly characterises the research, and it was made according to the following considerations:

- Despite their regular attendance at ongoing update programs, none of the teachers involved in the investigation had previously experienced any Peer Education methods.
- The process of implementing a cooperative didactic unit is not easily mastered as it requires continuous and specific training (Angelides, Stylianou and Leigh, 2007; Sharan, 2010).
- Every single person throughout his/her life carries "*la propria cultura fatta di conoscenze, di valori, di punti di riferimento"*. Especially "*nel caso degli insegnanti ciò assume particolare rilevanza perché la loro cultura, la loro <<impronta>>, viene riproposta con cadenza triennale o quinquennale (talvolta biennale) a leve sempre nuove e sempre diverse di studenti*"[33] (Cavalli, 1992, p. 49). Therefore, the predictable influence from teachers on the

[27] Italian grade numerals start again every cycle. These specific grades refer to upper secondary school, therefore in this case a first grade corresponds to a ninth grade, a second grade to a tenth grade and a third grade to an eleventh grade.
[28] Italian upper secondary schools are diversified by curriculum, so the courses revolve around pivotal subjects common in every curriculum (such as Italian, mathematics, P.E., English) and specializing subjects of the chosen curriculum (a second and a third foreign language for Linguistic Liceo, psychology for Human Sciences Liceo, painting, sculpting and photography for Art Liceo and so on). These are examples of Licei, whereas the Technical and Vocational upper secondary schools of many other curricula – and other Licei – will not be treated in this work. The educational qualification of every curriculum of upper secondary school in Italy is the same, being it Liceo, Technical or Vocational, and it allows the graduates to enter university or the workforce independently.
[29] The name of the note by the Italian Ministry of Education and Research has been left untranslated for philological purposes. For a detailed analysis of these guidelines see section 2.2.
[30] See note 27.
[31] See note 29.
[32] Two third grade classes were assigned to the same teacher.
[33] *"His or her own culture made of knowledge, values, references. […] This is particularly relevant in the case of teachers, because their own culture, their <<stamp>>, is constantly reproposed every three or five (sometimes biyearly) years to always new and always different groups of students".* English translation by the author.

classes has been "neutralised" as much as possible, in order to exclude this variable from the future statistical analyses.

For these reasons, and because of the importance of the role of the teacher in this methodology (Gillies, 2004; Johnson and Johnson, 1999), it was preferred not to appoint the sample-classes' teachers with the leadership, although they were admitted as observers. However, their very presence may have influenced many elements, the mood of the students or some explanations, for example. Also, as the researcher covers the role of the lecturer within the research experience, his personal opinions and views, on the final results, may have somehow indirectly influenced the students' learning experience. However, being this an exploratory investigation and being the analysis unrelated to any clear hypothesis to be confirmed, the possible limits caused by the decision previously made would have limited consequences and a low impact on this research.

2.1.2 Procedure

A different Peer Education model was adopted in each class: instead of the generic X_{ij}, A_i will be used for the classes taught with a peer collaboration method, B_i for the classes taught with the cooperative learning model and C_i for the classes taught with the peer tutoring model, where the meaning of the "i" index follows the same rules as already described in paragraph 2.1.1. This follows the opinion that different teaching approaches within the same class would have been dispersive. Therefore, the choice of one specific model per class was preferred.

The students were shown, prior to the start of the task, the structure of the project and the key points of the cooperative method with which they would be dealing. Neither the interactive structures used in the other classes nor the eventual comparison of the results were mentioned on purpose, to avoid creating a competitive environment and to discourage any recriminations on the composition of the teams. Therefore, only the group formation and the functions assigned to each member closely related to the model of each class were communicated. More specifically:

- In classes A_i highly homogeneous teams were formed using the peer collaboration model: the students had to perform every activity at the same time on a worksheet that was the same for each member, without being allowed to split the work among different members.
- In classes B_i relatively heterogeneous teams were formed, using the cooperative learning model: the students could choose, only on some activities, whether to split the work among them or not. In this case, therefore, no distinction was made within the moderately heterogeneous teams, between those who were to work together on a specific task and those in which a distribution of the task was possible[34].
- In classes C_i highly heterogeneous teams were formed, with the peer tutoring model: the students had to perform every activity on a worksheet that was the same for each member, carefully ensuring they kept the role of tutors or tutees they were assigned.

Each team consisted of a maximum of 3 or 4 units, because *"con l'aumentare delle dimensioni del gruppo le abilità interpersonali [...] richieste per gestire le interazioni tra i membri diventano molto più complesse e sofisticate"*[35] (Johnson, Johnson and Holubec, 1996, p. 42).

[34] In other researches (Pons and Serrano, 2015) where this distinction was considered, the results did not provide any significant difference among the two approaches.

[35] *"By increasing the capacity of a group/team, the interpersonal skills […] required in order to manage the interactions among the members become increasingly complex and sophisticated".* Re-translation from Italian by the author.

The formation of the groups was mostly based on the results of a test on the prerequisites and from a pre-test on learning objectives[36], which were both administered before the investigation.

In similar academic researches, the criteria for group formation was based on students' previous grades in the same course (Hsiung, Luo and Chung, 2014, Pons and Serrano, 2015). Given the diversity of the sample, selected among different classes and schools, ages and curriculum, the choice was limited to these two tools as a more effective method in order to objectively evaluate the students' entrance knowledge and to compare the two performances (difference between the pre-test and the final test) at the end of the experience.

What is the reason for using two initial tests? How do they differ? In order to organise the groups according to the criteria previously shown, the first question to be answered related to the students' initial knowledge on the learning objectives they would be working on. The ratio for this question is that, initially, the knowledge and the competences to be considered for the group formation concern the content to be studied, and not the ones already learnt, which are usually called *prerequisites.* According to Damon and Phelps (1989), for example, a tutor can be a student with more control on the information and on the assigned task, not necessarily only on what previously learned.

This concept caused doubtful reactions from the teachers involved in the research, because, being mathematics a highly preparatory-based subject, their assumption was that students cannot be expected to know anything on a new content. In fact, apart from some students re-sitting the entire grade who already knew the subject, some students proved capable of reasoning and dealing successfully with some problems of the pre-test. In the case of linear functions they might have learnt a few notions on the subject during middle school; in the case of quadratic functions they might have found analogies with previously studied concepts related to linear functions. Since "*every new thing that a person learns must be attached to what the person already knows*" (McLaughlin et al., 2005, p. 5), students should never be considered incapable of solving problems just because they have never dealt with them before in a regular school context. Furthermore, the results of the pre-test showed that nearly half of the students in each class had been graded the same grade. For this reason and in order to perfectionate the classification needed for the group formation a second test was added. This was a proper test on the prerequisites named "prerequisites test" regarding the initial knowledge for the learning objectives, as reported by the aforementioned *Indicazioni Nazionali per i Licei*. The questions within the test were organised in three specific cognitive domains: knowing, applying and reasoning. On the basis of the results of these two tests, the groups were formed according to the methods described in section 2.5.

Obviously, a single tool used to assess the students' knowledge - used in a precise temporal frame - cannot give exhaustive information on the necessary knowledge and the skills to successfully deal with a didactic unit; nevertheless, this was necessary to guarantee a certain level of objectivity and reproducibility of the current experimentations. Only in some specific cases the groups were modified, according to the indications of the teacher - a reliable informant on the class environment - and to the desires of the students themselves, expressed in a preliminary questionnaire (appendix B.1) in which they were asked to list three of their classmates with whom they would or they would not like to work. This choice was made in the hope to reduce any conflicts within the groups, being the students' at their first experience of cooperative work.

[36] For a detailed description of the two tests see sections 2.7.1 and 2.7.2.

2.2 Goal structure

In academic year 2010/2011, along with the upper secondary school Reform, the *Indicazioni Nazionali per i Licei*[37] came into effect, which are the reference for the design and the organisation of the goal structure of the educational experimentation in this research. More specifically, the parts of the document referred to are the *Profilo culturale, educativo e professionale dei Licei*[38], inserted as attachment A in the *Regolamento dei Licei*[39] (MIUR, 2010b), and the Indicazioni Nazionali per i Licei (MIUR, 2010c). These two documents "*costituiscono l'intelaiatura sulla quale le istituzioni scolastiche disegnano il proprio Piano dell'offerta formativa, i docenti costruiscono i propri percorsi didattici e gli studenti raggiungono gli obiettivi di apprendimento e maturano le competenze proprie dell'istruzione liceale e delle sue articolazioni*"[40] (MIUR, 2010c, p. 5). They take into account the results of the most relevant national and international surveys (such as INVALSI[41] and PISA-OECD[42]), in order to intervene on issues emerged both in schools and in the entry knowledge assessed through tests by Italian Universities. It is assumed that the natural (though not exclusive) development of the career of a Liceo student is University and that, along with the achievement of *competenze chiave di cittadinanza*[43] (MIUR, 2007), it is extremely important to prepare the learners adeguately in order to ensure the best possible career within their studies (MIUR, 2010c). More in detail, "*i percorsi liceali forniscono allo studente gli strumenti culturali e metodologici per una comprensione approfondita della realtà, affinché egli si ponga, con atteggiamento razionale, creativo, progettuale e critico, di fronte alle situazioni, ai fenomeni e ai problemi, ed acquisisca conoscenze, abilità e competenze sia adeguate al proseguimento degli studi di ordine superiore, all'inserimento nella vita sociale e nel mondo del lavoro, sia coerenti con le capacità e le scelte personali*"[44] (MIUR, 2010b, p. 4). Thus, didactic units of mathematics with the following requirements were designed and implemented: they were to be integrated in the classes' annual teaching plan; they were to be based on the goals established in the aformentioned documents; they were to be taught with a cooperative methodology[45].

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[37] The English translation for "*Indicazioni Nazionali per i Licei*" is "*National indications for Licei*". English translation by the author.

[38] The English translation for "*Profilo culturale, educativo e professionale dei Licei*" is "*Cultural, educational and vocational Profile for Licei*". English translation by the author.

[39] The English translation for "*Regolamento dei Licei*" is "*Regulations for Licei*". English translation by the author.

[40] *"Build up the framework on which school institutions design their Plan of Educational Offer, the teachers draw off their educational plan and the students achieve their learning targets and improve the competences typical of Liceo education".* English translation by the author.

[41] INVALSI = Istituto Nazionale per la VALutazione del SIstema educativo di istruzione e di formazione, is a research institute under the supervision of the Italian Public Education Department. Its main purpose is to evaluate the quality of the Italian school system, using quantitative methods tools and comparing the data against international standard parameters. Its main task is to develop tools to assess learning, at a National level, for the teaching of mathematics and Italian language. For more information see www.invalsi.it [Accessed January 1st, 2017].

[42] The Programme for International Student Assessment (PISA) is a triennial international survey which aims to evaluate education systems worldwide by testing the skills and knowledge of 15-year-old students. For more information see http://www.oecd.org/pisa [Accessed January 1st, 2017].

[43] The English translation for "*competenze chiave di cittadinanza*" is "*key competences for citizens*". English translation by the author.

[44] *"The education offered at Liceo provides the students with cultural and methodological instruments for a deep comprehension of reality, in order to let him/her confront rationally, creatively, with a planning and critical attitude, different situations, phenomena and problems, and acquire knowledge, skills and competences adequate to University studies, the social life and the workforce, and coherent with his/her personal skills and choices".* English translation by the author.

[45] For a detailed analysis of these activities see subsection 2.3.3.

With reference to the expected learning results at the end of any Liceo career as reported on the Profilo, the use of a social mediation method allowed the students to work specifically on the following logic-reasoning skills (MIUR, 2010b, attachment A, p. 2):

- Knowing how to support a personal opinion and how to listen to and critically evaluate others' opinions.
- Acquire the habits of thinking following a rigorous logic, identifying problems and propose potential solutions.
- Being able to read and critically understand the contents of different forms of communication.

As for the subject here treated (mathematics), the Indicazioni Nazionali are structured on three periods (first two-year period, second two-year period and fifth year[46]) and, for each of them, the topics to be treated are divided into four macro-areas: *arithmetic and algebra*; *geometry*; *relations and functions*; *data and forecasts*. The usual activities proposed by teachers on the "relations and functions" area have been sometimes substituted and sometimes integrated by the specific activities deriving from the experimentations of the research, focussing on the "linear functions" topic for the first two-year period and on the "quadratic functions" for the second two-year period. This research focused on the achievement of the following specific learning objectives and on some precise competences (described in the following subsection), on the aforementioned topic.

Specific learning objectives - "relations and functions" area (first two-year period)[47]

> *Obiettivo di studio sarà il linguaggio degli insiemi e delle funzioni (dominio, composizione, inversa, ecc.), anche per costruire semplici rappresentazioni di fenomeni e come primo passo all'introduzione del concetto di modello matematico. In particolare, lo studente apprenderà a descrivere un problema con un'equazione, una disequazione o un sistema di equazioni o disequazioni; a ottenere informazioni e ricavare le soluzioni di un modello matematico di fenomeni, anche in contesti di ricerca operativa o di teoria delle decisioni. Lo studente studierà le funzioni del tipo* $f(x) = ax + b$, $f(x) = |x|$, $f(x) = a/x$, $f(x) = x^2$ *sia in termini strettamente matematici sia in funzione della descrizione e soluzione di problemi applicativi. Saprà studiare le soluzioni delle equazioni di primo grado in una incognita, delle disequazioni associate e dei sistemi di equazioni lineari in due incognite, e conoscerà le tecniche necessarie alla loro risoluzione grafica e algebrica. Apprenderà gli elementi della teoria della proporzionalità diretta e inversa. Lo studente sarà in grado di passare agevolmente da un registro di rappresentazione a un altro (numerico, grafico, funzionale), anche utilizzando strumenti informatici per la rappresentazione dei dati.*

From the Indicazioni Nazionali per i Licei - "relazioni e funzioni" area (MIUR, 2010c, p. 271[48])

[46] Italian upper secondary school is a five-year cycle. The here mentioned "fifth year" corresponds to a "fourteenth grade".

[47] *"The learning objective is the language of sets and functions (domain, composition, inverse, etc.), in order to design simple representations of phenomena and used as a first step towards the introduction of the concept of mathematical model. The pupils will learn to describe a problem with an equation, an inequality or a system of equations or inequalities; to obtain information and acquire a solution for a mathematical model of phenomena, even in a context involving operational research or decisions theory. The pupils will study functions of the f(x) = ax + b, f(x) = |x|, f(x) = a/x, f(x) = x² type, both in mathematical terms and in order to describe and solve practical problems. They will learn to solve a linear equation with one variable, the associated inequalities and the systems of two linear equations with two variables, and will learn the techniques used to solve them graphically and algebraically. They will learn the theory of direct/inverse proportionality. Finally, they will be able to switch from one representational register to another (numerical, graphical, functional), aided also by digital instruments for the representation of data".* English translation by the author.

[48] These directions are explicitly referred to Linguistic Liceo, but they are exactly the same in the other attachments dedicated to other Liceo types.

Specific learning objectives - "relations and functions" area (second two-year period)[49]

Lo studente apprenderà lo studio delle funzioni quadratiche; a risolvere equazioni e disequazioni di secondo grado e rappresentare e risolvere problemi utilizzando equazioni di secondo grado. Studierà le funzioni elementari dell'analisi e dei loro grafici, in particolare le funzioni polinomiali, razionali, circolari, esponenziale e logaritmo. Apprenderà a costruire semplici modelli di crescita o decrescita esponenziale, nonché di andamenti periodici, anche in rapporto con lo studio delle altre discipline; tutto ciò sia in un contesto discreto sia continuo. Non sarà richiesta l'acquisizione di particolare abilità nella risoluzione di equazioni e disequazioni in cui compaiono queste funzioni, abilità che sarà limitata a casi semplici e significativi.

From the Indicazioni Nazionali per i Licei - "relazioni e funzioni" area (MIUR, 2010c, p. 272[50])

2.2.1 Didactic unit objectives

As Tomasi (2011) highlighted, the specific learning targets reported in the Indicazioni Nazionali are quite concise. Despite the vague suggestion of *"pochi concetti e metodi fondamentali, acquisiti in profondità"*[51] (MIUR, 2010c, p. 270[52]) - which is valuable, in a certain sense, as it gives the teachers a certain amount of freedom - the topics described are excessively generic and this could lead to an enormous variety of potential selections. At the same time, the educational observations provided by the document give way to too many interpretations, impossible to summarise in one method. Therefore, starting from the aforementioned specific learning objectives, the mathematical knowledge and the skills under scrutiny, have been detailed on the basis of the *Regolamento recante norme in materia di adempimento dell'obbligo di istruzione*[53] (MIUR, 2007) and organized as follows:

Didactic unit on linear functions

Knowledge

- Knowing the definition of function and the related concepts of domain, codomain and image.
- Knowing the potential representations of a generic function (verbal, numerical, graphic, functional).

[49] *"The pupils will learn to study quadratic functions, to solve quadratic equations and inequalities and to represent and solve problems using quadratic equations. They will study the elementary functions of analysis and of their graphs, especially the polynomial, rational, circular, exponential and logarithm functions. They will learn to design simple exponential growth and decay models and periodic trends, even combined with topics developed in other subjects; both in a discrete and in a continuum context. The acquisition of special skills in the solution of equations and inequalities presenting these functions is not included in this set, and it will be limited to simple and specific cases".* English translation by the author.

[50] See note 48.

[51] *"A few fundamental concepts and methods, learned thoroughly".* English translation by the author.

[52] See note 48.

[53] The English translation for "*Regolamento recante norme in materia di adempimento dell'obbligo di istruzione*" is "*Performance Rulebook of Compulsory Schooling*". English translation by the author. It is worth noting that in this document are listed only the contents related to linear functions, being part of the first two-year period syllabus (Compulsory Schooling in Italy ends with this period). Anyway, the contents for quadratic functions are here listed using the same structure.

- Knowing what a linear function is and its various representations.
- Knowing the relationships between the *m* and *q* coefficients and the graph of a linear function.
- Knowing the definition of zeros of a linear function.
- Knowing the definition of equation and solution of a linear equation.
- Knowing the definition of inequality and solution of a linear inequality.
- Knowing the meaning of studying the sign of a linear function.
- Knowing the meaning of a linear model of a problem.

Skills

- Discerning if a relation between two sets represents a function or not.
- Discerning and representing a generic function in different registers (numerical, graphical, functional).
- Discerning and representing the graph of a linear function.
- Being able to predict the position of the graph of a linear function.
- Switching from one representation register of a linear function to another (verbal, numerical, graphical, functional), even with the aid of technological instruments.
- Determining the zeros of a linear function with graphical and algebraic methods.
- Translating the geometric problem of researching the intersection points of a straight line with the horizontal axis into the algebraic problem of researching the zeros of the corresponding linear function and vice versa.
- Discerning if a value is the solution of a linear function.
- Discerning if a value is the solution of a linear inequality.
- Solving I degree linear equations and inequalities and the corresponding study of the solutions.
- Studying the sign of a linear function.
- Translating the geometric problem of studying the sign of a linear function into the algebraic problem of researching the solution intervals in the correspondent I degree linear inequalities and vice versa.

Didactic unit on quadratic functions

Knowledge

- Knowing what a quadratic function is and its possible representations (verbal, numerical, graphical, functional).
- Knowing the relationship among the *a*, *b* and *c* coefficients and the graph of a quadratic function.
- Knowing the definition of zeros of a quadratic function.
- Knowing the definition of equation and of solution of a quadratic equation.
- Knowing the definition of inequality and of solution of a quadratic inequality.
- Knowing the meaning of studying the sign of a quadratic function.
- Knowing the meaning of quadratic model of a problem.

Skills

- Discerning and representing the graph of a quadratic function.
- Being able to predict the position of the graph of a quadratic function.

- Switching from one representation register of a quadratic function to another (verbal, numerical, graphical, functional), even with the aid of technological instruments.
- Determining the zeros of a quadratic function with graphical and algebraic methods.
- Translating the geometric problem of researching the intersection points of a parabola with the horizontal axis into the algebraic problem of researching the zeros of the correspondent quadratic function and vice versa.
- Discerning if a value is the solution of a quadratic equation.
- Discerning if a value is the solution of a quadratic inequality.
- Solving II degree quadratic equations and inequalities and the corresponding study of the solutions.
- Studying the sign of a quadratic function.
- Translating the geometrical problem of studying the sign of a quadratic function into the algebraic problem of researching the solution intervals of the correspondent II degree quadratic inequalities and vice versa.

The aforementioned Regolamento (MIUR, 2007) is an important reference for the Indicazioni Nazionali because it describes the key knowledge and competences for citizenship - listed by the Ministry also referring to the 18 December 2006 recommendation of European Parliament and Council on the key competences for lifelong learning[54]. Actually, the description of knowledge and skills in the Regolamento is based on their definition in the 6 December 2006 proposition of the *European Qualification Framework*[55], according to which:

- *"Knowledge" means the outcome of the assimilation of information through learning. Knowledge is the body of facts, principles, theories and practices that is related to a field of work or study. In the context of the European Qualifications Framework, knowledge is described as theoretical and/or factual.*
- *"Skills" means the ability to apply knowledge and use know-how to complete tasks and solve problems. In the context of the European Qualifications Framework, skills are described as cognitive (involving the use of logical, intuitive and creative thinking) or practical (involving manual dexterity and the use of methods, materials, tools and instruments).*

In conclusion, the above listed explanatory framework can be held as valid, because both the Profilo and the Indicazioni are an actual development of the Regolamento. More in detail, in the Profilo *"[…] sono recepite pienamente le Raccomandazioni di Lisbona per l'apprendimento permanente e il Regolamento sull'obbligo di istruzione"*[56] (MIUR, 2010c, p. 7), as well as in the Indicazioni Nazionali it is highlighted that its final purposes "*assumono ampiamente alla fine del primo biennio di ciascun liceo quanto attualmente richiesto ai fini dell'assolvimento dell'obbligo di istruzione*"[57] (MIUR, 2010c, p. 5).

[54] The key competences for lifelong learning are published on the GU C 394 E, 30.12.2006, p. 10. [On-line] Available at: http://eur-lex.europa.eu/legal-content/IT/TXT/?uri=celex%3A32006H0962 [Accessed January 1st, 2017].
[55] This document was adopted by the European Parliament and Council during 2007 and was finally ratified in February 2008. Definitions of "*knowledge*" and "*skills*" from: GU C 111 E, 06.05.2008, Annex 1. [On-line] Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32008H0506(01) [Accessed January 1st, 2017].
[56] *"The Lisbon Strategy recommendations on lifelong learning and compulsory schooling are completely acknowledged".* English translation by the author.
[57] *"Widely receive at the end of the first two-year period what is now required to the fulfilment of compulsory schooling".* English translation by the author.

2.2.2 Competences

The definition for "competence" in the EQF[58] is:

- *"Competence" means the proven ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations and in professional and personal development. In the context of the European Qualifications Framework, competence is described in terms of responsibility and autonomy.*

Knowledge and skills, therefore, are a necessary but not sufficient requirement to acquire competences. This point is also confirmed in the introduction of the Indicazioni Nazionali where, along with the core elements of the document, the relationship between the specific learning objectives and the competences are described as follows: *"i due paragrafi su cui sono costruite le Indicazioni (competenze attese al termine del percorso e obiettivi specifici in itinere finalizzati al loro raggiungimento) chiariscono la relazione che deve correre tra contenuti e competenze disciplinari"*[59] (MIUR, 2010c, p. 8). It is worth noting that the Italian educational system is traditionally characterised by a clear separation among subjects. The Indicazioni Nazionali themselves are organized by subjects; this *"mira ad evidenziare come ciascuna disciplina - con i propri contenuti, le proprie procedure euristiche, il proprio linguaggio - concorra ad integrare un percorso di acquisizione di conoscenze e di competenze molteplici, la cui consistenza e coerenza è garantita proprio dalla salvaguardia degli statuti epistemici dei singoli domini disciplinari, di contro alla tesi che l'individuazione, peraltro sempre nomenclatoria, di astratte competenze trasversali possa rendere irrilevanti i contenuti di apprendimento"*[60] (MIUR, 2010c, p. 8). Therefore, while the reorganisation of knowledge and skills in the specific learning objectives was not particularly difficult, the insertion of competences raised some peculiar issues.

European Competences	1. Communication in the mother tongue. 2. Communication in foreign languages. 3. Mathematical competences and basic competences in science and technology. 4. Digital competence. 5. Learning to learn. 6. Social and civic competences. 7. Sense of initiative and entrepreneurship. 8. Cultural awareness and expression.

Table 1: Key competences for lifelong learning[61]

The Italian alignment to the EU recommendations on key competences for lifelong learning (table 1) - ratified in Italy in the Regolamento for compulsory schooling (MIUR, 2007) - introduced twenty-two different competences, defined core competences and classified along four cultural axes (table 2) and key citizenship competences (table 3).

[58] Definition of "*competence*" from: GU C 111 E, 06.05.2008, Annex 1. [On-line] Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32008H0506(01) [Accessed January 1st, 2017].

[59] *"The two paragraphs on which the Indications are founded (competence required at the end of the period and specific ongoing objectives aimed to its fulfilment) clarify the relationship between content and competence of a subject".* English translation by the author.

[60] *"Aims to highlight how each subject - with its contents, its own heuristic procedures, its own language - supports the integration of a process of knowledge and multiple competences acquisition , whose consistence and coherence is granted by the preservation of the epistemic statutes of each subject, as opposed to the thesis, still related to the nomenclature, according to which the identification of abstract transversal competences makes the learning content irrelevant".* English translation by the author.

[61] See note 54.

Core competences	
Language axis	1. Mastering Italian language. 2. Use of a foreign language for basic communicative and operational purposes. 3. Fundamentals for a responsible use of artistic and literary heritage. 4. Use and production of multimedia texts.
Mathematics axis	1. Use of techniques and procedures of arithmetic and algebraic calculus and their graphical representation. 2. Comparing and analysing geometric figures, identifying invariants and relations. 3. Identifying proper strategies to solve problems. 4. Analysing and interpreting data, developing deductions and reasoning with the aid of graphic representations, responsible use of calculators and computer applications.
Scientific-technologic axis	1. Observing, describing and analysing natural and artificial phenomena, identifying the concepts of system and complexity. 2. Qualitative and quantitative analysis of phenomena related to energy transformations, starting from experimental experiences. 3. Knowing the potentiality and the limits of technology in the cultural and social context in which they are applied.
Historical and social axis	1. Understanding the changes and the diversity of historic periods diachronically by comparing different ages, and synchronically, confronting different geographic and cultural areas. 2. Relating personal experience to a system of rules based on the mutual recognition of rights guaranteed by the Constitution in the safeguard of the individual, the community and the environment. 3. Recognising the bases of the socio-economic system, in order to be directed in understanding the productive fabric of the environment.

Table 2: Core competences

Core competences are strictly related to four conceptual macro-areas divided by subject, which clash with the transversal tone of the European competences. Moreover, despite being the core competences more than twice as many as the European competences, it was impossible to match all of them to the key citizenship competences due to their connotation. Therefore, MIUR added eight further key citizenship which the teacher is not bound to assess and which are considered automatically acquired when the pupils fulfil sixteen competences[62] of the register for the accomplishment of compulsory schooling (MIUR, 2010a).

[62] These sixteen competences are actually the fourteen core competences, where the first one of the linguistic axis (*"Mastering the Italian language"*) is split into the following three competences: *"mastering the expressive and dialectic instruments necessary for the verbal communicative interaction in different contexts"*; *"reading, understanding and interpreting different types of written texts"*; *"production of different types of texts in relation to different communicative purposes"*.

Key citizenship competences	1. Learning to learn. 2. Planning. 3. Communicating. 4. Cooperating and participating. 5. Acting autonomously and responsibly. 6. Problem solving. 7. Identifying links and relations. 8. Acquiring and interpreting information.

Table 3: Key citizenship competences

While the Regolamento completes its function at the end of the first two-year period, the Profilo and the Indicazioni extend their action to the entirety of the five year span of upper secondary school. Nevertheless, their entering into force has not changed much.

The Profilo does not adopt the classification divided into knowledge, skills and competence, but, as previously stated, it reports the learning results common to all Liceo curricula divided into five areas: *metodologica; logico-argomentativa; linguistica e comunicativa; storico umanistica; scientifica, matematica e tecnologica* [63] (MIUR 2010b, attachment A).

The Indicazioni Nazionali report for each subject the "*linee generali e le competenze*"[64] to be fulfilled at the end of upper secondary school. Once again metacognitive (learning to learn), relational (team work) and attitudinal (autonomy and creativity) competences are *"non escluse dal processo, ma ne costituiscono un esito indiretto, il cui conseguimento dipende dalla qualità del processo stesso attuato nelle istituzioni scolastiche"*[65] (MIUR, 2010c, p. 8). Having to conform to this normative frame, the first step was to identify topic and subject related competences, that is linear and quadratic function, in order to insert them into the goal structure.

From the analysis of the "linee generali e le competenze" for mathematics of each curriculum for Liceo, a dominant theme was noted: the mathematical model (Tomasi, 2016, p. 365). Actually, The Indicazioni highlight how "*al termine del percorso dei licei classico, linguistico, musicale coreutico e della scienze umane lo studente conoscerà i concetti e i metodi elementari della matematica, sia interni alla disciplina in sé considerata, sia rilevanti per la descrizione e la previsione di semplici fenomeni, in particolare del mondo fisico"*[66] (MIUR, 2010c, p. 269[67]). Furthermore, among the groups of concepts and methods to be acquired by the pupils at the end of upper secondary school, the following aspects are highlighted (MIUR, 2010c, p. 269, points 5 and 6):

- *il concetto di modello matematico e un'idea chiara della differenza tra la visione della matematizzazione caratteristica della fisica classica (corrispondenza univoca tra matematica e natura) e quello della modellistica (possibilità di rappresentare la stessa classe di fenomeni mediante differenti approcci)*[68].

[63] "*Method*; *logic-argumentation*; *language and communication*; *history and humanities*; *science, mathematics and technology".* English translation by the author.
[64] "*General concepts and competences*". English translation by the author.
[65] *"Not excluded in this project, but representing one if its indirect outcomes, which achievement depends on the quality of the project itself in the application by individual schools".* English translation by the author.
[66] *"At the end of the five years of Classical, Linguistic, Music and Dance and Human Sciences Liceo the pupils will know the concepts and basic methods of mathematics, both those internal to the subject as it is, and those relevant to the description and prevision of simple phenomena, especially in the physical world".* English translation by the author.
[67] See note 48.
[68] *"The concept of mathematical model and a clear idea of the difference between the concept of mathematics in classical physics (univocal correspondence of mathematics and nature) and the one of modelistics mathematics (possible representation of the same class of phenomena with different approaches)".* English translation by the author.

- *costruzione e analisi di semplici modelli matematici di classi di fenomeni, anche utilizzando strumenti informatici per la descrizione e il calcolo*[69].

This topic is surely new in the mathematics syllabus for upper secondary school. Its practical application requires time which is not compatible with the three hours per week (two in the second three-year period) allocated by the ministry (Tomasi, 2011).

In the wake of these considerations, it was decided to work on the two topics in exam – both part of the thematic area "relations and functions" – in order to develop only one competence related to the concept of mathematical model, respectively in the linear and in the quadratic case. This competence could be summarized as follows: *recognising in the concept of (linear or quadratic) function an instrument enabling the comprehension of phenomena of reality through an objective study of the numerical relations involved*.

This assumption was adapted to the actual context in the schools; it is worth remembering that, as Serrano and Pons (2011) noted, a competence has also to answer the question: "Why and what is it useful for?", in order to enable the pupils to give a meaning to what they are learning (see "why?" section in table 4).

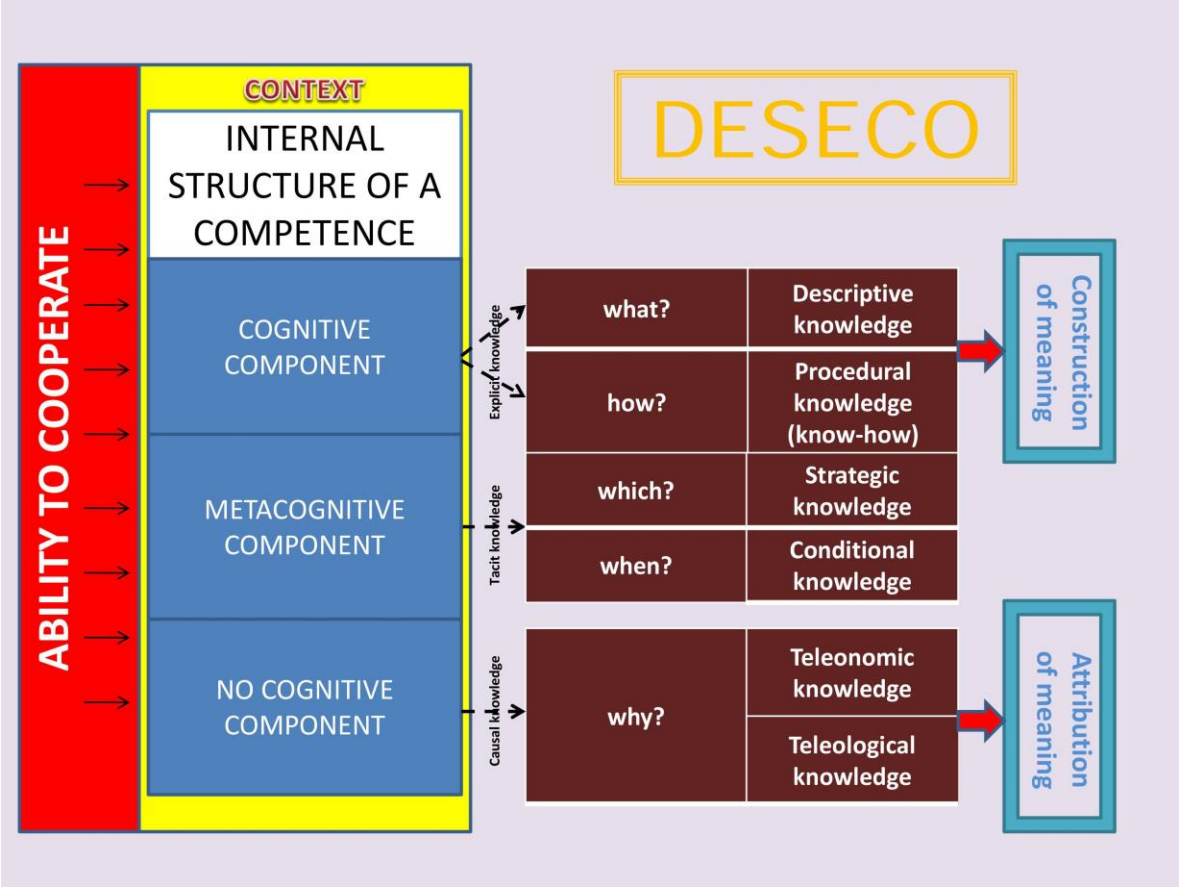


Table 4: Internal structure and conditions of a competence

[69] *"Construction and analysis of simple mathematical models of classes of phenomena, also aided by digital instruments for description and calculus".* English translation by the author.

During the didactic interventions here analysed, the competences were contextualised according to the curricula, as suggested in the Indicazioni Nazionali: as for Linguistic Liceo, the competences concern the "*ruolo dell'espressione linguistica nel ragionamento matematico"*[70]. In Human Science Liceo, these competences are linked to *"visione critica del ruolo della modellizzazione matematica nell'analisi dei processi sociali"*[71] (MIUR, 2010c, p. 270[72]).

Broadly speaking and beyond the mathematic field, the employment of Peer Education methods has as the prefixed target - subject of a specific training (see for example Cohen, 1999) and of a final grading of its own (on this issue in Italian school see Pesci, 2003; 2004; 2011; Pesci et al., 2015) - of developing extra-disciplinary competences which, in this study, can be related to the key citizenship competences and to the transversal competences (metacognitive, relational and attitudinal) as reported in the Indicazioni Nazionali. Nevertheless, due to time limits of the experimentation in object (two months), the analysis of these aspects are postponed to future researches on annual surveys (for more information, see project: "*Learning Maths Together!*" scheduled for the 2016/2017 school year by the Liceo Ariosto in Ferrara, Italy).

It is also worth noting that, due to the presence in some classes of students with learning disabilities, their personalized didactic plans (PDP) were examined. As no significant changes on the above mentioned learning objectives and competences were observed, the same goal structure was assigned to those students.

2.3 Task structure

2.3.1 Management roles

In every team four management roles were introduced, each of them having specific functions, inspired by those formulated by Johnson, Johnson and Holubec (1996, pp 53-55). Such roles rotated at the end of each activity so that each student could focus on single tasks and gradually train different studying skills, such as reading, writing, oral presentation, etc.

The teams with students with learning disabilities were not assigned tasks difficult to execute, e.g. reading texts to dyslexic students. Furthermore, as suggested by the Italian law no. 170 (MIUR, 2010d), specific exonerative measures were applied and they were allowed to use compensatory instruments throughout the entire project.

The roles of mediator and reader were given to the same person in case a team was formed of three students or in case one of them was absent.

The roles were merged into reader-mediator and writer-presenter in case two members were absent.

[70] *"To the role of linguistic expression of mathematical language".* English translation by the author.
[71] "*To a critical view of mathematical modelling in the analysis of social processes".* English translation by the author.
[72] See note 48.

Role	Functions
Reader	Reads the assignments (enunciates aloud the different tasks).
	Explains the assignments (and/or parts of the assignment which are unclear to the other team members).
Mediator	Directs the debate (making sure the other team members do not interrupt each other) and encourages participation (making sure that all the team members contribute to the debate).
	Controls the turns (making sure the team members perform their task according to the prearranged turns).
Writer	Synthetises (summarising the ideas and the reasonments of the team debate through clear and systhematic sentences).
	Records the decisions (writing down on the worksheet the decisions of the team).
Presenter	Summarises (orally summarising what has been read and discussed by the team and the conclusions that have been found).
	Presents (introducing the conclusions elaborated by the team in the class debate).

Table 5: Management roles

By looking at the functions described above, some doubts on the reasons why these functions were used in every class could arise, together with the already assigned tasks characterising each interactive structure. Are there any differences among them? For this research, being all the participants unexperienced in using Peer Education methods, the adoption of management roles in every class was considered fundamental as "*è uno dei modi più efficaci per assicurarsi che il lavoro di gruppo sia agevole e produttivo"*[73] (Johnson, Johnson and Holubec, 1996, p. 56). Such functions do not refer to the roles recalled within the equality parameter, instead they are mostly concerned with the control of the socio-relational field. In fact, with reference to the dual polarity (subject – socio-relational) characterising our theoretical framework, while at the beginning the management and learning functions seem different, over time *"ruoli sociali e cognitivi si fondono"*[74] (therein, 1996, p. 56).

After all, it is known that the five elements listed at the beginning of this chapter are highly interdependent, and so far many of the researches have analysed only the individual effects of each factor (Pons et al., 2014). Being the purpose of this research an inter-parametrical investigation, the same structure for the three modalities was considered, being these management roles highly influential on the task structure, as shown later.

2.3.2 Preparatory tasks

During the preliminary phase some activities from Comoglio (1999, p. 106) were used, in order to instruct the students on the difficulties likely to occur while working in team and how to face them by carefully managing the aforementioned roles and the team members' behaviour. These activities are not strictly related to a specific subject, but they aim to favour a serene and open debate

[73] *"It is one of the most efficient ways to ensure the teamwork to be easy and productive".* Re-translation from Italian by the author.
[74] *"Social and cognitive roles merge".* Re-translation from Italian by the author.

environment; therefore, they can be used in the introduction of any teamwork. Ideally, a decent amount of time should be devoted to socio-relational skills activities before starting any Peer Education method based didactic unit. In the case of this work, however, due to administrative reasons related to the availability of the teachers, only two hours per class were allotted to the activities.

Another preliminary activity aimed to fill the prerequisite gaps was planned, in order to:

1. Fill the most evident gaps emerging from the prerequisite test.
2. Ease the students from socio-relational skills based activities field into subject based ones.

This activity was repeated in each class, focusing on the topics on which more than one third of the students failed to pick the right answer. The teams were asked to further reason the questions out according to the following strategy:

Phase	Who	Beginning	End	Target
Reading of the question	- Reader: enunciates aloud the problem. - EVERYONE listens.	When all the members are ready to begin the activity.	When all the members have understood the task.	Understanding the problem.
Team debate	- Mediator: supervises the debate trying to get all the members involved and aiming to a common agreement. - EVERYONE has to state his/her own opinion and wait for his/her turn to speak.	The debate is open when the entire team has understood the assigned task.	When a common agreement on how to solve the problem is arranged.	Planning a working strategy.
Writing	- Writer: registers the conclusions of the team debate. - EVERYONE has to take part to formulate the final answer and control if what is being written is correct.	The resolving process and the final answer to the question are transcribed only when a final agreement in the team debate phase has been reached.	When the entire team has checked if the process and the answer are written correctly.	Development of the working plan and arrangement of a solving conclusion to the problem assigned.
Preparation to the class debate	- Presenter: orally summarises the previous phases and ensures that all the team members acknowledge what has been done. - EVERYONE listens to the presenter in order to avoid potential imprecisions.	At the end of the writing phase the different steps of the work are orally summarised, in order to present an overview of the entire activity.	When an agreement on the entire process is confirmed and the team is ready to share its results with the entire class.	Verifying and summarising the conclusions.

Table 6: Description of the different activities phases

This procedure stems from by Polya's resolution scheme exposed in his well-known book *How to solve it* (1957, pp. xvi, xvii) and from some considerations on the importance of the work on metacognitive skills (Schoenfeld, 1983a; 1983b; 1987). The strategy was also used in many of the subsequent activities and it is, therefore, an integral part to the task structure of the project.

2.3.3 Didactic activities

The didactic activities of both experimentations were planned highlighting the relationship among the different representative registers[75] of the functions. Many of the tasks were set up as exploring activities, as suggested by Polya (1954), who states it is necessary to make the student feel comfortable so as to ask questions and solve the related problems autonomously, from the initial conjectures to the final construction of mathematical demonstrations, with a suitable degree of complexity.

Ten didactic worksheets were specially designed for each experimentation, organizing content and process schedules as following:

Experimentation on linear functions

Activity	**Topic**	**Hours of work**
1	Concept of function	2 hours
2	Introductive problem on phone network tariffs	1 hour
3	Algebraic representation of linear functions: analysis of m and q coefficients	2 hours
4	The zeros of a linear function	1 hour
5	Solving procedures for 1st degree equations	2 hours
6	1st group test	1 hour
7	Problems from real life	1 hour
8	Studying the sign of a linear functions	2 hours
9	Solving procedures for 1st degree inequalities	3 hours
10	2nd group test	1 hour

Table 7: Didactic structure of the experimentations on linear functions[76]

[75] For a further clarification of the different linguistic registers of mathematics see section 8.5 in *Elementi di Didattica della Matematica* (D'Amore, 1999).
[76] The complete texts of the activities are in appendix C.1.6.

Experimentation on quadratic functions

Activity	Topic	Hours of work
1	Introductive problem on braking distance	2 hours
2	Algebraic representation of quadratic functions: analysis of a, b and c coefficients	2 hours
3	Vertex and axis of symmetry of a parabola	1 hour
4	The zeros of a quadratic function	1 hour
5	Solving procedures for 2nd degree equations	2 hours
6	1st group test	1 hour
7	Problems from real life	1 hour
8	Studying the sign of a quadratic function	2 hours
9	Solving procedures for 2nd degree inequalities	2 hours
10	2nd group test	1 hour

Table 8: Didactic structure of the experimentations on quadratic functions[77]

The structure of these activities is inspired by some methods described by Kagan et al. (2004). More specifically, the *roundtable* structure in the agreement mode has been followed to organise eight of these activities (number 1, 2, 3, 4, 5, 7, 8, 9). In this case, the students were asked to solve some problems by following the procedure already used in the revision of prerequisites test. The lessons where arranged as follows (except for the session of work within the groups):

- Introduction by the teacher: overview of the lecture; summary on the results achieved in the previous activities; checking homework. This session involved the entire class.
- Team work sessions:
  - In A_{ij} classes, using the peer collaboration model, the students were given a worksheet with the activities for the day. They chose their roles and started work replicating the usual procedure. In no case they could split their tasks as they had to work simultaneously on the same activity.
  - In B_{ij} classes, using the cooperative learning model, the students were given a worksheet with the activities for the day. They chose their roles and started work replicating the usual procedure. They could split their tasks for certain activities only[78], though they were compelled to share their results with the other team members at the end of the work.
  - In C_{ij} classes, using the peer tutoring model, the four management roles were adopted anyway, in order to ensure a sequential and organised management of the different tasks. Therefore the students, after receiving their worksheet with the activities, chose

[77] The complete texts of the activities are in appendix D.1.6.

[78] More specifically, this concerns some parts of the activities no. 1, 4, 5, 8 and 9 of the linear function didactic unit and the activities no. 1,2,4,5, 8 and 9 of the quadratic function didactic unit.

their roles and started work replicating the usual procedure. Moreover, the students in these classes were also supposed to fulfil the assigned fixed roles of tutors and tutees. Being their first experience, a strict protocol to follow was avoided, but the following recommendations[79] were advised:

Tutors	Tutees
Provide clear further explanations to the tutees when asked;	Ask further explanations to the tutors when needed;
Show the correct execution of tasks difficult for the tutees;	Attentively follow the instructions of the tutors on the correct execution of potentially difficult tasks;
Lead the tutees to the imitation of resolving procedures;	Try and imitate the resolving procedures as suggested by the tutors;
Ensure that the tutees are able to perform the task without external help;	Try and solve autonomously difficult tasks;
Give feedback on the work, avoiding severe reprimands and sincerely praising when deserved	Listen to the tutors' feedback, in order to improve and to be aware of the results achieved.

Table 9: Tutors/tutees' scheme

- Class debate: oral exposition by the presenters of the results achieved by each team and formalization of the knowledge gained during the work by the teacher, in order to draw an end of the activity summary.
- E-mailing of the teaching material used during the lesson with the related explanations, along with some revision homework to be completed for the following session.

The remaining two activities (number 6 and 10), located at the half and at the end of the project, derive from the *team statements* structure and are specially designed as formative assessment. These activities have two phases: in the first phase each student is given a worksheet with exercises on the topics previously dealt with on which he/she has to work individually for a certain amount of time. Only during the second phase they are allowed to compare their views with the other team members, in order to find and clear up any possible doubts before handing the worksheet in. These two activities are aimed not only to monitor the students' learning process (no other forms of halfway grading, such as oral tests, were planned), but also to convey the idea that team work is not purposeless – as students often think, especially when it is used sporadically and not consistently – and that it involves shared responsibilities which, in the long run, will let them achieve common success or failures.

In the light of some previous studies (Pesci, 2004), the students were not given any worksheet on team members' interpersonal relationships observation.

This choice, supported by the existing literature (Stead, 2005; Marin-Garcia and Lloret, 2008), was made in order not to weigh down the work structure and to avoid any tension inside the teams, as students usually develop some form of anxiety when asked to judge their classmates (Hsiung, Luo and Chung, 2014). The analysis of the performance achieved in the team tests was adopted as a means to identify potential difficult cases (Hsiung, 2010): if some groups, at the end of the tests, scored

[79] These functions were partially inspired by a simple model of direct education described by Topping and Wolfendale (as quoted in Topping, 2014, p. 55).

average or below average results, the potential issues would be found using individual and collective planned discussions.

Finally, in the work session following activity no. 10, every class had to go through an individual final evaluation test on the learning objectives of the entire didactic unit, structured to be completed in an hour.

As for grading students with learning disabilities "*adeguate forme di verifica e di valutazione*"[80] (MIUR, 2010d, art. 5) were guaranteed. More specifically, compensative tools were introduced (e.g. mainly calculators, formulae sheets and mind maps), while keeping the tests with their original content. In addition, the texts format and the structure were modified (Verdana font with size 16, capital letters, non-justification of the text, bigger spacing, etc.) allowing the students to have 30% additional time to complete their test.

2.4 Reward structure

In the academic environment is widely known that the reward structure maximising positive interdipendence is the one connecting a student's assessment to his/her teammates' (Serrano and Pons, 2007). Despite knowing that having group goals significantly affects both the attitude towards the work and the students' learning process (Slavin, 1990; Serrano, González-Herrero and Pons, 2008), some teachers were very doubtful about this grading method. Therefore, an 80-20 type compromise was agreed for the reward structure, by valuing more (80%) the individual grading of each student in the final test, adding a 20% of the grading scored by their teams in activities 6 (10%) and 10 (10%). The students involved had never worked until then on a reward structure linked – though minimally – to extra-individual factors. In the light of this situation, this research excludes additional grading criteria – e.g. interaction or self-grading process, etc. – which were not strictly related to the didactic aspect.

2.5 Group formation criteria

For each class the students were firstly ranked in ascending order according to the grade obtained in the pre-test. Then, those who had the same grade where also ranked in ascending order according to the grade obtained in the prerequisite test. Starting from this ranking, the following group formation rules were applied:

If we call n the number of students of a general 1st, 2nd or 3rd grade in any upper secondary school, on the basis of the existing laws[81] regulating the school system, we will see that $20 \leq n \leq 30$. Therefore:

[80] *"Adequate forms of testing and grading".* English translation by the author.

[81] The amount of students per class is established by the Decree of the President of the Italian Republic 20 March 2009, n.81 (MIUR, 2009). The provisions related to the formation of initial classes (the 1st class in our case) and intermediate (in our case 2nd and 3rd classes) in upper secondary schools, are included in articles 16 and 17: the minimum amount of students accepted in initial and intermediate classes is respectively of twenty-seven and twenty-two, whereas the highest number is always thirty, in any case (apart from possible exceptions - see article 4, paragraph 1). Indeed, paragraph 84 of Law 107 (MIUR, 2010d) establishes that "*the school headmaster, within the assigned autonomy limits, the staff and the available resources (also logistic), shall reduce the number of pupils and students per each class, according to what*

- If n was a multiple of 4, then, considering $n = 4k$, with $k \in N$, we used the following criteria:
    - *peer collaboration*: starting from the bottom of the ranking, the final groups were just made considering four consecutive members until reaching the top.
    - *cooperative learning*: starting from the bottom of the ranking, the students were numbered from 1 to k until reaching the top. Then, all the students associated with the same number were put together in the same group.
    - *peer tutoring*: starting from the bottom of the ranking, temporary groups of two consecutive members were made until reaching the top. Then, this list of pairs was divided into two blocks, one containing the first k pairs $(1, 2, \dots, k)$, the other one containing the k remaining pairs $(k+1, k+2, \dots, 2k)$[82]. Considering this order, the final groups were made taking from the first block - called the tutees' block - the first pair (numbered 1) was assigned to the first pair (numbered $k+1$) of the second block - called the tutors' block - and so on to the end of the matches. In this mode there was the smallest possible difference between the averages of the tutees pairs and the associated tutors pairs.
- If n was not a multiple of 4, we formed groups both of three and four students considering the highest amount of groups of four that is possible to form. In order to do this, we made this general reasoning:
    - As n is not a multiple of 4, then $n = 4q + r$, where q is the quotient and r the reminder of the division of n by 4. The reminder of the division, say r, could be 1, 2 or 3.
    - We want to determine the highest number of groups of four, say j, that can be formed. In order to do this, we subtract the lowest multiple of 3, say $3h$, with $h \in N$, from n in such a way that $n - 3h$ is a multiple of 4. As r could be 1, 2 or 3 we have to consider three different possibilities:
        - **if $r = 1$**, we want to find the lowest h such that $1 - 3h$ is a multiple of 4. This comes from the following: $n = 4q + 1 \Rightarrow n - 3h = 4q + (1 - 3h)$.

          Thus, to have $n - 3h$ as a multiple of 4 we want $1 - 3h$ to be a multiple of 4 too. Clearly, the desired value of h is 3. Therefore, j will be:

          $$n - 3h = 4q + (1 - 3 * 3) \Leftrightarrow n - 3h = 4q - 8$$

          $$\Leftrightarrow n - 3h = 4(q - 2) \Rightarrow j = q - 2$$

          Example: $n = 25$. Having $25 = 4 * 6 + 1$, there will be three groups of three and four groups of four.
        - **if $r = 2$**, we want to find the lowest h so that $2 - 3h$ is a multiple of 4. This comes from the following: $n = 4q + 2 \Rightarrow n - 3h = 4q + (2 - 3h)$. Thus, to have $n - 3h$ as a multiple of 4 we want $2 - 3h$ to be a multiple of 4 too. Clearly, the desired value of h is 2. Therefore, j will be:

established by the above mentioned Decree of the President of the Italian Republic 20 March 2009, no. 81, with the goal of improving the quality of teaching, and also based on the educational needs disabled students have".

[82] This criterion, applied to four people groups stems from Topping's suggestions on the formation of only tutoring couples, therefore "*during the first education cycle … it could be useful to order pupils based on their performance in the tutees subject area, then to mark a line half way through the list, and finally appoint the pupils in the higher half as tutors and the ones in the lower part as tutees students; the best tutor will be associated with the best tutees student, and so on and so forth*" (2014, p. 42). Re-translation from Italian by the author.

$$n - 3h = 4q + (2 - 3 * 2) \Leftrightarrow n - 3h = 4q - 4$$

$$\Leftrightarrow n - 3h = 4(q - 1) \Rightarrow j = q - 1$$

Example: $n = 26$. Having $26 = 4 * 6 + 2$, there will be two groups of three and five groups of four.

- **if $r = 3$**, we want to find the lowest h so that $3 - 3h$ is a multiple of 4. This comes from the following: $n = 4q + 3 \Rightarrow n - 3 * h = 4q + (3 - 3h)$. Thus, to have $n - 3h$ as a multiple of 4 we want $3 - 3h$ to be a multiple of 4 too. Clearly, the desired value of h is 1. Therefore, j will be:

$$n - 3h = 4q + (3 - 3 * 1) \Leftrightarrow n - 3h = 4q => j = q.$$

Example: $n = 27$. Having $27 = 4 * 6 + 3$, there will be a group of three and six groups of four.

In any case, we will always have $q + 1$ total groups. In order to make them, we used the following criteria:

- **if $r = 1$**, j groups composed of four members and three groups composed of three members were formed according to these rules:
  - *peer collaboration*: starting from the bottom of the ranking, the final groups were just made considering four consecutive members until reaching the top. The only three groups of three students were made with the last nine students on the top of the ranking, each group taking the three consecutive students following the initial ranking.
  - *cooperative learning*: starting from the bottom of the ranking, the students were numbered from 1 to $q + 1$ until reaching the top. Then, all the students associated with the same number were put together in the same group.
  - *peer tutoring*: starting from the bottom of the ranking, temporary groups of two consecutive members were made until reaching the top, without considering the last three students. Then, this list of pairs was divided into two blocks, one containing the first $q + 1$ pairs $(1, 2, \dots, q + 1)$, the other one containing the $q - 2$ remaining pairs $(q + 2, q + 3, \dots, 2q - 1)$ and the three last tutors separated. Considering this order, the final groups were made taking from the first block - called the tutees' block - the first pair (numbered 1) was assigned to the first pair (numbered $q + 2$) of the second block - called the tutors' block - and so on until the end of the matches, where the third-last, the second-last and the last pair of the first block (numbered $q - 1$, q and $q + 1$) were respectively assigned to the third-last, second-last and the last tutor of the second block.
- **if $r = 2$**, j groups made up of four members and two groups made up of three members were formed according to the following rules:
  - *peer collaboration*: starting from the bottom of the ranking, the final groups were just made considering four consecutive members until reaching the top. The only two groups of three students were made with the last six students on the top of the ranking, taking the first three into one, and the remaining into the other one.

- *cooperative learning*: starting from the bottom of the ranking, the students were numbered from 1 to $q + 1$ until reaching the top. Then, all the students associated with the same number were put together in the same group.
- *peer tutoring*: starting from the bottom of the ranking, temporary groups of two consecutive members were formed until reaching the top; this time the last pair was split down, so that we could consider two tutors alone instead of a tutors pair. Then, this list of pairs was divided into two blocks, one containing the first $q + 1$ pairs $(1, 2, \dots, q + 1)$, the other one containing the $q - 1$ remaining pairs $(q + 2, q + 3, \dots, 2q)$ and the two last tutors separated. Considering this order, the final groups were made taking from the first block - called the tutees' block - the first pair (numbered 1) was assigned to the first pair (numbered $q + 2$) of the second block - called the tutors' block - and so on until the end of the matches, where the second-last and the last pair of the first block (numbered q and $q + 1$) were respectively assigned to the second-last and the last tutor of the second block.

- **if $r = 3$**, j groups composed by four members and one group composed by three members were formed according to these rules:
  - *peer collaboration*: starting from the bottom of the ranking, the final groups were formed just considering four consecutive members until reaching the top. The only one group of three students was formed with the last three students from the top of the ranking.
  - *cooperative learning*: starting from the bottom of the ranking, the students were numbered from 1 to $q + 1$ until reaching the top. Then, all the students associated with the same number were put together in the same group.
  - *peer tutoring*: starting from the bottom of the ranking, temporary groups of two consecutive members were made until reaching the top, where it was remaining just one student alone. Then, this list of pairs was divided into two blocks, one containing the first $q + 1$ pairs $(1, 2, \dots, q + 1)$, the other one containing the q remaining pairs $(q + 2, q + 3, \dots, 2q + 1)$ and the last student alone. Considering this order, the final groups were made taking from the first block - called the tutees' block - the first pair (numbered 1) which was assigned to the first pair (numbered $q + 2$) of the second block - called the tutors' block - and so on until the end of the matches, where the last pair of the first block (numbered $q + 1$) was assigned to the last student of the second block.

2.6 Observation scheme of the mutuality parameter

Since the mutuality parameter needed to be quantified for the subsequent statistical research, we immediately discussed what methodology to apply to analyse the verbal interactions among students during group activities. Several approaches are suggested from the field of linguistics, antropology, sociology and human sciences for the observation of these dynamics and some of them have been employed in studies on didactics of mathematics (Bauersfeld, 1988). Yet, we need to be aware that the observation of the teaching-learning procedures in mathematics must be based on methodologies which, at the same time, analyse the interaction process and the object of knowledge at stake (Seeger, 1991). As for this aspect, we agree with Bartolini Bussi and Bori (1995) in considering the taught-

learned object from Vygotsky's viewpoint, not simply as plain content, but as the result of the "*attività svolta collettivamente dall'insegnante e dagli allievi … determinata sia dalle caratteristiche del compito (legate ai contenuti) che dalle caratteristiche dell'interazione*"[83] (therein, p. 224).

In order to evaluate the mutuality parameter we started from the analysis of the recent index observation scheme proposed and validated by Pons et al. (2012). This tool allows for a detailed analysis of the interaction processes among peers on the topics of psychology and pedagogy within the University environment, but, for the moment, *"no permiten generalizar los resultados a otros niveles educativos y/o a otras disciplinas universitarias"*[84] (therein, 2012, p. 94). Therefore, we tried to adapt this scheme to the case of a "*mathematical discussion*" among peers, as defined by Pirie and Schwarzenberger (1988) and as previously described in our theoretical framework. Only four, out of six factors contained in the original 2012 version, have been considered; from this, twelve associated categories have been targeted, selected and modified.

There are several reasons linked to the choice of these specific items:

- The students needed to be shown the attitude and the behaviour on which they had to focus during the activities. Therefore, we thought not to overload them with too many responsibilities, to avoid possible misunderstandings and bad functioning in the group work.
- We preferred to focus on behaviours which had already shown as meaningful in previous studies on group discussions focused on mathematical topics.
- We wanted to focus our attention on those specific categories of a learning activity rather than on the activities related to group processes, since one of the objectives of the experimentation is the search for a possible correlation between the parameter mutuality and the performance in the subject, at the end of the cooperative activity.

Hereinafter, the selected items are described in detail[85] with the relative observations:

Factor 1. Formulation of one's own point of view

1. On the learning activity

1. (1) Expressing the understanding of the activity, task and assignment during the approach, process and production steps.

2. (4) Taking into consideration others' opinion.

3. (5) Accepting and respecting the decision taken by the group, on the obtained result.

2. In relation to the group process

None.

As shown by Pons et al. (2012, p. 94), the formulation of one's own opinion is one of the factors which explains most of the variance percentage of the factorial analysis in their experimentation. Given its importance, we decided to consider three of the relative categories on the learning activities. Verbalizing the understanding of the assignment, in its initial, process and production steps, is certainly one of the systems on which learning is based, within a peer interaction, especially in mathematical discussions (Webb et al., 2006). At the same time, taking into account the others'

[83] "*Activity carried out collectively by the teacher and the pupils … determined by the characteristics of the task (connected to the content), as well as by the characteristics of the interactions*". English translation by the author.

[84] *"does not allow to generalize the results obtained within other school levels and/or University modules".* English translation by the author.

[85] The items described above can be compared to the original ones, cited in the article (Pons et al., 2012), using the numeration in brackets.

considerations and trying to reach a final shared decision on the objective to reach, is also essential for any successful communicative exchange. In the study by Peterson and Swing (1985) a meaningful relationship was found between the listening to others' discussion during seatwork and the learning results. Although it is one study only, it is interesting to notice how the "passive" interaction given by mere listening could benefit the students' understanding or, even more, make it much easier if the explanations are not directly addressed to the student himself but to the other group members (Webb, 1991).

Factor 2. Disposition to dialogue

None.

In this diagram, we did not consider the factor "*disposition to dialogue*" since its categories related to learning activities were intentionally included in those related to the third factor, without making a difference between the demands and the offers of help based on the desire or the spontaneity they are expressed with. This decision was made because:

- Giving content-related explanations (we will get back to talk about the *explanations* in detail through the analysis of factor 3), in most studies, was a factor related to achievement (Webb, 1991) and, in some cases, a tool capable of producing beneficial cognitive restructuring (Bargh and Schul, 1980; Benware and Deci, 1984; Nestojko et al., 2014).
- The analysis of a series of studies on receiving content-related explanations showed how distinguishing between solicited and unsolicited help combined does not show any major differences, and that there is, in neither cases, a strong relationship between receiving explanation and achievement. A possible explanation of this result was given by Webb, who says: "*in order for an explanation to be effective, the receiver has to understand it, internalize it, and use it to correct the area of misunderstanding or lack of understanding"* (1991, p. 373). This hypothesis was later confirmed in subsequent studies (Webb et al., 2006; Pons et al., 2012). Indeed, if the explicit request for help is appropriately formulated and in a way that facilitates a specific answer, the claimant is likely to obtain bigger benefits (Colomina and Onrubia, 2001). This capacity was found, above all, among the students generally associated to high performance (Rohwer and Thomas, 1989).

As for the remaining categories related to the group process and the configuration of the group identity, being the students at their first experience with a cooperative approach, it has been preferred to consider them as objectives to work on from activity to activity, rather than charachteristics that can be directly and clearly observed within groups. Indeed, many of the categories here described are part of the functions provided by the management roles which were assigned in turns to the students, as previously described in the task structure; therefore, as we will see in the analysis of the fourth factor, their generic "trace" has been taken into consideration along the path.

Factor 3. Production and achievement of appropriate help behaviours

1. In relation to communication processes

None.

2. In relation to the learning activity

4. (1) Asking (spontaneously or not) for explanations on the content (concepts, interpretations) and (2) on the objectives of the activity assigned.

5. (3) Asking (spontaneously or not) for explanations on different aspects of the resolution process of the activity.

6. (4) Asking (spontaneously or not) for explanations on different aspects of the obtained final results and its possible implications.

7. (5) Providing (spontaneously or not) explanations on the content (concepts, interpretations) and (6) on the objective of the activity assigned.

8. (7) Providing (spontaneously or not) explanations on the different aspects of the resolution process of the activity.

9. (8) Providing (spontaneously or not) explanations on the different aspects of the obtained final result and its possible implications.

The behaviours described in this factor are crucial to create a positive interdependence among students (Serrano and González-Herrero, 1996). As suggested by Webb, Farivar and Mastergeorge (2002), we decided to make a difference between the demands for help and the offers for help as well as to distinguish the moment in which these requests were made (e.g. if during the reading of the sentence and the assignment[86], during the intermediate discussion or at the end of the analysis of the final results reached). This last subdivision is essential since the complexity in inquiring about the products obtained and their value is not the same as the one found in the process analysis (Webb and Mastergeorge, 2003). Asking for help on what is happening is something relatively observable, as opposed to asking for help on what might happen, since the latter needs an inferential anticipation process which is not granted (Piaget, 1978; Pons et al., 2012). The help requests here considered may be expressed either through explicit questions in the interrogative form (e.g. "what does this sign mean?", "why do you do it like that?" or "how do you calculate this value?"), or also through statements which implicitly require an external support (for example: "I did not understand", "I am lost" or "I can't solve this problem").

As for the offers of help, we need to point out the meaning of *explanations*: previous studies (Webb, 1983; 1989; 1991) have already shown how different explanations types can be considered, which are not all significantly related to the achievement. For this reason, we intentionally considered here as explanations only those forms of help which often (or only sometimes) proved to be effective. With reference to the notion of a continuum of elaboration suggested by Webb, "*giving explanations (high end of such a continuum) was consistently related to achievement, giving only the answer (low end of a continuum) was not related to achievement, and giving non-elaborated information (middle of the continuum) was sometimes related to achievement*" (1991, p. 367). In other words, short statements made of few words have not been considered. On the contrary, the explanations appropriate to the requests of help, explicitly or implicitly formulated, have been taken into account. The latter certainly include giving content-related explanations, like "*descriptions of how to solve a problem, or part of a problem, that included some elaboration of the solution process*" (Webb, 1991, p. 368), but also giving non-elaborative information, that is "*non-elaborated response which consisted of the explainer providing a simple but appropriate response to a content-related question"* (Peterson et al., 1984, p. 131) or error indication/correction without offering specific motivations. Non-explanatory help has not been considered, that is statements without any elaboration on how to obtain the correct answer, like giving a short answer to a problem or exercise (e.g. giving just the final result of an operation, or a yes or no answer), giving procedural information and giving managerial information.

Factor 4. Roles coordination

1. In relation to the learning activity

10. (1) Being responsible of one's own role, respecting the assigned tasks.

[86] Items (1)-(2) e (5)-(6) were respectively included in items 4 and 7 of our scheme since they mostly characterize the first work phase, the one of approach to the problem.

2. In relation to the group process

None.

This aspect was considered to be non-influential in the analysis by Pons et al. (2012). This is probably because, as suggested by the authors, the behaviours described in this factor can be already outlined in other categories related to factors 3 and 5. In this study, though, it has been decided to act "on the opposite direction", globally considering some of those items[87] within the same category: the responsibility taken for the role assigned. As already described in the paragraph describing factor 2, students were asked to respect these roles in order to familiarize time after time with the behaviours characterizing an effective learning activity among peers. Being the roles an expression of one or two categories and since they had to be changed from an activity to another, it was preferred to assess this single indicator. This choice would allow to observe if and how categories previously excluded would manifest in any form, also occasional or fragmented, given the rotation of roles from one activity to another.

Factor 5. Reciprocal control of work

None.

This factor was excluded from the final scheme since it did not come out so frequently during the first pilots (Spagnuolo and Canducci, in press; Spagnuolo and Lazzari, 2016), probably because it requires some familiarity from the students when thinking about one own and other peers' actions. Indeed, in many cases, it has been observed how the students did not put enough effort to understand others' argumentation in order to reach shared solutions, instead they were happy with the first suggested solutions. In absence of this effort, it is very difficult to start some processes of knowledge co-construction (Baker et al., 1999).

Some cases of reciprocal control of work emerged after the group tests, which confirms what was found by Serrano and Pons (2007) on the increase of these behaviours in situations when the reward structure is based, although partially, on other members' work. In conclusion, for the observation of these behaviours, it would be recommended to adopt a specific long-term training program. Anyhow, as previously pointed out, a trace of these behaviours is included in the item observations **4.** (1) related to assuming responsibility of the assigned roles.

[87] From factor 2 the categories involved are ***2. Respecting the group process***: (1) *respecting turns of intervention*, associated to the role of mediator. Indeed, the mediator him/herself, i.e. the one who should mediate the discussion, should not intervene while another member is speaking. Should this happen, he/she is not playing the role correctly. Therefore, it is possible to that **2.** (1) is a necessary condition to make **4.** (1) valid. The opposite is not granted: if he/she respects the intervention turns but other members don't, then he/she is not playing the role correctly, that is **2.** (1) does not necessarily imply **4.** (1). Another category, to be associated with all the roles is the **2.** (2) *assuming his/her own responsibility in the group process*; also in this case **4.** (1) implies **2.** (2), but not the opposite. In a nutshell, we could find a trace of **2.** (1) and **2.** (2) only when **4.** (1) is respected.
From factor 3 the categories included are ***2. in relation to the communication process***: (2) *expresses and analyses the question based on the function of the task*, associated to the role of reader.
From factor 5 the categories involved ***1. Respecting the learning activity***: (3) – *analysing the encountered difficulties and the process which let them overcome them,* associated to the role of writer (in written form) and presenter (in spoken form); ***2. Respecting the group process***: *(1) examines the accomplishing of roles and responsibilities in relation to the given rules,* associated to the role of mediator.

Factor 6. Quality of the conversation

1. In relation to the learning activity

11. (3) The way of speaking tries to reach for an agreement point with the others, to reach a shared knowledge.

2. In relaton to the group process

12. (3) Speaking in a critical but constructive way, on one's own and others' argumentations and considerations.

As for this factor, the items which strongly characterize the two ways of behaving, summed up by Mercer (1997), were selected, to tackle problems appropriately in a cooperative manner. The first, related to item **1.** (3), points out how the members of a group must, as much as possible, reason, analyse, compare and take decisions jointly. Furthermore, these dialogues must occur in a clear and explicit way, in order to avoid possible misunderstandings or relational conflicts - item **2.** (3).

If we consider the worst possible hypothesis related to item **1.** (3), where the students do not work jointly but they even get distracted talking about something else, it could make sense to associate this situation with the off-task interaction described in some experimental studies (Peterson, Janicki and Swing, 1981; Swing and Peterson, 1982; Peterson and Swing, 1985), which showed the existence of a significantly negative relation between this behaviour and achievement (Webb, 1991).

A different case is the one related to the occurring of more or less strong controversies during the execution of a group activity. If for Piaget (1975) the cognitive conflict is a fundamental step in the balancing processes, it is necessary to clearly define what it means and in what cases it is really effective. Kruger states that *"conflict is not the simple confrontation of opposing centrations, but an extended discourse that explores the reasoning behind the various viewpoints being presented"* (1993, p. 166). The way in which this argumentation develops plays a relevant role in the learning efficacy. Experimental results showed how the different frequency of verbal disagreements may affect in a different way the students' performance. For instance, the study carried out by Bearison, Magzamen and Filardo (1986) spotted out a non linear relation (inverted U-shaped curve) between verbal disagreements and students' performance: the latter were better in cases of average relevance, whereas in low and high relevance cases they showed the opposite effect.

A clarification on the so-called "own" argumentation and considerations described in item **1.** 3 is needed. The knowledge co-construction activity favours, in every single subject, the self-analysis on one's own conceptions and the language used to express them. For instance, this phenomenon emerges in those forms of speaking first defined by Piaget (1923) as "*self-centered*", since they are explicitly expressed but, substantially, self-directed. These manifestations can also be found during group activities with secondary school students (Pla, 1989), whose effect is to involve, intentionally or not, other participants into the discussion and implicitly solicit them to support an idea or put forward some changes (Rochera, Gispert and Onrubia, 1999; Colomina and Onrubia, 2001).

To sum up, the twelve categories considered in our framework are the following[88]:

1. *Expressing the understanding of the activity, task and assignment during the approach, process and production steps.*
2. *Taking into consideration others' opinion.*
3. *Accepting and respecting the decision taken by the group, on the obtained result.*

[88] The observation scheme of the mutuality parameter can be found in Appendix A.1. **NB:** The order of the items shown in appendix A.1 is different from the current one.

4. *Asking (spontaneously or not) for explanations on the content (concepts, interpretations) and on the objectives of the activity assigned.*
5. *Asking (spontaneously or not) for explanations on different aspects of the resolution process of the activity.*
6. *Asking (spontaneously or not) for explanations on different aspects of the obtained final results and its possible implications.*
7. *Providing (spontaneously or not) explanations on the content (concepts, interpretations) and on the objective of the assigned activity.*
8. *Providing (spontaneously or not) explanations on the different aspects of the resolution process of the activity.*
9. *Providing (spontaneously or not) explanations on the different aspects of the obtained final result and its possible implications.*
10. *Being responsible of one's own role, respecting the assigned tasks.*
11. *When speaking, attempt to reach an agreement point with the others, to reach a point of shared knowledge.*
12. *Speaking in a critical but constructive way, on one's own and others' argumentations and considerations.*

The audio-video recordings and the protocols on which the observation is based refer only to some specific activities. Taking into account the division of work described in tables 7 and 8, referred to in the task structure (section 2.3), activities number 2, 3, 6, 8 and 10 for the experimentation on linear functions, and activities number 1, 2, 6, 8 and 10 for the experimentation on quadratic functions have been considered. The sequences considered within these activities to analyse communicative transactions had a clearly defined start and end. Tables 10 and 11 refer to the selected sequences.

Activity	**Topic**	**Considered sequence**
2	Introductive problem on phone network tariffs	Exercises 1-2
2	Introductive problem on phone network tariffs	Exercises 3-4-5
3	Algebraic representation of linear functions: analysis of *m* and *q* coefficients	Exercise 1
3	Algebraic representation of linear functions: analysis of *m* and *q* coefficients	Exercises 2-3
3	Algebraic representation of linear functions: analysis of *m* and *q* coefficients	Exercises 4-5
6	1st group test	Step 2 - group discussion
8	Studying the sign of a linear functions	Exercises 1-2
10	2nd group test	Step 2 - group discussion

Table 10: Sequences analysed in the linear functions experimentations[89]

[89] The observation protocols related to these sequences can be found in Appendix C.2. **NB:** The order of the items follows the one specified in appendix A.1.

Activity	Topic	Considered sequence
1	Introductive problem on breaking distance	Exercises 1-2-3
1	Introductive problem on breaking distance	Exercises 4-5-6-7
2	Algebraic representation of quadratic functions: analysis of *a*, *b* and *c* coefficients	Exercises 1-2-3
2	Algebraic representation of quadratic functions: analysis of *a*, *b* and *c* coefficients	Exercise 4
6	1st group test	Step 2 - group discussion
8	Studying the sign of a quadratic function	Exercises 1-2
10	2nd group test	Step 2 - group discussion

Table 11: Sequences analysed in the quadratic functions experimentations[90]

The choice of these sequences is not random, but it stems from the desire to describe how the interactions evolved through the experimentations, analyzing the mutuality paramete in the initial, intermediate and final steps, taking into consideration the variability given by the type of mathematical task assigned and the work structure adopted (*roundtable* for discovery activities and *team statements* for group tests). Within the sequences, only the interaction time span among the group members have been taken into consideration, ignoring the teachers' short clarifying interventions.

The evaluation of such sequences was carried out on the sample working on each group and associating to every student a value from 1 to 5 for each item. More specifically we used a five-point Likert scale with the following percentage of occurrences: 1 (less than 10% occurrences), 2 (more than 10% and less than 40% occurrences), 3 (more than 40% and less than 60% occurrences), 4 (more than 60% and less than 90% occurrences) and 5 (more than 90% occurrences). The following step was the identification of a single value of the parameter associated to each student, through the calculation of the arithmetical average of the obtained values in the different items for each observed sequence.

Given the large amount of audiovisual material produced (around 540 hours of video records to be analysed), it has been possible to look only at the analysis carried out by two observers, who evaluated the mutuality parameter individually and whose agreement was assessed by means of the the interrater agreement index a_{wg} elaborated by Brown and Hausenstein (2005):

$$a_{wg} = 1 - \frac{2 \cdot S_{\bar{X}}^2}{[(H + L) \cdot \bar{X} - \bar{X}^2 - (H \cdot L)] \cdot [J/(J - 1)]}$$

[90] The observation protocols related to these sequences can be found in Appendix D.2. **NB:** The order of the items follows the one specified in appendix A.1.

where, H and L are the highest and the lowest value of the scale respectively, J is the number of observers, $\bar{X}$ and $S_{\bar{X}}^2$ are the average and the variance of the values assigned by the observers respectively.

In the present study, having to consider twelve items ($I = 12$), the multi-item variation has been used, defined as:

$$a_{wg}(I) = \frac{\sum_{i=1}^{I} a_{wg(i)}}{I}$$

The agreement coefficient goes beyond the limitations of the previous family of coefficient r_{wg} for several reasons (Benavente-Reche, 2009):

- The coefficients based on r_{wg} depend on the adopted Likert scale (5, 7 or 9 points), therefore they might give different results according to the scale.
- The number of observers has a major influence on the value of coefficients r_{wg}, which might affect the interpretation of the results.
- When working on group variables by aggregating individual ratings, coefficient a_{wg} "*provides operational definitions of consensus that are consistently interpretable in terms of the proportion of consensus to maximum possible dissensus*" (Brown and Hausenstein, 2005, p. 181).

It is worth remembering that the above mentioned authors recommend the interpretation of the a_{wg} similarly to r_{wg} (James, Demaree and Wolf, 1984), thus we can consider 0.70 as a limit value for an acceptable agreement. In this study the point of agreement between the two observers never went below 0.80, meaning that observations show a strong agreement.

2.7 Instrumentation

In this section the research tools used in the class experimentations will be described, with reference to the subject-area and the sociology-relational area.

2.7.1 Prerequisite test, pre-test and final test on linear functions

The prerequisite test on linear functions (appendix C.1.3) aimed at entry - check how thoroughly specific concepts had been learned by the examined student sample. Indeed, despite the fact that having a specific knowledge on the addressed mathematical content is fundamental, students need to practice specific cognitive skills in order to successfully solve, not only school problems, but also issues connected to everyday life. Referring back to the latest TIMSS[91] 2015 survey, a test was elaborated, focused on three specific cognitive domains: knowing, applying and reasoning[92]:

[91] *"TIMSS (Trends in International Mathematics and Science Study) is an international assessment of mathematics and science at the fourth and eighth grades [...] TIMSS 2015 continues the long history of international assessments in mathematics and science conducted by the International Association for the Evaluation of Educational Achievement (IEA). IEA is an independent international cooperative of national research institutions and government agencies that has been conducting studies of cross-national achievement since 1959"* (Mullis and Martin, 2014, p. 3).

[92] Even if this survey was targeted at students of 4th and 8th grades, the given definitions of the cognitive domains can be certainly adapted to a higher level schooling.

"The first domain, knowing, covers the facts, concepts, and procedures students need to know, while the second, applying, focuses on the ability of students to apply knowledge and conceptual understanding to solve problems or answer questions. The third domain, reasoning, goes beyond the solution of routine problems to encompass unfamiliar situations, complex contexts, and multi-step problems"[93]

More specifically, the questions in the test relate to the concepts of numbers, space and shapes, relations and functions, data and forecasts. The legal framework is given by the *Indicazioni Nazionali per il curricolo della scuola dell'infanzia e del primo ciclo*[94] (MIUR, 2012). Here the learning objectives to reach at the end of the first educational cycle, related with the topic "linear functions", were pinpointed. The objectives selected are organized on the basis of the fore-mentioned thematic areas and are referred to below in table 12.

Thematic areas	**Learning objectives**
Numbers	- Perform additions, subtractions, multiplications, divisions, sorting and comparisons between known numbers (natural numbers, integer numbers, fractions and decimal figures), whenever possible mentally or using the written algorithms, calculators and spreadsheets and assessing what instrument is more suitable. - Represent known numbers on a straight line. - Utilise the concept of relation between numbers or measures and expressing it with decimal figures, as well as with fractions. - Utilise equivalent fractions and decimal numbers to indicate the same rational number indifferent ways, being aware of advantages and disadvantages of the different representations. - Utilise the usual notation for exponentiation with a positive integer exponent, aware of the meaning, and the properties of the exponentiation to simplify calculations and notations. - Utilise the associative and distributive property to group up and simplify the operations, even mentally. - Describe with a numerical expression the sequence of operations which give solution of a problem. - Perform a simple calculus expression with known numbers, being aware of the meaning of brackets and the conventions on the order of operations.
Space and images	- Draw geometrical shapes and images, using appropriately and accurately the suitable tools (ruler, set square, the compass, the goniometer, geometry software program). - Draw points, segments and shapes on the Cartesian plane. - Draw geometrical shapes and images according to a description and a codification done by others.
Relations and Functions	- Interpret, build and transform formulas which contain letters to express relations and properties in a general form.
Data and forecasts	- Represent clusters of data, also using a spreadsheet.

Table 12: Distribution of the learning objectives based on thematic unit – linear functions

[93] From Mullis and Martin (2014, p. 24).

[94] The English translation for "*Indicazioni Nazionali per il curricolo della scuola dell'infanzia e del primo ciclo*" is "*National Recommendations on the syllabus of nursery school and primary school*". English translation by the author.

The questions of the prerequisite test are divided as follows:

Question N°	Thematic area
1	Numbers
2	Numbers
3	Numbers
4	Numbers, Space and shapes
5	Numbers, Data and forecasts
6	Numbers
7	Numbers
8	Numbers
9	Numbers, Space and shapes
10	Numbers
11	Numbers
12	Numbers, Relations and Functions
13	Numbers, Space and shapes
14	Data and forecasts

The assessment criteria of the prerequisite test are generally based on simply assigning one point to the correct answer and zero points to a missing or wrong answer. For questions 4 and 5, specifically, we considered respectively a score of 0.20 to each point correctly drawn on the Cartesian plane and 0.30 to each way of correctly representing sets. Clearly, in case of correct performance, the highest score for questions 4 and 5 is always one. The final score of the test is given by the addition of the points given to each question. Finally, we converted the score to a decimal scale.

The pre-test on the specific learning objectives (appendix C.1.4) was designed in order to check the students' pre-existing knowledge on the topic of the experimentation. The determination of the questions was explicitly based on the specific learning objectives previously described in the section related to the goal structure. The addressed topics are subdivided as follows:

Concept of function:
- Formal definition (question no. 1);
- Representation of functions [verbal, table, graphical, algebraic] (question no. 2).

Linear functions:
- Algebraic representation (question no. 3);
- Graphical meaning of coefficients *m* and *q* (question no. 4b);
- Graphical representation of a linear function (questions no. 4a, 5 and 6);
- Linear equations [algebraic and graphical solution] (question no. 7);
- Definition of the zeros of a linear function (question no. 8);
- Study of the sign of a linear function (question no. 8);
- Linear inequalities [algebraic and graphical solution] (question no. 9);
- Systems of linear inequalities (question no. 10).

The final test on the specific learning objectives (appendix C.1.5) was designed following the same structure of the pre-test, to be able to fairly compare the previous knowledge with the newly learned and, therefore, to be able to numerically determine the student's performance. The addressed topics are subdivided as follows:

Concept of function:
- Formal definition (questions no. 1a e 1b);
- Representation of functions [verbal, table, graphical, algebraic] (question no. 2).

Linear functions:
- Algebraic representation (question no. 4);
- Graphical meaning of the coefficients *m* e *q* (question no. 3);
- Graph of a linear function (questions no. 6);
- Linear equations [resolution using algebraic and graphical methods] (question no. 5);
- Definition of the zeros of a linear function (question no. 6);
- Study of the sign of a linear function (question no. 7);
- Linear inequalities [algebraic and graphical solution] (question no. 8);
- Systems of linear inequalities (question no. 9).

The comparison between the pre-test and the final test was made according to the following assessment table:

Topic	Pre-test question	Relative score	Final test question	Relative score	Total
Concept of function	1)	1.5	1a)	1	**2.5**
			1b)	0.5	
	2)	1	2)	1	
Linear functions: algebraic representation and graphical meaning of coefficients *m* and *q*	3)	1	3)	1.5	**4**
	4a)	0.5			
	4b)	1	4)	2	
	5) int. axis y	0.5	5) int. axis y	0.5	
	6)	1			
Graphical representation	5)	0.25	5)	0.25	**0.25**
Linear equations and zeros	5) int. axis x	1	5) int. axis x	1	**2**
	7)	1	6)	1	
Study of the sign	8)	1	7)	1	**1**
Linear inequalities	9)	1	8)	1	**1**
Systems of linear inequalities	10)	2.25	9)	2.25	**2.25**
		13		**13**	**13**

Table 13: Linear functions pre-test – final test comparative scheme

Also in this case, the final scores were converted to a decimal scale.

2.7.2 Prerequisite test, pre-test and final test on quadratic functions

The prerequisite test on quadratic functions (appendix D.1.3), as in the previous case, is focused on three specific cognitive domains: knowledge, application and reasoning. The questions were formulated starting from the analysis of the same thematic areas described for the linear functions, but this time the legal framework is that of the *Indicazioni Nazionali per i Licei*[95] (MIUR, 2010c). Starting from this text, the learning objectives to reach at the end of the first two grades, related to the topic "quadratic functions", were pinpointed. The chosen learning objectives are referred to in table 14.

Thematic areas	**Learning objective**
Arithmetic and algebra	The first two years will be dedicated to the passage from the arithmetic calculation to the algebraic one. The student will develop skills in calculus (mentally, with pen and paper, with tools) with integer numbers, with rational numbers in written form as a fraction as well as in decimal form. In this context the properties of operations will be studied. [...] The student will acquire an intuitive knowledge of real numbers, with specific reference to their geometric representation on a line. [...] The student will learn basic notions of literal calculus, the properties of polynomials and the basic operations among them. The student will acquire the ability to execute calculations with literal expressions in order to represent a problem (through an equation, an inequality or systems) and solve it, as well as to demonstrate general results, especially in arithmetic.
Geometry	The student will learn how to use the Cartesian coordinates method, at a first stage limited to the representation of points and lines over the plane, and to properties like parallelism and perpendicularity. The use of algebra in the representation of geometrical shapes will be accompanied by a deeper look at the conceptual and technical background of this mathematical branch.
Relations and functions	Objective of the study is the language of sets and functions (domain, composition, inverse, etc.), even to build simple representations and as an introductory step to the concept of mathematical model. More specifically, the student will learn to describe a problem through an equation, a dis-equation or a system of equations or dis-equations, to obtain information and find the solutions to a mathematical model of a phenomenon, even within the context of operative research or decision theory. The student will study functions like $f(x) = ax + b$, $f(x) = \|x\|$, $f(x) = \frac{a}{x}$, [...] in strictly mathematical terms as well as descriptive purposes or to solve application problems. He/she will study the first degree equations with one unknow variable, associated inequalities and systems of linear inequalities with two unknown variables, and will get to know the necessary techniques for solving them graphically and algebraically. He/she will learn the elements of the direct and inverse proportionality. The student will be able to move easily from one representation form to another (numerical, graphical, functional), also using IT tools for data representations.
Data and forecasts	The student will be able to represent and analyse in different ways (also using IT tools) a set of data, choosing the most suitable representations. [...]. The concept of mathematical model will be studied in a detailed way, pointing out the conceptual and methodical peculiarity, compared against the classical physics approach.

Table 14: Distribution of the learning objectives based on thematic unit - quadratic functions

The test questions were organized as follows:

[95] The denomination of thematic areas in the Indicazioni Nazionali per i Licei (MIUR, 2010c) is slightly different from the Indicazioni Nazionali per il curricolo della scuola dell'infanzia e del primo ciclo (MIUR, 2012). However, both documents have the same structure, indeed "*the choice to highlight within the general lines of each subject, the expected competences and to draft specific learning objectives where all the aspects that come into play when learning these competences, is meant to continue the Indicazioni per il curricolo del primo ciclo currently in force*" (MIUR, 2010c, p. 5).

Question N°	Thematic area
1	Arithmetic and algebra
2	Arithmetic and algebra
3	Arithmetic and algebra
4	Arithmetic and algebra
5	Arithmetic and algebra, Geometry
6	Arithmetic and algebra, Geometry
7	Arithmetic and algebra, Geometry
8	Arithmetic and algebra, Geometry
9	Arithmetic and algebra, Relations and Functions
10	Relations and Functions
11	Arithmetic and algebra, Relations and Functions, Data and forecasts
12 a)	Relations and Functions, Data and forecasts
12 b)	Geometry, Relations and Functions, Data and forecasts
12 c)	Geometry, Relations and Functions, Data and forecasts
12 d)	Relations and Functions, Data and forecasts
12 e)	Relations and Functions, Data and forecasts

The assessment criteria for the prerequisite test were generally based on the simple assignment of one point in case of correct answer and of zero points in case of missing or wrong answer. However, for some questions, the following specific criteria were considered:

- Question 6: each point correctly drawn on the Cartesian plane is assigned a score of 0.20. In case of correct execution, the highest score is always one.
- Question 7 e 8: 0.25 points is given if only the idea of interval is illustrated, whereas 0.5 and 0.75 is given if the interval is pointed out correctly, but the extremes of the interval are not marked appropriately. In case of correct execution, the highest score is always one for each question.
- Question 9: one point is given for each correct equation. More specifically, for each equation 0.25 points is given if the resolution has serious mistakes and lacks the final comment; 0.5 if the resolution has some mistakes and lacks the final comment; 0.75 if it lacks the final comment.
- Question 10: 0.25 points is given if only one example of function is mentioned; 0.5 if the given definition is incomplete and does not include an example; 0.75 if the given definition is incomplete or does not include an example. In case of correct execution the highest score is always one.
- Question 11: 0.25 points are given for each box correctly filled in. In case of correct execution the highest score is always one.

- Question 12 a): 0.25 points is given for each equivalence completed correctly. In case of correct execution the highest score is always one.
- Question 12 b): 0.25 points is given if only the question is answered or the graph is wrong and there is no answer to the question; 0.5 if the graph is wrong, but the given answer is correct; 0.75 if the graph is correct but the question is not answered. In case of correct execution the highest score is always one.
- Question 12 c): 0.25 points is given if a plausible answer is given, but incorrect; 0.5 if the answer is correct, but not formal; 0.75 if the answer has few inaccuracies. In case of correct execution the highest score is always one.
- Question 12 d): in case of correct execution, the highest score is, in this case, two. More specifically, a point is given for the correct definition of zeros of the function and a point for their correct determination in the given example.
- Question 12 e): In case of correct execution the highest score is two, in this case. More specifically, a point is given for the correct definition of a sign of a function and a point for its correct study in the given example.

Also in this case, the final score of the test is the sum of the points assigned to each question and, finally, converted to a decimal scale.

The pre-test on the specific learning objectives (appendix D.1.4) was built on the basis of the specific learning objectives already described in the goal structure, in relation to the topic "quadratic functions". The addressed topics are subdivided as follows:

Quadratic functions:
- Algebraic representation (question no. 1a);
- Graphical meaning of the coefficients, b e c (question no. 1b);
- Vertex and axis of symmetry of a parabola (question no. 1c);
- Graph of a quadratic function (question no. 2);
- Quadratic equations [algebraic and graphical solution] (question no. 3);
- Definition of zeros in a quadratic function (question no. 4);
- Study of the sign in a quadratic function (question no. 4);
- Quadratic inequalities [algebraic and graphical solution] (questions no. 5a e 5b);
- Systems of quadratic inequalities (question no. 6).

The final test on the specific learning objectives (appendix D.1.5) follows the same structure as the pre-test. The addressed topics are subdivided as follows:

Quadratic functions:
- Algebraic representation (question no. 2);
- Graphical meaning of the coefficients, b e c (question no. 1);
- Vertex and axis of symmetry of a parabola (question no. 3);
- Graph of a quadratic function (question no. 3);
- Quadratic equations [algebraic and graphical solution] (question no. 4);
- Definition of zeros in a quadratic function (question no. 4);
- Study of the sign in a quadratic function (question no. 5);
- Quadratic inequalities [algebraic and graphical solution] (questions no. 6a e 6b);
- Systems of quadratic inequalities (question no. 7).

The comparison between pre-test and final test was done according to the following assessment table:

Topic	Pre-test exercise	Pre-test exercise score	Final test exercise	Final test exercise score	Total
Quadratic functions: algebraic representation and graphic meaning and meaning of coefficients *a*, *b* and *c*	1a)	0.5	/	/	**4**
	1b)	3	1)	1.5	
			2)	2	
	2) int. axis y	0.5	3) int. axis y	0.5	
Vertex and axis of symmetry	1c)	1.5	3) vertex axis	1.5	**1.5**
Quadratic equations and zeros	2) int. axis x	1	3) int. axis x	1	**3.5**
	3)	1	4)	1	
	5a)	0.75	6a)	0.75	
	5b)	0.75	6b)	0.75	
Graphical representation	2)	0.25	3)	0.25	**0.75**
	5a)	0.25	6a)	0.25	
	5b)	0.25	6b)	0.25	
Study of the sign	4)	1	5)	1	**1**
Quadratic inequalities	5a)	1	6a)	1	**2**
	5b)	1	6b)	1	
Systems of quadratic inequalities	6)	0.25	7)	0.25	**2.25**
		0.5		0.5	
		0.75		0.75	
		0.75		0.75	
		15		**15**	**15**

Table 15: Quadratic functions pre-test – final test comparative scheme

Also in this case the final scores were converted to a decimal scale.

2.7.3 Questionnaire

The experimentation included administering three questionnaires to the students, at different times, in order to collect some information on their attitude toward the learning of mathematics and on their perception of the use cooperative learning in mathematics.

1. Initial attitude questionnaire[96]

In order to have a picture of the students' attitude toward the learning of mathematics, before starting the experimentation, some questions were selected from the student questionnaire elaborated within the TIMSS[97] (2015) investigation. The section named "*Mathematics in School*" of the *TIMSS 2015 8th grade Student Questionnaire*[98] has been followed as a reference. The selected questions refer to the area called "*student characteristics and attitudes toward learning*", which is organized in four sections: *student readiness to learn, student motivation, student self-concept, student characteristics*. The answers given to these questions were not used as further criterion in the initial group formation. The main use of this first questionnaire was to build a background picture related to the relationship each students had with mathematics. More specifically, objective data needed to be gained in order to prove the assumed students' lack of interest in mathematics in non-scientific Licei. Secondly, this tool allows to compare the results with the final attitude questionnaire's , in order to show possible relevant changes in the students' attitude towards mathematics, possibly due to the different learning method used. With this purpose in mind, the students' answers were recorded at the beginning of the experimentation in a non-anonymous way.

2. Final attitude questionnaire[99]

As already mentioned in point 1, in the final attitude questionnaire the same fact-finding questions as in the initial questionnaire can be found, but with some changes in their formulation. Indeed, in the new questions it is specified if the use of the cooperative method can affect (positively or negatively) the behaviours on which the students have already expressed their opinion in the initial questionnaire. Everything happens without showing the students the answers given at the beginning, thus trying not to influence their answers. With the same purpose in mind, it was decided to administer the questionnaires before showing the results of the final test, for obvious reasons, not anonymously.

3. Open-ended questionnaire on the Peer Education experience[100]

This last questionnaire was designed to give the students a chance to express their opinions on the cooperative experience anonymously. The structure of the questionnaire follows almost entirely the one suggested by Pesci (2004, pp. 21-22) and is made up of open-ended questions. Like in the previous case, the open-ended questionnaire was submitted before handing in the final tests. Again, this choice is linked to the desire of analyzing the students' thought on the whole experience out of any possible influence from the evaluation they would receive.

[96] The complete text of this questionnaire is in appendix B.1.
[97] See note 91.
[98] Although the questionnaire was addressed to Italian final grade secondary school students (8th grade), the selected questions have been reworded and adapted to the scholastic context.
[99] The complete text of this questionnaire is in appendix B.2.
[100] The complete text of this questionnaire is in appendix B.3.

Chapter 3

Data Analysis and Results

[…] longum iter est per praecepta,
breve et efficax per exempla.

Lucius Annaeus Seneca (Epistulae ad Lucilium, VI, 5)[101]

3.1 Data Analysis

The data are used statistically using four typologies of analysis:

- The ANOVA test has been used in several occasions to verify the existence of significant differences between either the expected values of the groups of each individual class or the cooperative methodologies (peer tutoring, cooperative learning, peer collaboration) and the specific variables. Further post-hoc analyses have been carried in all the ANOVA tests in order to compare the considered factors. The analyses undertaken using the ANOVA test are:

  1. Analysis of the pre-test among the groups of a class

Dependent variable	Pre-test results
Factor	Groups

  In each class the initial equivalence between the groups and the pre-test values (i.e. the previous students' knowledge about the subject) has been verified. This check is to ensure there is a certain initial homogeneity in the distribution of the students in the groups, so that the influence of this component (on the final results achieved by the same groups), can be either excluded or not. More specifically, in the case of the class associated to the peer collaboration methodology, it is likely that the analyses' results are not significative, as the method itself requires the class to be distributed among levels (e.g. in groups that might be not homogenous).

  2. Analysis of the mutuality among the groups of a class

Dependent variable	Mutuality observations
Factor	Groups

[101] "*The road to learning by precept is long, but by example short and effective*". English translation by the author.

The presence/absence of significative differences between the groups and the mutuality parameter has been observed in each class at the end of the experience. This analysis allows us to formulate hypotheses about the quality of the interactions which have characterised the several groups within the same class.

3. Analysis of the mutuality among the methodologies

Dependent variable	Mutuality observations
Factor	Methods

This analysis aims to observe whether, in general, the mutuality parameter, has a different behaviour depending on the considered didactic methodology, using a distinction, within the study, between the case of the linear functions and the case of the quadratic functions. This datum is very interesting as it allows us to formulate some initial hypotheses about the quality of the students' interactions developed by each method. A more detailed analysis of the single items characterising the parameter might reveal further information on analogies or differences due to the specific cooperative method adopted.

4. Analysis of the performance among the methodologies

Dependent variable	Performance
Factor	Methods

This analysis aims to observe if the performances, in general, behave differently according to the method used. By using this analysis it is possible to show whether the use of a single cooperative methodology can report results that are significantly different from the other typologies, independently from any other variable.

- The ANCOVA test has been used in several occasions to remove the possible heterogeneity on the dependent variable used each time and caused by certain elements, which would then be considered as covariables. Further post-hoc analyses have been carried in all of the ANCOVA tests, in order to compare the factors under consideration two by two. The analyses carried using the ANCOVA test have been the following:

  1. Analysis of the finaltest among the groups of a class

Dependent variable	Finaltest results
Factor	Groups
Covariates	Mutuality observations, pre-test results, prerequisites results

The presence (or absence) of significative differences among the groups, against the results achieved in the final test, has been observed in each class, with the addition of the analysis of the possible influence of the covariables mentioned in the table. More specifically, this has been used in order to observe: the possible influence of the mutuality parameter on the final results and, consequently, whether the communicative transactions within certain groups have resulted being much more profound and connected to influence significantly the progress of the final test;

whether the students' previous knowledge and prerequisites at the start of the experience have significantly influenced the finaltest results. Therefore, these analyses allow us to study if and which variables can have influenced the students' performance and to formulate new hypotheses to be compared, also, in relation to the individual cooperative methodology used.

2. Performance analysis among the groups of a class

Dependent variable	Performance
Factor	Groups
Covariates	Prerequisites results

The same analyses described in the previous case have been carried against the dependent variable "performance", defined as the difference between the results achieved by the students in the finaltest and in the pre-test. These analyses are extremely interesting as they allow us to analyse in which way the students have improved and the extent of this improvement within the groups and whether this improvement is due to the initial students' prerequisites.

3. Analysis of the performance among the methods

Dependent variable	Performance
Factor	Methods
Covariates	Mutuality observations, pre-test results, prerequisites results

It has been possible, with this analysis, to check whether the differences in the students' performance can be caused by the use of a particular methodology and, at the same time, it has been possible to calculate the significance of the covariables involved. A distinction, between the study of the linear functions and the study of the quadratic function, has been made in this case as well.

- The linear regeression test based on the least quadratics method has been used in order to verify whether a linear model, which describes the relationships that intervene among certain variables, exists. The analyses carried using the linear regression test are:

  1. *Linear model on the finaltest for the class*

Dependent variable	Finaltest
Independent variables	Mutuality observations, prerequisites results

The same analyses described in the previous case have been carried also on the dependent variable "performance", defined as the difference between the students' score in the finaltest and in the pre-test. These analyses are extremely interesting as they allow us to analyse in which way the students have improved and the extent of this improvement within the groups and whether this improvement is due to the covariables considered.

- The linear correlation coefficient has been calculated in order to evaluate the possible positive correlation between the “mutuality” and “finaltest” variables and between the “prerequisites” and “finaltest” variables.

All the statistical analyses have been made using SYSTAT 13.1 (2009).

3.2 Results

The analysis of the results will be organised making a distinction between the analyses carried within each class and the analyses carried in order to compare the three different methodologies.

3.2.1 Results by class

The results obtained with the test omnibus ANOVA typology 1. have shown that the composition of the groups resulted to be homogeneus against the pre-test results variable, in all the classes organised according to the peer tutoring and cooperative learning methodologies.

C_2 - (F (5, 19) = 1.072, p value = .420 > .05)

B_1 - (F (5, 22) = .170, p value = .970 > .05)

C_3 - (F (6, 26) = 1.926, p value = .129 > .05)

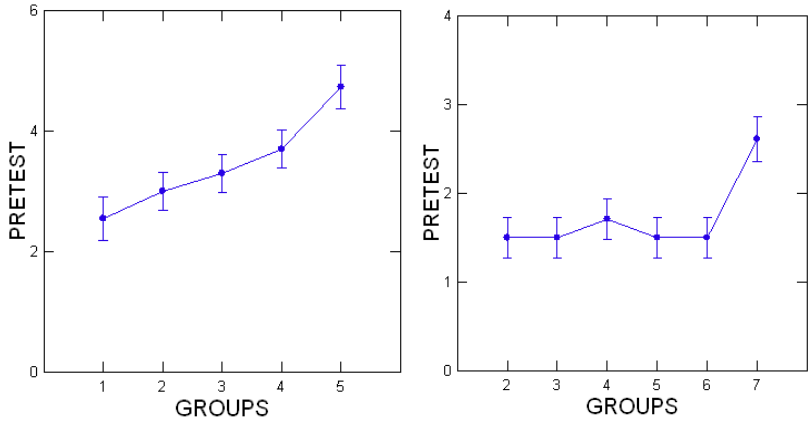
B_3 - (F (5, 22) = .257, p value = .930 > .05)

Instead, as for the case in which the classes were organised according to the peer collaboration methodology, the groups have not met the homogeneity criteria against the pre-test results variable.

A_2 - (F (4, 18) = 25.223, p value = .000 < .05)

A_3 - (F (6, 27) = 12.511, p value = .000 < .05)

Using a peer collaboration approach, the starting groups of the A_2 and A_3 classes have been voluntarily identified with different students' prior knowledge averages. For this reason it is plausible to accept the non-homogeneity of the results above mentioned. However the post-hoc analysis on these two classes shows that significative differences actually exist among the groups for class A_2 whereas, for class A_3, these differences only exist between all the groups[102] and group no. 7.



Graphs 1 & 2: Pre-test results divided by groups for classes A_2 and A_3 respectively

[102] Group 1 is not included within the statistical analysis of class A3 as full data of the pre-test parameter are not available.

Tukey's Honestly-Significant-Difference Test

GROUPS(i)	GROUPS(j)	Difference	p-Value	95% Confidence Interval	
				Lower	Upper
1	2	-0,453	0,301	-1,153	0,246
1	3	-0,753	0,033	-1,453	-0,054
1	4	-1,153	0,001	-1,853	-0,454
1	5	-2,187	0,000	-2,934	-1,439
2	3	-0,300	0,604	-0,948	0,348
2	4	-0,700	0,032	-1,348	-0,052
2	5	-1,733	0,000	-2,433	-1,034
3	4	-0,400	0,343	-1,048	0,248
3	5	-1,433	0,000	-2,133	-0,734
4	5	-1,033	0,003	-1,733	-0,334

Tukey's Honestly-Significant-Difference Test

GROUPS(i)	GROUPS(j)	Difference	p-Value	95% Confidence Interval	
				Lower	Upper
2	3	0,000	1,000	-0,479	0,479
2	4	-0,208	0,731	-0,687	0,270
2	5	0,000	1,000	-0,479	0,479
2	6	0,000	1,000	-0,479	0,479
2	7	-1,111	0,000	-1,628	-0,594
3	4	-0,208	0,731	-0,687	0,270
3	5	0,000	1,000	-0,479	0,479
3	6	0,000	1,000	-0,479	0,479
3	7	-1,111	0,000	-1,628	-0,594
4	5	0,208	0,731	-0,270	0,687
4	6	0,208	0,731	-0,270	0,687
4	7	-0,903	0,000	-1,420	-0,386
5	6	0,000	1,000	-0,479	0,479
5	7	-1,111	0,000	-1,628	-0,594
6	7	-1,111	0,000	-1,628	-0,594

Tables 16 & 17: Post-hoc test ANOVA 1. comparison for classes A_2 and A_3 respectively

The results achieved using the omnibus tes ANOVA typology 2. have not shown significative differences among the groups of almost all the classes, against the mutuality variable.

$$C_2 - (F\ (4, 18) = .362, p\ value = .831 > .05)$$

$$B_1 - (F\ (4, 20) = .615, p\ value = .658 > .05)$$

$$A_2 - (F\ (4, 20) = 1.744, p\ value = .193 > .05)$$

$$C_3 - (F\ (6, 27) = 1.840, p\ value = .142 > .05)$$

$$B_3 - (F\ (5, 22) = .523, p\ value = .756 > .05)$$

Only in the case of class A_3 the opposite situation has occurred.

$$A_3 - (F\ (6, 27) = 5.191, p\ value = .002 < .05)$$

However, using the post-hoc analysis, it is possible to observe that the only significant differences have been noted between the groups: 2 – 7, 3 – 5 and 3 – 7 (table 18).

Tukey's Honestly-Significant-Difference Test

GROUPS(i)	GROUPS(j)	Difference	p-Value	95% Confidence Interval	
				Lower	Upper
2	3	0,000	1,000	-0,479	0,479
2	4	-0,208	0,731	-0,687	0,270
2	5	0,000	1,000	-0,479	0,479
2	6	0,000	1,000	-0,479	0,479
2	7	-1,111	0,000	-1,628	-0,594
3	4	-0,208	0,731	-0,687	0,270
3	5	0,000	1,000	-0,479	0,479
3	6	0,000	1,000	-0,479	0,479
3	7	-1,111	0,000	-1,628	-0,594
4	5	0,208	0,731	-0,270	0,687
4	6	0,208	0,731	-0,270	0,687
4	7	-0,903	0,000	-1,420	-0,386
5	6	0,000	1,000	-0,479	0,479
5	7	-1,111	0,000	-1,628	-0,594
6	7	-1,111	0,000	-1,628	-0,594

Table 18: Post-hoc test ANOVA 2. comparison for class A_3

The results obtained with the test omnibus ANCOVA typology 1. having the mutuality as the covariable, show how this variable has had an influence on the finaltest results in all the classes. However, the factor “group” has not been significant in all the classes.

Analysis of Variance

Source	Type III SS	df	Mean Squares	F-Ratio	p-Value
GROUPS	20,702	4	5,175	3,622	0,037
MUTUALITY	48,280	1	48,280	33,785	0,000
Error	17,149	12	1,429		

Table 19: Omnibus ANCOVA type 1 results for class C_2

Analysis of Variance

Source	Type III SS	df	Mean Squares	F-Ratio	p-Value
GROUPS	11,160	4	2,790	1,401	0,284
MUTUALITY	16,185	1	16,185	8,127	0,013
Error	27,880	14	1,991		

Table 20: Omnibus ANCOVA type 1 results for class B_1

Analysis of Variance

Source	Type III SS	df	Mean Squares	F-Ratio	p-Value
GROUPS	15,140	4	3,785	1,769	0,195
MUTUALITY	13,204	1	13,204	6,172	0,027
Error	27,811	13	2,139		

Table 21: Omnibus ANCOVA type 1 results for class A_2

Analysis of Variance

Source	Type III SS	df	Mean Squares	F-Ratio	p-Value
GROUPS	28,903	6	4,817	2,652	0,048
MUTUALITY	60,905	1	60,905	33,526	0,000
Error	34,516	19	1,817		

Table 22: Omnibus ANCOVA type 1 results for class C_3

Analysis of Variance

Source	Type III SS	df	Mean Squares	F-Ratio	p-Value
GROUPS	6,005	5	1,201	0,618	0,688
MUTUALITY	50,103	1	50,103	25,801	0,000
Error	27,186	14	1,942		

Table 23: Omnibus ANCOVA type 1 results for class B_3

Analysis of Variance

Source	Type III SS	df	Mean Squares	F-Ratio	p-Value
GROUPS	36,269	6	6,045	3,141	0,026
MUTUALITY	8,920	1	8,920	4,635	0,044
Error	36,565	19	1,924		

Table 24: Omnibus ANCOVA type 1. results for class A_3

An additional type of test omnibus ANCOVA type 1. has been used to analyse the particular case of the two classes associated with the peer collaboration methodology. In this case the progression, among the groups, of the variable finaltest has been analysed, taking into consideration the prerequisites results and the pre-test results as covariables. Using these two covariables both results show there are never significant differences in class A_2 while the opposite happens with class A_3. More specifically, in both classes there are no significant differences among the groups against the prerequisites (table 25); whereas the covariable is significant in class A_3 (table 28). Instead, when the analysis has focused on the pre-test, differences have been found among the groups in the finaltest only in class A_3, with a p value slightly higher than 0.5 (p value = .089 - table 29). These differences will be later found to be significant, as confirmed by the post-hoc analysis in table 30.

Apart from this example, it is possible to notice an increasing trend, in both cases, which is similar to the one that has been found against the pre-test variable among the groups (see graph 1 and 2).

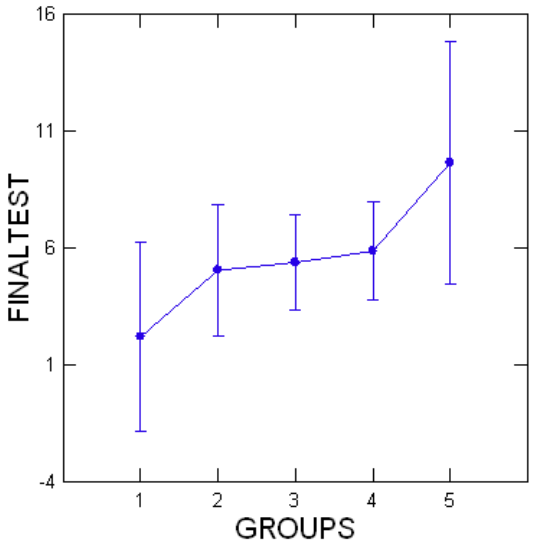
Analysis of Variance

Source	Type III SS	df	Mean Squares	F-Ratio	p-Value
GROUPS	9,282	4	2,320	0,773	0,562
PREREQUISITES	2,001	1	2,001	0,667	0,429
Error	39,014	13	3,001		

Analysis of Variance

Source	Type III SS	df	Mean Squares	F-Ratio	p-Value
GROUPS	13,924	4	3,481	1,141	0,387
PRETEST	3,848	1	3,848	1,261	0,285
Error	33,563	11	3,051		

Tables 25 & 26: Omnibus ANCOVA type 1. results for class A_2 having prerequisites results and pre-test results respectively as covariables



Graph 3: Finaltest results divided by groups for class A_2 (pre-test covariable)

Tukey's Honestly-Significant-Difference Test

GROUPS(i)	GROUPS(j)	Difference	p-Value	95% Confidence Interval	
				Lower	Upper
1	2	-2,848	0,438	-7,460	1,764
1	3	-3,182	0,452	-7,496	1,133
1	4	-3,662	0,546	-7,977	0,652
1	5	-7,448	0,369	-12,060	-2,835
2	3	-0,334	0,999	-4,648	3,981
2	4	-0,814	0,990	-5,129	3,500
2	5	-4,600	0,624	-9,212	0,013
3	4	-0,480	0,997	-4,475	3,514
3	5	-4,266	0,549	-8,580	0,049
4	5	-3,786	0,452	-8,100	0,529

Table 27: Graphic comparison of the ANCOVA type 1. test post-hoc results for class A_2, having pre-test results as covariable

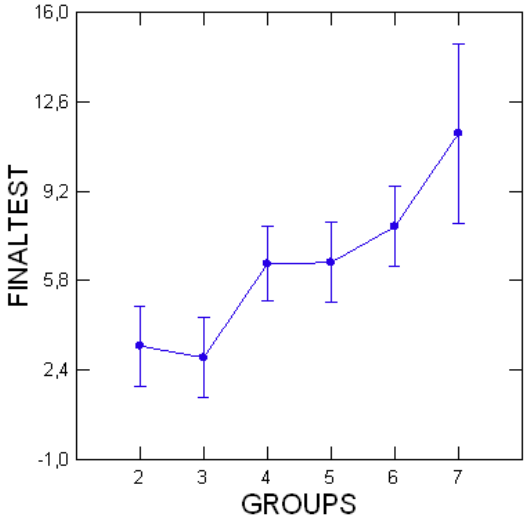
Analysis of Variance

Source	Type III SS	df	Mean Squares	F-Ratio	p-Value
GROUPS	7,582	5	1,516	1,130	0,390
PREREQUISITIES	13,635	1	13,635	10,158	0,007
Error	18,793	14	1,342		

Analysis of Variance

Source	Type III SS	df	Mean Squares	F-Ratio	p-Value
GROUPS	90,104	5	18,021	10,165	0,000
PRETEST	5,796	1	5,796	3,269	0,089
Error	28,365	16	1,773		

Tables 28 & 29: Omnibus ANCOVA type 1 results for class A_3 having prerequisites results and pre-test results respectively as covariables



Graph 4: Finaltest results divided by groups for class A_3 (pre-test covariable)

Tukey's Honestly-Significant-Difference Test

GROUPS(i)	GROUPS(j)	Difference	p-Value	95% Confidence Interval	
				Lower	Upper
2	3	0,445	0,997	-2,589	3,479
2	4	-3,122	0,058	-6,156	-0,089
2	5	-3,172	0,038	-6,206	-0,139
2	6	-4,535	0,002	-7,569	-1,501
2	7	-8,077	0,009	-11,354	-4,800
3	4	-3,567	0,025	-6,601	-0,534
3	5	-3,617	0,015	-6,651	-0,584
3	6	-4,980	0,001	-8,014	-1,946
3	7	-8,522	0,006	-11,799	-5,245
4	5	-0,050	1,000	-3,084	2,983
4	6	-1,413	0,714	-4,446	1,621
4	7	-4,955	0,092	-8,231	-1,678
5	6	-1,363	0,700	-4,396	1,671
5	7	-4,904	0,187	-8,181	-1,628
6	7	-3,542	0,497	-6,819	-0,265

Table 30: Graphic comparison of the ANCOVA type 1. test post-hoc results for class A_3, having pre-test results as covariable

The results obtained using the omnibus ANVOCA type 2. tests, having the prerequisites results as covariable, show how these variables have significantly affected the performance in almost all the classes. Only in class A_2, which is associated to the peer collaboration methodology, this has not happened. Furthermore, under these conditions, the "group" factor has never shown a significant result.

Analysis of Variance

Source	Type III SS	df	Mean Squares	F-Ratio	p-Value
GROUPS	8,093	4	2,023	1,040	0,434
PREREQUISITES	12,647	1	12,647	6,500	0,029
Error	19,457	10	1,946		

Table 31: Omnibus ANCOVA type 2 results for class C_2

Analysis of Variance

Source	Type III SS	df	Mean Squares	F-Ratio	p-Value
GROUPS	9,088	4	2,272	1,082	0,403
PREREQUISITES	20,013	1	20,013	9,530	0,008
Error	29,400	14	2,100		

Table 32: Omnibus ANCOVA type 2 results for class B_1

Analysis of Variance

Source	Type III SS	df	Mean Squares	F-Ratio	p-Value
GROUPS	4,575	4	1,144	0,300	0,872
PREREQUISITES	0,617	1	0,617	0,162	0,695
Error	42,008	11	3,819		

Table 33: Omnibus ANCOVA type 2 results for class A_2

Analysis of Variance

Source	Type III SS	df	Mean Squares	F-Ratio	p-Value
GROUPS	15,582	6	2,597	0,917	0,505
PREREQUISITES	29,176	1	29,176	10,307	0,005
Error	50,953	18	2,831		

Table 34: Omnibus ANCOVA type 2 results for class C_3

Analysis of Variance

Source	Type III SS	df	Mean Squares	F-Ratio	p-Value
GROUPS	11,010	5	2,202	1,325	0,310
PREREQUISITES	43,261	1	43,261	26,040	0,000
Error	23,258	14	1,661		

Table 35: Omnibus ANCOVA type 2 results for class B_3

Analysis of Variance

Source	Type III SS	df	Mean Squares	F-Ratio	p-Value
GROUPS	6,411	5	1,282	0,833	0,548
PREREQUISITIES	15,834	1	15,834	10,283	0,006
Error	21,557	14	1,540		

Table 36: Omnibus ANCOVA type 2 results for class A_3

The results obtained using the linear regression tests show how, in all the classes, the regression straight line (calculated by using the finaltest results as dependent variable and the mutuality as independent variable) represents a significant model of the relationship between the two variables.

C_2 - (F (1, 18) = 17.355, p value = .001 < .05)

B_1 - (F (1, 14) = 7.457, p value = .018 < .05)

A_2 - (F (1, 19) = 19.570, p value = .013 < .05)

C_3 - (F (1, 23) = 14.722, p value = .001 < .05)

B_3 - (F (1, 21) = 34.035, p value = .000 < .05)

A_3 - (F (1, 23) = 19.533, p value = .000 < .05)

The results obtained using the linear regression tests show how, in all the classes, the regression straight line (calculated by using the finaltest results as dependent variable and the prerequisites results as independent variable) represents a significant model of the relationship between the two variables.

C_2 - (F (1, 19) = 37.293, p value = .000 < .05)

B_1 - (F (1, 18) = 30.947, p value = .000 < .05)

A_2 - (F (1, 19) = 5.007, p value = .039 < .05)

C_3 - (F (1, 23) = 13.744, p value = .001 < .05)

B_3 - (F (1, 21) = 30.518, p value = .000 < .05)

A_3 - (F (1, 21) = 60.496, p value = .000 < .05)

The results obtained from the calculus of the linear correlation coefficient show how, in all the classes, there is an either moderate or strong direct correlation between the finaltest results and mutuality variables.

$\rho_{2G} = .721$

$\rho_{1Y} = .619$

$\rho_{2E} = .559$

$\rho_{3X} = .642$

$\rho_{3Y} = .801$

$\rho_{3Q} = .694$

The results obtained from the calculus of the linear correlation coefficient show how, in all the classes, there is an either moderate or strong direct correlations between the finaltest results and prerequisites variables.

$\rho_{2G} = .829$

$\rho_{1Y} = .812$

$\rho_{2E} = .477$

$\rho_{3X} = .629$

$\rho_{3Y} = .785$

$\rho_{3Q} = .872$

3.2.2 Result by methods

The results obtained with the omnibus ANOVA type 3. tests have not shown significative differences, among the methods[103], against the mutuality variable. This has happened for both cases: linear functions and quadratic functions.

linear functions study - (F = 1.305, p value = .279)

quadratic functions study - (F = 2.163, p value = .122)

The results obtained with the omnibus ANOVA type 4. tests have shown significative differences, among the methods, against the performance variable. This has happened for the case of linear functions only.

linear functions study - (F (2, 48) = 6.448, p value = .003)

quadratic functions study - (F (2, 74) = 1.047, p value = .356)

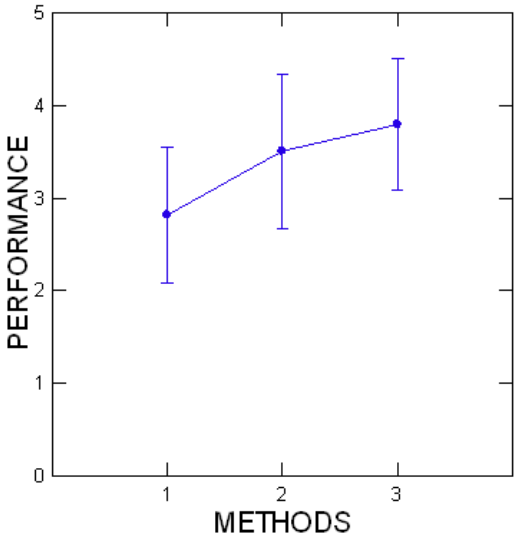
The results obtained with the omnibus ANOVA type 3. tests against the performance variable and having the mutuality, the prerequisites results and the pre-test results as covariables, show different results depending on the subject under analysis.

linear functions study

Analysis of Variance

Source	Type III SS	df	Mean Squares	F-Ratio	p-Value
METHODS	7,355	2	3,677	1,870	0,167
MUTUALITY	13,879	1	13,879	7,058	0,011
PREREQUISITES	13,263	1	13,263	6,744	0,013
PRETEST	18,616	1	18,616	9,467	0,004
Error	80,627	41	1,967		

Table 37: Omnibus ANCOVA type 3 results – linear functions



Graph 5: Performance results divided by methodologies – linear functions

[103] In the following analyses we will identify peer collaboration with method no.1, cooperative learning with method no. 2 and peer tutoring with method no. 3.

The analysis on the sample which has been working on the linear functions topic does not show variation in the students' performance which can be ascribed to the typology of cooperative methodology used, as shown in table 37. In fact, the F value found does not show significant differences, if we ignore the effects caused by the mutuality, the previous knowledge and the prerequisites on the performance (F (2, 47) = 1.870, p value = .167 > .05). If we observe Graph 5, it is possible to note how it seems there is an increasing trend in the achieved performances using the three methodologies.

Tukey's Honestly-Significant-Difference Test

METHODS(i)	METHODS(j)	Difference	p-Value	95% Confidence Interval	
				Lower	Upper
1	2	-0,690	0,477	-1,921	0,541
1	3	-0,976	0,145	-2,164	0,212
2	3	-0,286	0,860	-1,534	0,962

Table 38: Comparison of the ANCOVA type 3. test post-hoc results – linear functions

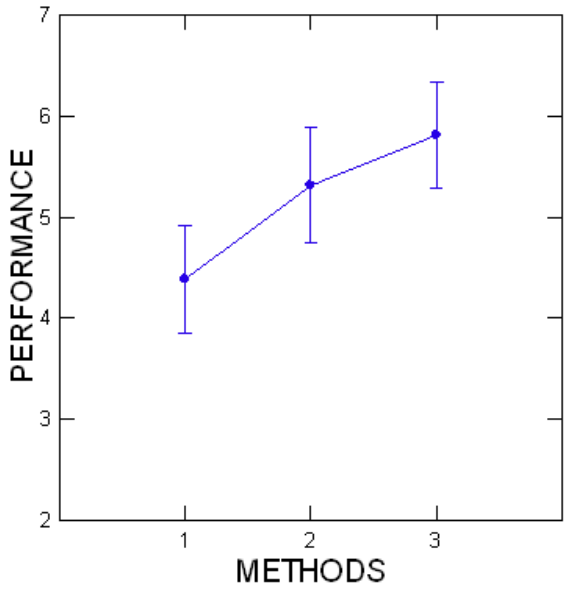
The post-hoc comparison (table 38) also does not show significative differences among any of the three interactive structures analysed.

quadratic functions study

Analysis of Variance

Source	Type III SS	df	Mean Squares	F-Ratio	p-Value
METHODS	24,331	2	12,165	7,197	0,001
MUTUALITY	42,614	1	42,614	25,210	0,000
PREREQUISITIES	38,540	1	38,540	22,800	0,000
PRETEST	15,628	1	15,628	9,245	0,003
Error	111,563	66	1,690		

Table 39: Omnibus ANCOVA type 3 results – quadratic functions



Graph 6: Performance results divided by methodologies – quadratic functions

Instead in the quadratic functions subject, the omnibus analysis shows how there are significant differences which can be attributed to the methods variable, as shown in table 39 (F (2, 72) = 7.197, p value = .001 < .05). On graph 6 it is also possible to observe how the representation of the performance follows an increasing trend against the three cooperative methodologies.

Tukey's Honestly-Significant-Difference Test

METHODS(i)	METHODS(j)	Difference	p-Value	95% Confidence Interval	
				Lower	Upper
1	2	-0,927	0,050	-1,850	-0,005
1	3	-1,426	0,001	-2,299	-0,553
2	3	-0,498	0,420	-1,413	0,416

Table 40: Comparison of the ANCOVA type 3. test post-hoc results – quadratic functions

In fact, the post-hoc comparison (table 40) does not allow us to draw any conclusion on the existence of significative differences among the totality of methods taken into consideration, but only between method 1 (peer collaboration) and 3 (peer tutoring). A borderline situation also exists between method 1 (peer collaboration) and 2 (cooperative learning), with a p value equal to exactly 0.5.

In both experimental situations (where the subject is either the study of the linear functions or the study of the quadratic functions), the considered covariables (e.g. mutuality, pre-test results and prerequisites results), have shown a high level of significance with good values in size effect (linear function case with $r^2 = .536$ and quadratic function case with $r^2 = .622$).

3.2.3 Questionnaires statistics

Initial and final attitude questionnaires

In this section, a comparative analysis among the answers given to the questionnaire about the students' attitude towards the learning of mathematics before and after the experience will be illustrated[104]. Once again, the ANOVA typology of statistical analysis has been used in order to verify the existence of significant differences against this variable, both between the two didactic units and among the three cooperative methodologies. Post-hoc analyses have been subsequently carried out in all the ANOVA tests, in order to compare the two considered factors two by two.

The analyses carried using the ANOVA test are:

1. Analysis of the students' attutide towards the learning of mathematics before and after the experimentation between the two didactic units.

Dependent variable	Diff_quest
Factor	Subject

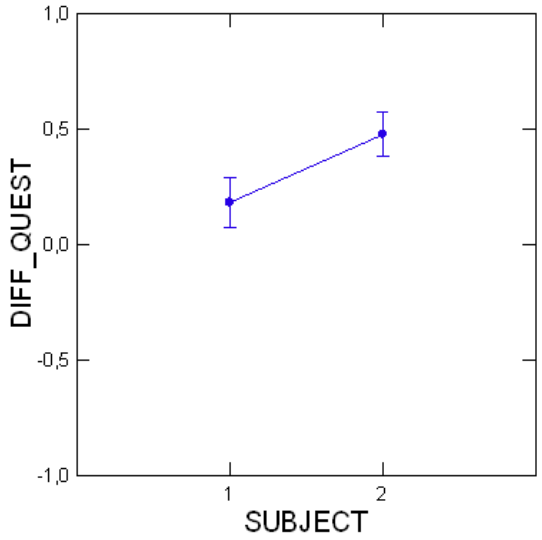
[104] Full data available in Appendices C.3 and D.3.

The omnibus analysis shown in table 41 shows how there are significant differences ascribable to the subject variable (F (1, 127) = 16.451, p value = .000 < .05) and, specifically, to the didactic unit on quadratic functions (graph 7).

Analysis of Variance

Source	Type III SS	df	Mean Squares	F-Ratio	p-Value
SUBJECT	2,706	1	2,706	16,451	0,000
Error	20,564	125	0,165		

Table 41: Omnibus ANOVA results – comparison of the questionnaires differences by subject



Graph 7: Questionnaires differences results by subject (1 = linear, 2 = quadratic)

2. Analysis of the students' attutide towards the learning of mathematics before and after the experimentation among the three cooperative methodologies.

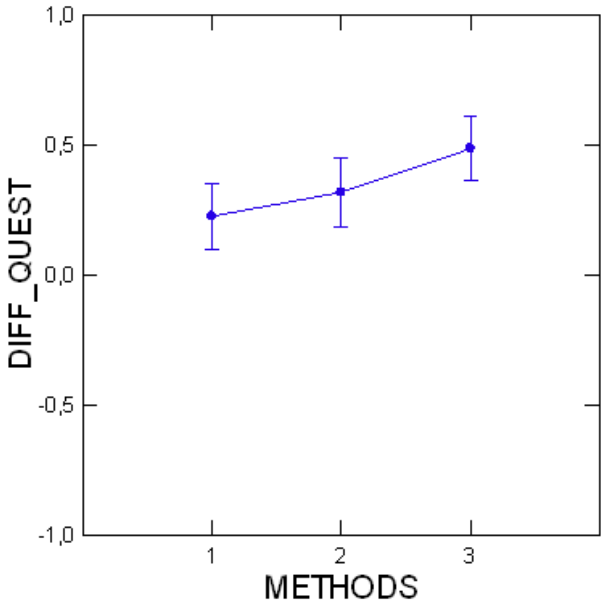
Dependent variable	Diff_quest
Factor	Methods

The omnibus analysis on table 42 shows how significant differences ascribable to the methods variable exist (F (2, 127) = 4.376, p value = .0015 < .05). Graph 8, moreover, shows how the representation of the differences follows an increasing trend compared to the three cooperative methods.

Analysis of Variance

Source	Type III SS	df	Mean Squares	F-Ratio	p-Value
METHODS	1,534	2	0,767	4,376	0,015
Error	21,737	124	0,175		

Table 42: Omnibus ANOVA results – comparison of the questionnaires differences by methodology



Graph 8: Performance results divided by methodologies – quadratic functions

However, the post-hoc comparison (table 43) does not allow to state there are significant differences among all the methodologies considered but only between method 1 peer collaboration and method 3 peer tutoring.

Tukey's Honestly-Significant-Difference Test

METHODS(i)	METHODS(j)	Difference	p-Value	95% Confidence Interval	
				Lower	Upper
1	2	-0,092	0,583	-0,310	0,126
1	3	-0,260	0,010	-0,469	-0,050
2	3	-0,168	0,157	-0,381	0,046

Table 43: Comparison of the ANCOVA type 3. test post-hoc results – quadratic functions

Open-ended questionnaire on the Peer Education experience

This section illustrates the answers given by the students on the final questionnaire about the experience. The answers are in a tabular form. As this involves open-ended questions, the different answers have been classified according to some more general items. Once again, the data shown will be divided by didactic unit, in order to highlight the possible differences within the given answers, not only among the cooperative methodologies but also in terms of educational level.

1) A lot of people say cooperative learning[105] *requires more effort but results in being more efficient: what is your opinion after the experience?*

The answers given to the first question have been divided here into two blocks, in order to highlight both the opinions about the *higher/lower effort* required by the cooperative methodologies and the opinions on their *higher/lower efficiency* compared to the traditional methodologies. As this is an open-ended question, some students have not expressed their opinion on either of the topics, therefore

[105] In this case, being the questionnaire aimed at the students, the general term "cooperative learning" has been adopted, in order not to specify, every time, the modality used in the text.

a third item including various typologies of answers has been added. Among these, for example, there are those who state that the effort is the same, those who prefer individual work and, more interestingly, those who said they were uncertain as everything depends on the group in which they were working.

Classes:	**A_2**	**B_1**	**C_2**
Higher effort	5 (27.78 %)	8 (33.33 %)	6 (28.57 %)
Lower effort	3 (16.67 %)	3 (12.50 %)	5 (23.81 %)
Uncertain / other	10 (55.56 %)	13 (54.17 %)	10 (47.62%)

Table 44: Percentage of answers to the first question (effort) in the open–ended questionnaire – linear functions

Classes:	**A_3**	**B_3**	**C_3**
Higher effort	15 (57.69 %)	13 (61.90 %)	12 (48.00 %)
Lower effort	1 (3.85 %)	0 (0.00 %)	1 (4.00 %)
Uncertain / other	10 (38.46 %)	8 (38.10 %)	12 (48.00 %)

Table 45: Percentage of answers to the first question (effort) in the open–ended questionnaire – quadratic functions

Classes:	**A_2**	**B_1**	**C_2**
Higher efficiency	15 (83.33 %)	17 (70.83 %)	13 (61.90 %)
Lower efficiency	0 (0.00 %)	4 (16.67 %)	0 (0.00 %)
Uncertain / other	3 (16.67 %)	3 (12.50 %)	8 (38.10 %)

Table 46: Percentage of answers to the first question (efficiency) in the open–ended questionnaire – linear functions

Classes:	**A_3**	**B_3**	**C_3**
Higher efficiency	17 (65.38 %)	16 (76.19 %)	19 (76.00 %)
Lower efficiency	2 (7.69 %)	0 (0.00 %)	1 (4.00 %)
Uncertain	7 (26.92 %)	5 (23.81 %)	5 (20.00 %)

Table 47: Percentage of answers to the first question (efficiency) in the open–ended questionnaire – quadratic functions

2) How did you feel during the group-based activities?
3) What is your opinion about the class discussion at the end of the group – based activities? How did you feel during the discussions?

The answers to the second and third question have been gathered below in a single table, taking into consideration three items: *good/engaged, bad/uncomfortable* and *fluctuating.* The answers, in fact, have not shown significant differences among the feelings the students had during the group-based activities and the feelings they had during the class-based discussions.

Classes:	**A_2**	**B_1**	**C_2**
Good / engaged	15 (83.33 %)	14 (58.33 %)	14 (66.67 %)
Bad / uncomfortable	1 (5.56 %)	4 (16.67 %)	0 (0.00 %)
Fluctuating	2 (11.11 %)	6 (25.00 %)	7 (33.33 %)

Table 48: Percentage of answers to the second – third question in the open–ended questionnaire – linear functions

Classes:	**A_3**	**B_3**	**C_3**
Good / engaged	14 (53.85 %)	16 (76.19 %)	14 (56.00 %)
Bad / uncomfortable	3 (11.54 %)	0 (0.00 %)	3 (12.00 %)
Fluctuating	9 (34.62 %)	5 (23.81 %)	8 (32.00 %)

Table 49: Percentage of answers to the second – third question in the open–ended questionnaire – quadratic functions

4) What did you like most about the experience? Why?
5) What did you like least about the experience? Why?

Following the observation of the answers given, the fourth and the fifth question have been classified against five/six items. The only difference between the two tables concerns the presence, in the first, of two items regarding *socialization/enjoyment* and *collaboration/confidence* and, in the second, the presence of the single item regarding *difficulty within the group*. Both cases aim to point out certain positive/negative aspects, deriving from working on a group-based activity. The remaining items, instead, are common to both tables. More specifically, the third includes the more general answers concerning the new didactic methodology (e.g. those about the structure of the lectures, the discovery activities, the management roles, the group-based discussions, etc.). In particular the fourth item refers to the group-based assessment. The choice to distinguish this aspect from the other already seen in the previous item, has been taken in order to underline one among the most innovative elements included in these situations which the students themselves have defined as the most favoured/criticised. Finally, the last two items count the blank answers and those regarding secondary aspects (e.g. the presence of cameras, the duration of the experiments, the specific mathematic subject, ecc.).

Classes:	**A_2**	**B_1**	**C_2**
Socialization / enjoyment	3 (16.67 %)	2 (8.33 %)	3 (14.29 %)
Collaboration / confidence	6 (33.33 %)	10 (41.67 %)	3 (14.29 %)
New methodology (general structure)	2 (11.11 %)	8 (33.33 %)	5 (23.81 %)
New methodology (group assessments)	4 (22.22 %)	2 (8.33 %)	4 (19.05 %)
No answer / blank	0 (0.00 %)	0 (0.00 %)	2 (9.52 %)
Other	3 (16.67 %)	2 (8.33 %)	4 (19.05 %)

Table 50: Percentage of answers to the fourth question in the open–ended questionnaire – linear functions

Classes:	**A_3**	**B_3**	**C_3**
Socialization / enjoyment	1 (3.85 %)	4 (19.05 %)	3 (12.00 %)
Collaboration / confidence	7 (26.92 %)	5 (23.81 %)	14 (56.00 %)
New methodology (general structure)	15 (57.69 %)	10 (47.62 %)	4 (16.00 %)
New methodology (group assessments)	0 (0.00 %)	0 (0.00 %)	0 (0.00 %)
No answer / blank	0 (0.00 %)	0.00 (%)	0 (0.00 %)
Other	3 (11.54 %)	2 (9.52 %)	4 (16.00 %)

Table 51: Percentage of answers to the fourth question in the open–ended questionnaire – quadratic functions

Classes:	**A_2**	**B_1**	**C_2**
Difficulty within the group (collaboration / integration)	0 (0.00 %)	10 (41.67 %)	7 (33.33 %)
New methodology (general structure)	6 (33.33 %)	4 (16.67 %)	4 (19.05 %)
New methodology (group assessments)	0 (0.00 %)	5 (20.83 %)	1 (4.76 %)
No answer / blank	9 (50.00 %)	2 (8.33 %)	5 (23.81 %)
Other	3 (16.67 %)	3 (12.50 %)	4 (19.05 %)

Table 52: Percentage of answers to the fifth question in the open – ended questionnaire – linear functions

Classes:	**A_3**	**B_3**	**C_3**
Difficulty within the group (collaboration / integration)	3 (11.54 %)	6 (28.57 %)	7 (28.00 %)
New methodology (general structure)	9 (34.62 %)	1 (4.76 %)	5 (20.00 %)
New methodology (group assessments)	6 (23.08 %)	4 (19.05 %)	1 (4.00 %)
No answer / blank	1 (3.85 %)	5 (23.81 %)	5 (20.00 %)
Other	7 (26.92 %)	5 (23.81 %)	7 (28.00 %)

Table 53: Percentage of answers to the fifth question in the open – ended questionnaire – quadratic functions

Chapter 4

Conclusions and Discussion

That is what learning is. You suddenly understand something
you've understood all your life, but in a different way.

Doris Lessing (The Four-Gated City, 1969)

4.1 Conclusions

4.1.1 Psycho educational interpretation of results

The results described in the previous section show similarities as well as differences between the two subject areas considered. This suggests that the students' performance is affected by the type of knowledge involved, or rather, by their previously acquired knowledge of the topic (Marchesi and Martin, 2000; Shapiro, 2004; Ozuru, Dempsey and McNamara, 2009). Actually, it is important to remember that, beyond the differences linked to the topics dealt with, the students' previous knowledge on the two areas resulted to be quantitatively different. In the case of linear functions, the students showed they had already some knowledge before the start of the work. On the contrary, in the case of the quadratic functions, the topics resulted to be unknown to the entire sample under analysis (see graphs in appendix C.1.2 and D.1.2 for the pre-test results).

As for the interaction processes developed within the groups, it is possible to observe how in almost all the classes there was no significant difference. Only in class A_3 some differences were found on the mutuality parameter, in relation to three pairs of groups. This result shows how, on a mere quantitative level, the students adopted the same behavioural model during the group interaction, regardless the cooperating method used in each class. Such behavioural uniformity might also depend on the students' lack of experience[106] in correctly interacting during group activities, as the low values in the observation of mutuality over the whole sample have proved (see graphs in appendix A.2).

Furthermore, the comparison among the methodologies showed that none of them presented significant difference in the mutuality values both in the case of linear functions and quadratic functions units. However, mutuality always affects the final students' performance in a relevant way, in all the classes analysed.

A positive correlation exists in each class, as the analysis of the linear regression test and Pearson's coefficients show. This indicates high values in the final test results correspond to high values of the

[106] We want to remind that all the students involved coped with this activity for the first time.

mutuality parameter. The influence of mutuality is also reinforced by the significance of this variable in the results of the comparison of the students' performance in the three methodologies.

Apparently, mutuality behaves in an unusual way: quantitatively – i.e. when it is considered independently and without any relation with the other variables – no difference deriving from the application of a specific cooperative method is observed. On the contrary, when it is considered in relation with learning – in our study, associated to the performance variable – it assumes a qualitatively important role, up to the point where there is a significant influence on the factor 'methods', in the quadratic function didactic unit. This result is indicative since it completely overturns the results linked to the comparison of performance among the methods, in which no significant difference was found. The situation becomes more complex, when the influence on the performance due to the previous knowledge on the topics and to the students' prerequisites is considered, as they seem to mingle with the influence of mutuality.

The ability of the students to wiggle among specific cognitive domains (knowledge, application and reasoning) related to mathematics – quantified through the prerequisite test – is essential for any learning process on mathematical content, whichever they are. The influence of mutuality might change in quality, according to the cooperative method used – as proved by the different values of Pearson's indexes. However, in general, the positive correlation in this case was always moderate or strong.

The information regarding students' previous knowledge on the topics allowed us to distinguish qualitatively the analysis in two clusters and to compare several classes in different contexts by using the performance variable. Such information was essential and determinant in order to pinpoint the best interactive structure among peer tutoring, cooperative learning and peer collaboration during the experimentation. Analysing the two content clusters separately, it can be said that:

- Working on contents partially known by students, or whose basic notions had already been addressed in previous courses, it was not possible to find any significant differences in performance among the three cooperative methods. A likely interpretation of this is that the students had, from the beginning, the necessary cognitive tools to rearrange the structure of the disciplinary content. Therefore, although there is not a real conceptual change, a re-elaboration of this kind might imply a qualitative change which could occur either in case of interaction with peers having the same initial knowledge, and in the case in which the more skilled students help. This would explain the specific case of class A_2 organized with the peer collaboration method and having non-equivalent initial groups. In this class, the prerequisite affected significantly the students' performance, though they never determined important differences among the groups. Moreover, the students' previous knowledge did not strongly affect the final test results against the groups factor, as also confirmed by the post-hoc analysis. It was noticed a leveling of the initial differences existing among groups, but the trend of the final test (graph 3) is basically the same as the initial one related to the pre-test (graph 1). The only affecting feature was the parameter mutuality (table 21). This is a sign that through interactions with peers having the same initial background, an improvement in learning the specific topic occurred.

- When dealing with those topics in which the students had rather poor previous knowledge, the peer tutoring resulted the most effective interactive structure. In fact in this case, in order for learning to happen, it is necessary that the learner radically changes the pre-existing relations among his/her mental scheme so as to build new meaning and to elaborate new representations in line with the newly-presented content. Therefore, in this situation, learning the new concepts to be adapted to pre-existing schemes will simply not be sufficient. Instead, it will be necessary to deeply re-arrange the structure of these schemes and to adapt them to the newly-presented situation. Subsequently, the presence of an expert, a guide who helps the student to carry out this "*strong conceptual change*" (Norman, 1982), is essential. The need

for this important re-arrangement allows to analyse the case of class A_3, organized according to the peer collaboration method, from a different point of view. With equal previous knowledge (almost none) on the topic, the best groups were those who had a good level of preparation in the prerequisites and showed high scores in the mutuality parameter. On the contrary, those groups whose initial level was low, did not manage to acquire the addressed content autonomously. Therefore, no relevant improvement, in relation to their initial knowledge, occurred. The absence of a skilled member who could help them re-organize the structure of their knowledge might be the reason for this failure.

4.1.2 Analysis of the experience

The possible socio-relational interactions found during the application of the three cooperative methodologies - peer tutoring, cooperative learning and peer collaboration - are analysed in this section along with the behaviour and the emotions shown by the students involved. As the classes were at their first experience, some problematic situations are likely to have occurred. The observation and analysis of such events might help further researches and applications.

During the first activities, the students appeared to be interested in the new working methodologies. Almost all the students worked in their own group offering a personal contribution to the debate and interacting with other members in a positive way. However, some complications were noticed in this initial phase, first of all time management. Despite an accurate scheduling, the students did not always meet the deadlines, even when pushed. Zan (2007) affirms that often poor management is caused by lack of *control processes*. The control processes correspond to the crucial decisions an individual takes during the activity of problem solving. These crucial decisions refer, for instance, to *"assicurarsi della perfetta comprensione del problema prima di intraprendere un piano d'azione, pianificare, mantenere il controllo di come procedono le cose durante la risoluzione (in particolare decidere cosa fare e quanto tempo riservare ai vari tentativi), distribuire bene le proprie risorse"*[107] (therein, p. 162). The attempts (in solving the problem) applied by the groups, indeed, did not seem to be very strategic.

It was observed, through the video recordings, that students paid little attention to the reading and comprehension of the text. Apparently, no work design or time planning was established as well as no awareness of the "mathematical tools" available to reach a punctual solution was clear. Such shortcomings in the control processes are probably due to the students' lack of experience in facing problem-solving situations. Indeed, many typologies of behaviour, usually adopted by students in front of school problems, were observed, as already codified by Malara (1993, p. 228):

- Inaccurate reading, analysing or commenting on the text (being not used nor motivated to doing it).
- Operating on the numerical values directly and identifying data with these values.
- Solving a problem without explanation of the procedure followed, rather finding this request strange or superfluous.
- Not going beyond the text, in a situation of difficulty, or carrying out meaningless mathematical calculation.

Such methodological problems, inherent to the approach of a difficult mathematical text/problem, were inevitably added to the students' shortcoming in the socio-relational competences. These typologies of behaviour are the following: difficulty in communication, intolerance to criticism,

[107] *"Making sure the problem has been perfectly understood before adopting any action plan; planning and keeping control of the events during the resolution (in particular, before deciding what to do and how much time has to be allocated to each try), distributing the resources correctly".* English translation by the author.

arguing, marginalization of single elements, etc. This behaviour was found mainly within the control phase of role management. Neither role rotation nor the functions described were punctually respected. In some cases it was simply a superficial comprehension of the tasks; in others, circumstances brought some students to overshadow their workmates, carrying out tasks not included in one's own role. For instance, in the peer tutoring case, in some groups the tutors often abused their position in relation to the subject, neglecting the assigned management roles. The tutees' submissive behaviour was justified in that, since they did not feel able to satisfy some expectations, they often left all the work management in the tutors' hands. In the case of peer collaboration many students, once they understood the activity, pushed in every possible way to work individually and not on the single task assigned to the group. They did not realize that the comprehension had stemmed from the reciprocal dialogue and that, for this reason, there was no need to rush, leaving behind those who did not understand. This behaviour might come from the long rooted habit of working individually or, even, with a competitive feeling towards peers.

Similarly, some examples of fusional deviation emerged in all classes where members of the same group focused exclusively on interpersonal relations, regardless the task and at the expense of the result. This was predictable, since the students had never faced these controversial situations before.

Another problem which came up through this experience, is the fact that the most skilled students did not accept the new work mode. Some of these students saw their "status" endangered. They, indeed, moved some criticism against the new mode and tried to hinder them, rather than focus on the advantages offered by the new arrangement. For instance, one class group organized according to the peer collaboration method and made up of students who had obtained an excellent result in the pre-test described the experience as follows:

Student $_1$: *"In my opinion* [cooperative learning] *requires a lot of commitment because several minds enter into dialogue. However, it was not effective because I am personally the type of person who likes elaborating ideas individually. When I work in a group there is more confusion and I cannot concentrate well".*

Student $_2$: *"*[I felt] *ignorant, because I could not learn the concepts"*.

Student $_3$: *"When I was the presenter and we did not understand how to execute the exercise, I felt embarrassed and I clearly found it hard. During the group discussions I felt stupid because some groups understood, while we needed to ask for a second explanation".*

Student $_4$: *"Sometimes* [I felt] *bored and some others interested, it depended on the activities and on how involved by mates and teachers I was".*

The group was immediately criticizing, rejecting and giving up; this behaviour was counterproductive and, probably, it prevented them from reaching the expected results.

In more than one occasion, the fore-mentioned problems arose. Fortunately, such behaviours faded away during the experience, also thanks to a re-negotiation of class social norms (see Cobb and Yackel, 1996) set together with the teacher. At the end of the experience, the class discussions – occurred after handing in the final test results – confirmed the previous observations. Despite the issues above mentioned, most of the students were eager to repeat the cooperative experience in the future, including the case of teaching-learning of physics[108].

The analysis of questionnaires answers allowed us to highlight some important qualitative aspects, whose influence is independent from the result reached in the final test, being the former submitted before delivering the final assessment.

[108] The teaching of physics is often assigned to the mathematics teacher, in case he/she has a A027 "*Physics and Mathematics*" (ex A049) teaching qualification.

A good part of the students recognized how each of the three methodologies require a higher level of effort as compared to a traditional lecture, as the analysis of the open-ended questionnaires shows, often linking their answers to the responsibilities each group member took. If this happens, a higher efficiency will be guaranteed, as more than half of the sample stated. Most of the students affirmed they felt involved during group activities, whereas few of them felt uncomfortable or lost. Some students experienced variable feelings: if the group was confident with what was being done, they would feel positive feelings, otherwise they would face discomfort. Among the most appreciated aspects were the opportunity to talk about possible doubts and misunderstanding, as well as the chance to get to know each other better while working together. Conversely, discomfort was more related to the planning of the mathematical activities "by discovery" rather than on the cooperative strategy adopted[109]. With regards to this it is important to notice how this discomfort mostly arose among the youngest students, that is those who were studying linear functions. The most frequent "leitmotiv", emerged in the final discussions, was the fact of not being able to have an anticipatory formula, from the beginning, to be applied in the resolution of the presented problems, almost confirming that sadly widespread idea of mathematics as a "cold" subject, based only on mechanical calculations (Di Martino e Zan, 2010; Zuccheri e Zudini, 2012).

The class discussions, at the end of the lecture, were led by the writer and represented a very important moment, in which the amount of knowledge dealt with during the group work was formalized. In case this phase had preceded the activities, the students would have not gained any knowledge, as suggested by the students themselves. The learner has to accept the so-called *devolution phase*, which means he has to take responsibility of the resolution of the problem assigned, accepting the implied difficulties, divested of its didactic nature (D'Amore, 1999, pp. 76-82). However, the complaints were symptomatic of the paradox which is created during this phase, as described by Brousseau: "*se [l'allievo] accetta che l'insegnante gli insegni i risultati, non li stabilisce lui stesso e dunque non apprende la matematica, non se ne appropria. Se, al contrario, rifiuta ogni informazione da parte dell'insegnante, allora la relazione didattica è rotta. Apprendere, implica che egli accetti la relazione didattica ma che la consideri come provvisoria e si sforzi di rigettarla"*[110] (1986, p. 66). In order to deal with such diffused complaints, the natural step was to make students aware of such "trap" and of the complexity of the chosen didactic methodology which represents, according to Sarrazy, "*al tempo stesso il fondamento e la condizione del funzionamento del processo di insegnamento-apprendimento"*[111] (1998, p. 146). Nonetheless, such piece of information was not always successfully conveyed nor were the pre-existing opinions about the teaching of mathematics removed.

The novelty coming from the use of group tests was not always welcomed with the right feeling by students. The considerations which came out spontaneously from the open-ended questionnaires, confirm the high interest in the final marks. We were aware that these tests could become a source of distraction, as forms of "extrinsic motivation" that weaken the student's attention during the learning (Damon e Phelps, 1989). If our intent was to stimulate students to properly study together before the tests, many of them perceived this intention only as another form of numerical assessment (cases of productivism derivation).

On the other hand, working with upper secondary school students long rooted in this idea of school, we decided not to remove completely some types of intermediate assessment from our teaching plan,

[109] This should not be underestimated, since this teaching choice could have a meaningful impact on the arrangement and the success of one of the three cooperative methdologies. For example, different results were observed in relation to the use of tutoring activities for revising topics (Pesci, 2009).

[110] Italian translation by Ferreri and Spagnolo (1994, p. 27). *"If [the student] accepts the teacher teaches him the results, he does not establish them himself and therefore he does not learn mathematics, he does not make it his own. If, on the contrary, he refuses all information from the teacher, then the didactical relationship is broken. Learning implies, for him, that he accepts the didactical relationship but also that he considers it as temporary and does his best to reject it".* English translation by the author.

[111] *"At the same time the foundation of and the conditions under which an effective teaching and learning process is to take place"*. English translation by the author.

since the lack of test could be seen as excessive freedom from daily study. In fact, with this modality, an increase in the mutuality parameter was recorded in group assessment evaluations, against the ones recorded during the formative activities. This implies that a rewarding structure based on the individual evaluation of each member, might create high positive interdependence also at school level, though on a minimal percentage[112].

From the comparison between initial and final results, in all classes an average improvement was observed in the students' perception of the teaching-learning of mathematics, due to the different teaching method adopted as compared to the traditional one. However, also in this case, the most relevant differences emerged among the 3rd grade students, with an increase significantly higher than those observed in the 1st and 2nd grade (table 41). Another interesting feature is represented by a relevant improvement noticed in the comparison between the "before-after" questionnaires in the classes where the peer tutoring mode had been used (table 42). This result, in addition to the success shown in the disciplinary performance, highlights the improvement deriving from using an interactive structure, also in the students' behaviour in relation to the subject. However, more experience is essential in order to detect an accurate comparison among the three settings and to highlight possible cognitive and sociological-relational implications on learning mathematical concepts using a specific cooperative working method.

4.2 Discussion

4.2.1 Report on the results obtained with the current research framework

The results reached in this research confirm those obtained in recent analyses on the application of the three cooperative methods in mathematics, in upper secondary school. In the research carried out by Pons et al. (2014) is stated that the students' previous knowledge is an essential element in the learning process and plays a crucial role when it comes to spotting the most effective interactive strategy to be used when a math lesson is to be organized. In particular, the authors proved "*the existence of a negative correlation between the equality parameter (cooperation, collaboration and peer-tutoring) and the degree of existing cognitive proximity between students' prior knowledge and structure of the learning content*" (therein, p. 833). In the current research the same conclusions are drawn working on two specific didactic units: linear functions and quadratic functions.

In the case of linear functions, the students' previous knowledge was such that they were likely to have good foundations on the topic. In this case, no significant differences among the three methods adopted were seen, which is a similar result to the one found by Pons et al. in the didactic units where the students had already some knowledge.

On the contrary, in the case of quadratic functions, the pre-test results show how the students, at the beginning of the experimentation, had no knowledge about the addressed topics, despite they had partially studied the theory of functions and equations in the first two years. In this case, the peer tutoring methodology proved to be significantly the most efficient one.

It is necessary to notice some differences between the didactic contents present in block no. 2 – named "algebraic" – of Pons et al.'s research and those present in this research. Despite the fact that some similarities exist, Pons et al.'s research included a different subdivision between the previous knowledge and the learning objectives. The former included polynomials and first degree equations, whereas the latter had the previous two elements with the addition of: 2nd degree equations and 1st

[112] For a further insight of this theme in the university context see Serrano and Pons (2007).

degree systems. Furthermore, in the same study above mentioned, the tools used to check the students' previous knowledge differed from those used in this study. Actually, Pons et al. considered the students' marks related to the previous academic year, whereas this work uses two initial tests delivered a week before the start of the experimentation.

Following these observations, we want to highlight that, in the fore-mentioned article, the sample analysed showed to have some partial knowledge already, relatively to the algebraic block. Therefore, there was not any significant difference among the three methodologies within the whole block. Despite these differences, the correlation between the previous knowledge and the equality parameter shows the same trend in both studies.

As for the influence of the mutuality parameter, our results confirm what Pons and Serrano (2015) found, although in a different context[113]. The highest the mutuality the highest the group performance results tend to be, that is *"the richer and more multidirectional the transactions are, the more appropriate the degree of decentration, the support requirements and the adjustment to requests for help are"* (therin, p. 312). Despite being the mutuality parameter independent from the equality parameter, its incidence, at a qualitative level, changes among the different interactive structures: peer tutoring, cooperative learning and peer collaboration.

It is important to specify the difference of the concepts analysed in the articles previously quoted, given some recent results which have found significant differences linked to the application of cooperative methods in different subjects (Kyndt et al., 2013). More specifically, mathematics is a subject characterized by a hierarchical structure (Lou et al., 1996) and its content is often propaedeutic to the ones that will be studied in the future. Therefore, when peer interaction is employed, a better learning process is observed in those groups where there are, at least, some students that are well prepared in terms of knowledge (Van Blankenstein et al., 2013). A similar result can be observed in our study. In fact, the average behaviour of the performance found within the three methodologies shows how the peer tutoring method is always the most effective one, followed by the cooperative learning. However, more experimental research is still needed in order to confirm this hypothesis.

4.2.2 Final thoughts and future perspectives

The difficulties teachers and students can encounter the first time a cooperative method is employed within Italian schools are innumerable (Pesci, 2003; 2004; 2006). The choice of one of the three methods (peer tutoring, cooperative learning, peer collaboration) definitely brings about a differentiation in the way initial training is managed on manifold aspects: communication, management roles, social skills, etc. (Sharan, 2014). This selection must take into account the students' previous knowledge on the topic and how it could affect the quality of interactions among students, as identified through the mutuality parameter. For instance, in the case of peer tutoring the dialogues could be qualitatively different as compared with those developed in the peer collaboration method. This diversification might depend on the different influence that the single items, which characterize the observation scale, have in the interactive structures. This matter represents the next step that has to be faced in future researches related to this area.

Moreover, the observation of socio-relational behaviours performed during the application of these peer interaction methods showed how there could be some behaviours characterizing each of the three approaches.

[113] Pons and Serrano (2015) research was carried out in the university context and was related to the course "Psychology of Instruction".

In cooperative learning teams the biggest difficulties were found in the management of roles and in some particular *pairings*. It would be interesting to see the effects of the "jigsaw" technique, which was not used in this case.

In peer collaboration teams the issues were similar to those emerged in cooperative learning teams. Moreover, the impossibility of splitting the work among the members caused discontent, anxiety and worries in many occasions, not only for the group assessment, but also during the everyday teaching activities.

In peer tutoring teams, there were issues regarding the observance of the socio-relational roles – different from the roles of the method itself, i.e. tutor/tutee – and some episodes of *productivity deviation*, often degenerated into a *polarized situation* in the teams with two tutors.

As already reported, in order to achieve satisfying results, these methods should be practiced constantly and for long periods, gradually inserting new management instructions and functions, according to the issues that arise each time. Being this a first experience, the present analysis is affected by its newness. If, on the one hand, this quality has been praised by some students, on the other hand it would be useful to analyze their interactions after they have grown accustomed to the practice, order to deduce *"una comprensione più profonda dell'atteggiamento complessivo che il metodo stesso richiede per essere davvero efficace"*[114] (Pesci, 2006, p. 8).

The results here exposed represent another step in determining the incidence of the parameter equality on the learning of specific mathematical contents in upper secondary school, keeping in mind all those variables which could change the effect. The effectiveness of such a mode might vary also on the basis of the mathematical content considered, whenever the required knowledge and competences are different from the ones addressed in this study (think about the analysis of the concept of geometry or probability). This observation is not granted at all since there are several studies related to the universal use of cooperative methods, but not designed for the specific teaching-learning of mathematics in upper secondary school. Besides, an investigation on how personal interactions might affect or change students' impressions on the study of this subject would be very interesting, especially in students from the so-called "weak upper secondary schools", where mathematics is not a major subject in the syllabus.

Further research on the topic could make the reference framework clearer and would ease the work of all the teachers interested in experimenting and adopting these methods in their daily practice.

[114] *"A deeper comprehension of the overall attitude that the method itself requires in order to be actually effective".* English translation by the author.

APPENDIX A

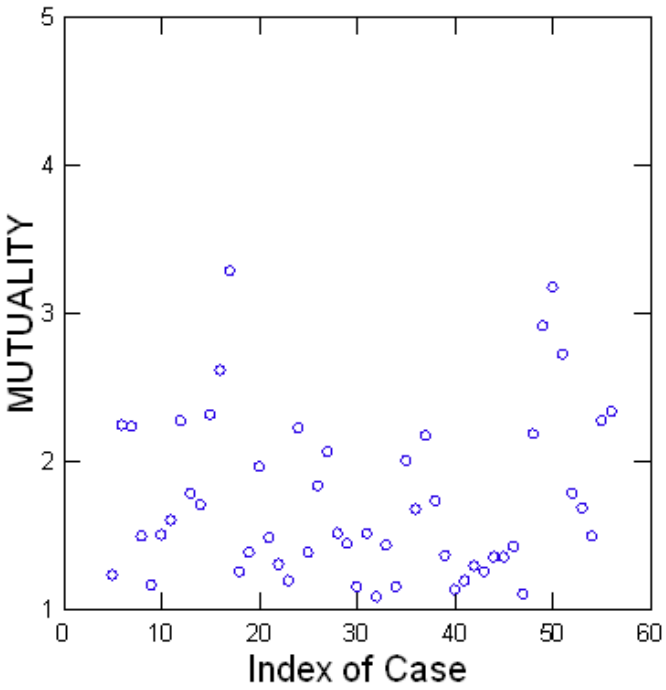
Analysis of the mutuality parameter

Appendix A.1: Observation scheme of the mutuality parameter

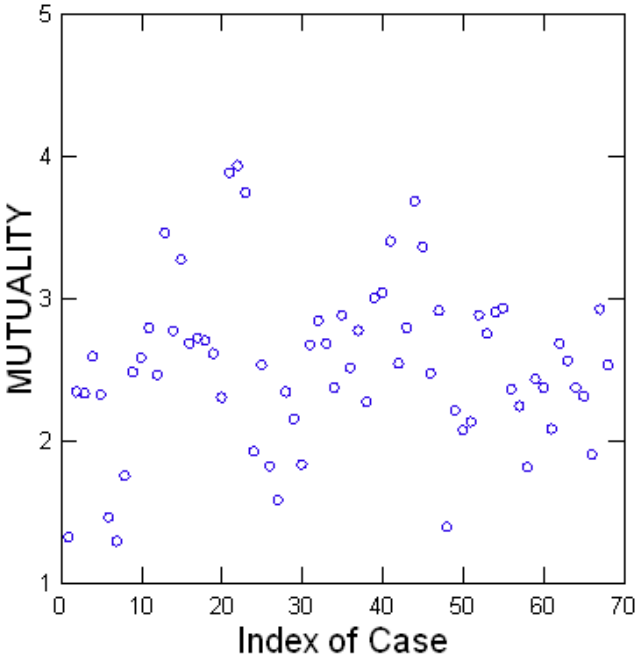
Activity No. ____ - Exercises No. ___	*reader*	*mediator*	*writer*	*presenter*
	student 1	student 2	student 3	student 4
Being responsible of one's own role, respecting the assigned tasks.				
Expressing the understanding of the activity, task and assignment during the approach, process and production steps.				
Asking (spontaneously or not) for explanations on the content (concepts, interpretations) and on the objectives of the activity assigned.				
Providing (spontaneously or not) explanations on the content (concepts, interpretations) and on the objective of the activity assigned.				
Asking (spontaneously or not) for explanations on different aspects of the resolution process of the activity.				
Providing (spontaneously or not) explanations on the different aspects of the resolution process of the activity.				
Asking (spontaneously or not) for explanations on different aspects of the obtained final results and its possible implications.				
Providing (spontaneously or not) explanations on the different aspects of the obtained final result and its possible implications.				
Accepting and respecting the decision taken by the group, on the obtained result.				
Taking into consideration others' opinion.				
Speaking in a critical but constructive way, on one's own and others' argumentations and considerations.				
When speaking, attempt to reach an agreement point with the others, to reach a point of shared knowledge.				

Appendix A.2: Graphs of the students' value concerning the mutuality parameter

Case: linear functions



Case: quadratic functions



APPENDIX B

Questionnaire

Appendix B.1: Initial attitude questionnaire

Name: _____ Surname: _____
School: _____ Class: _____

Please indicate with one "X" only the extent to which you agree or disagree with the following statements:

STATEMENTS	**Totally Agree**	**Partly Agree**	**Partly Disagree**	**Totally Disagree**
I feel I lose focus when dealing with maths problems.				
Solving math problems gives me a sense of satisfaction.				
I'm bored during maths lessons.				
Maths is among my favourite subjects.				
The math I'm studying at school will not be useful in my life.				
Understanding mathematics is useful for many reasons.				
I like studying maths outside class hours.				
If I could, I would not study maths at school.				
I'm scared of maths.				

1) Are there any classmates you have consulted with on matters concerning maths (studying, exercises, concepts you have not understood, supplementary study, …)? If yes, who?

_____
_____

2) In a group activity, what classmates would you like to work with? (Name 3 people max.)

_____
_____

3) Which classmates would you like practice, try and solve math problems and exercises with? (Name 3 people - At least one must be different from those indicated in the previous question)

_____
_____

4) During a mathematical discussion, which classmates do you feel most distant from? (Name 3 max.)

_____
_____

Appendix B.2: Final attitude questionnaire

Name: _____ Surname: _____
School: _____ Class: _____

Here at the end of this experience of group work in mathematics, you will again indicate **with one "X" only** the extent to which you agree or disagree with the following statements:

STATEMENTS	**Totally Agree**	**Partly Agree**	**Partly Disagree**	**Totally Disagree**
During group work, I feel I lose my focus when dealing with math				
During group work, solving math problems gave me a sense of				
I got bored during maths lessons.				
Maths is now among my favourite subjects.				
The math I studied at school will not be useful in my life.				
Understanding mathemathics has been useful for many reasons.				
I liked studying maths outside class hours.				
If I could, I would not study maths at school.				
Maths scared me.				

Appendix B.3: Open-ended questionnaire on the Peer Education experience

1. Many argue that cooperative learning requires more commitment but is more effective: what is your opinion after your experience?

_____
_____
_____
_____

2. How did you feel during the group work?

_____
_____
_____
_____

3. What do you think about class discussion at the conclusion of group works? How did you feel during the various discussions?

_____
_____
_____
_____

4. What did you like the most about this experience? Why?

_____
_____
_____
_____

5. What did you like the least about this experience? Why?

_____
_____
_____
_____

6. Do you have any extra considerations to add?

_____
_____
_____
_____

7. From 1 to 10, how would you grade this experience? Mark it with an "X".

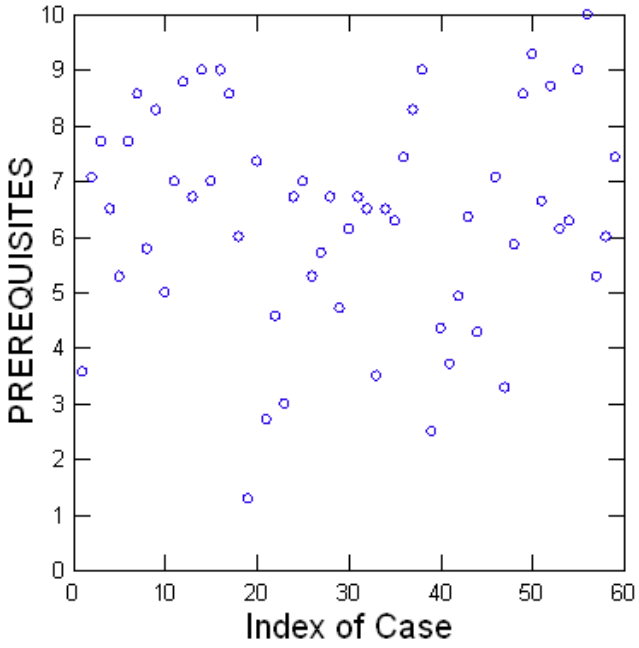
1	2	3	4	5	6	7	8	9	10

APPENDIX C

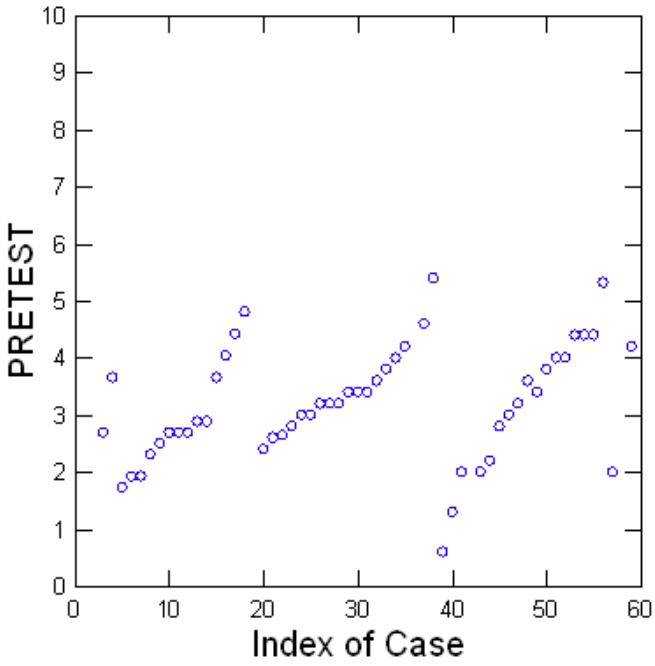
Linear functions unit

Appendix C.1: Didactic material

Appendix C.1.1: Students' prerequisites test results graph on linear functions



Appendix C.1.2: Students' pre-test results graph on linear functions



Appendix C.1.3: Linear functions prerequisites test

Name: _____ Surname: _____

School: _____ Class: _____

1) What is the corresponding decimal number to the following fraction: $\frac{2}{5}$?

_____

2) Which one is the greatest among these numbers? Circle che correct answer.

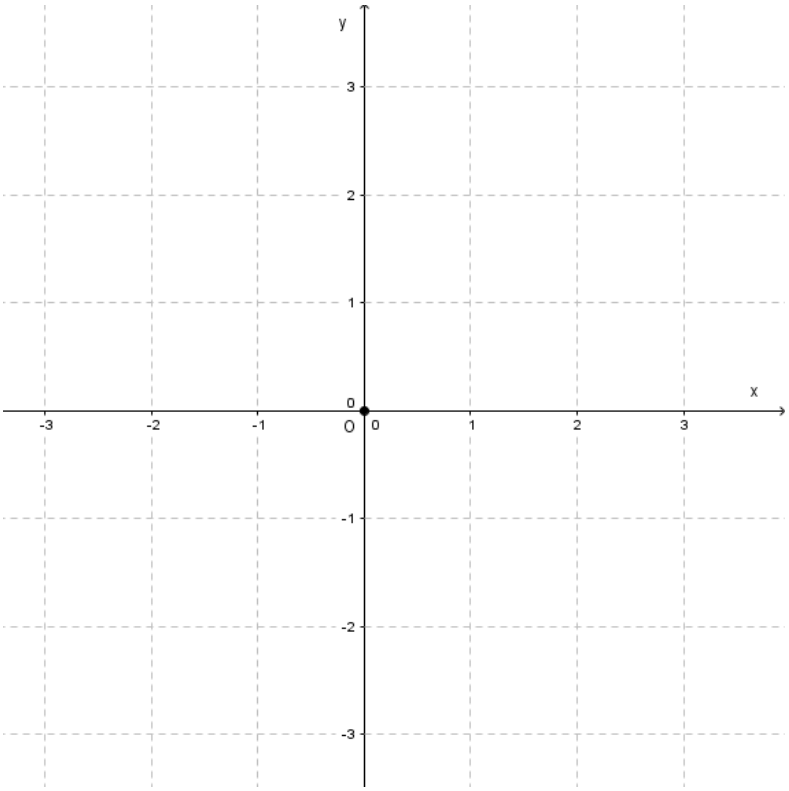
0.5 0.490 0.499 0.059

3) What equals to $(0.1)^2$?

_____

4) Find the following couples of points (x, y) on the Cartesian plane:

A $(-3;\ 3)$
B $(-1;\ 0)$
C $(0;\ 0{,}5)$
D $(0{,}5;\ -\frac{3}{2})$
E $(3;\ -1)$



5) Represent the set A of even numbers comprised between 3 and 17 with all the methods you know.

_____

6) What equals $-1 - 2 \cdot 3$?

_____

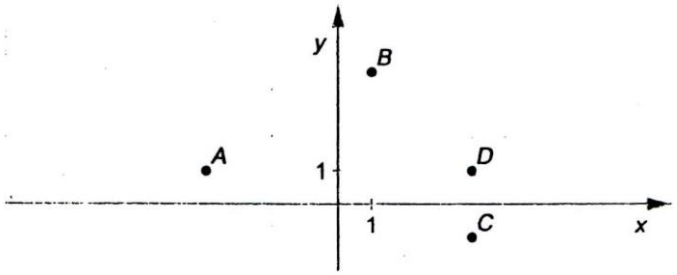
7) What equals -2^4?

_____

8) Which is the greatest fraction among these? Circle the correct answer.

$\frac{3}{4}$ $\frac{4}{3}$ $\frac{11}{12}$ $\frac{5}{3}$

9) Which one of the points below has the coordinates (4, 1)?



_____

10) What equals $-2 + 3 - (-5 - 7)$?

_____

11) What equals $\frac{3}{5} + \frac{1}{7}$?

_____

12) Since *a* is negative number, which of the following expressions represents a positive number? Circle the correct answer.

$(-a)^2$ $-(a)^2$ $(-a^2)$ $-(a^2)$

13) A wooden board is divided into two parts, with one being the half of the other. Which fraction of the whole board corresponds the smallest part?

_____

14) List all the elements of the following set:

$$A = \{x \mid x \text{ is a consonant of the world "ascensore"}\}$$

_____

Appendix C.1.4: Linear functions pre-test

Name: _____ Surname: _____

School: _____ Class: _____

1) What is a function? What is its purpose? Write down its definition and provide an example of your choice.

_____
_____
_____

2) In December 2012, two phone companies proposed the following tarrifs for mobile phones contracts[115].

	Minuti settimanali gratuiti di telefonate verso fissi o mobili inclusi nel costo fisso	Costo fisso (€)	Costo al minuto per i minuti di telefonate oltre quelli gratuiti (€/min)
Compagnia B	200	12.86	0.16
Compagnia C	100	17.14	0.10

Complete the following table:

Weekly minutes used	**0**	**100**	**200**	**300**
Cost with company B	12.86	12.86		
Cost with company C	17.14	17.14		

3) Given the function $f(x) = x - 1$, complete the following equalities:

- $f(2) =$
- $f(-3) =$
- $f(\quad) = 6$
- $f(\quad) = -\frac{1}{2}$

4a) Given a generic linear function $f(x) = x - 1$, what does its graph represent on the Cartesian plane?

_____

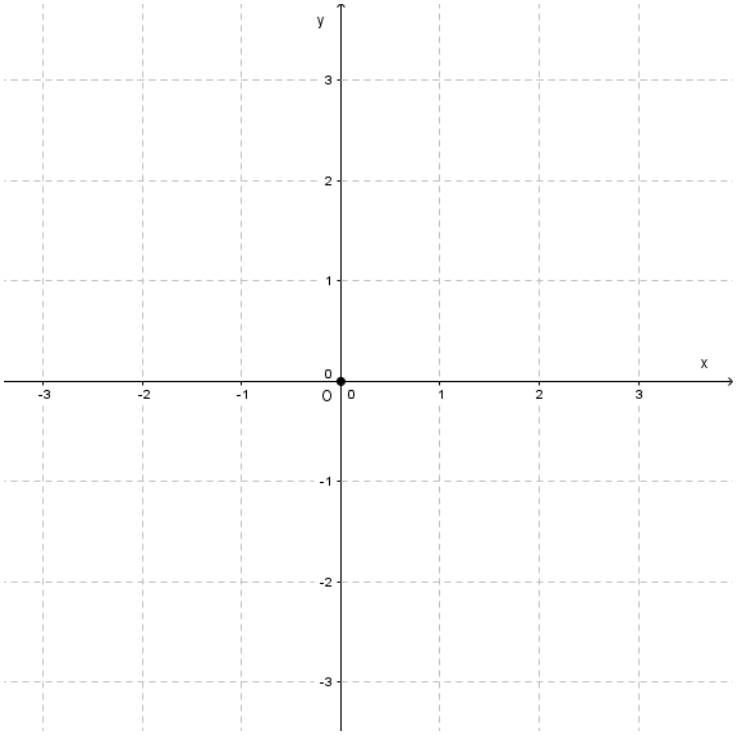
[115] "Compagnia B" means "Company B", "Compagnia C" means "Company C".
Column 1 means: Free weekly minutes for calls to landlines or mobiles included in the fixed cost.
Column 2 means: Fixed cost (€).
Column 3 means: Cost per minute for minutes exceeding the free min. (€/min).

4b) What is the graphical meaning of the coefficients *m* and *q*?

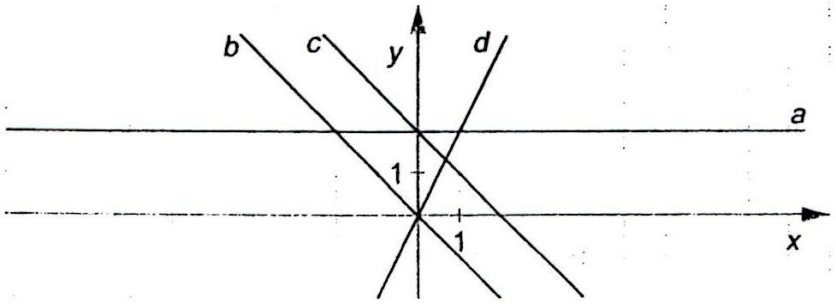
Coeff. *m*: _____
_____

Coeff. *q*: _____
_____

5) Draw the graph of the linear function $f(x) = 2x - 1$, indentifying specifically the coordinates of the intersection points of the graphs with the x-axis and the y-axis.



6) In which of the lines *a*, *b*, *c* and *d* are the coordinates (x, y) of the points liked to the relation $y = 2x$?

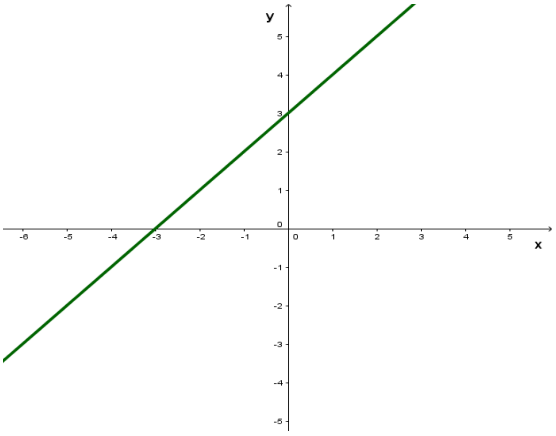


_____

7) Solve the following equation <u>algebraically</u>: $2x - 4 = -2x + 1 - 2 \cdot (x + 3)$. Illustratte the steps of the solution you have followed and comment the final result:

_____
_____
_____

8) Observe the graph of the linear function $f(x) = x + 3$ below. For which values of x is the function positive, negative or null?

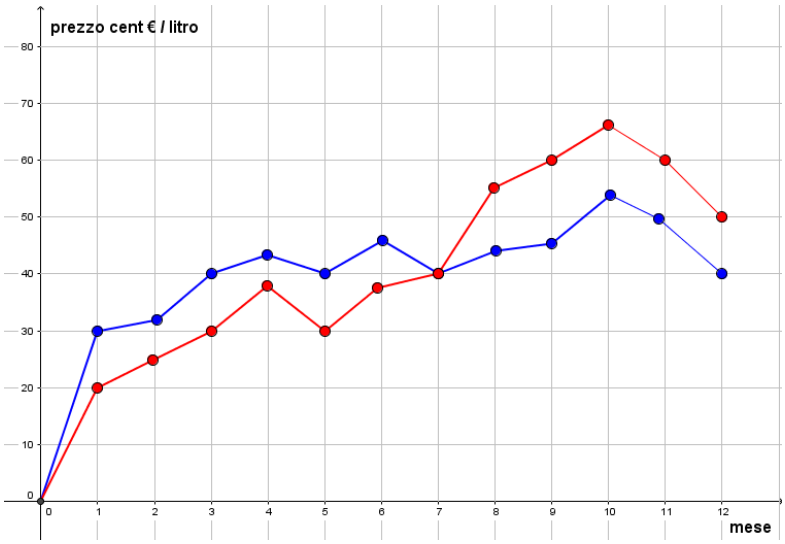


Function $f(x) = x + 3$ is positive for: _____
Function $f(x) = x + 3$ is negative for: _____
Function $f(x) = x + 3$ is null for: _____

9) Solve the following inequality <u>algebraically</u>: $-2x + 12 < 6 \cdot (x - 2)$. Illustrate the steps of the solution you have followed and comment the final result:

_____
_____
_____

10) The following graphs[116] represent the variation of the price (expressed in euros) of a litre of water of the "blue" brand and of the "red" brand, over a period of 12 months.



Answer the following questions:

- Mark on the diagram above the points of intersection between the two graphs.
- In which month did the two brands have the same price?
  _____
- In which months has the blue brand been more expensive than the red one?
  _____
- In which months, on the other hand, has the red brand been more expensive than the blue one?
  _____

[116] "Prezzo cent € / litro" means "Price € / liter". "Mese" means "month".

Appendix C.1.5: Linear functions final test

Name: _____ Surname: _____

School: _____ Class: _____

1a) What is a function? What is its purpose? Give its formal definition.

_____
_____
_____

1b) Can the following table represent the values of a function? Motivate your answer.

x	-4	-3	-2	-1	0	1	2	3	4
$y = f(x)$	2	2	1	-1	0	2	3	4	5

_____
_____
_____

2) In december 2013, two phone companies proposed the following offers for mobile phones contracts[117].

	Minuti settimanali gratuiti di telefonate verso fissi o mobili inclusi nel costo fisso	Costo fisso (€)	Costo al minuto per i minuti di telefonate oltre quelli gratuiti (€/min)
Compagnia B	100	10.08	0.10
Compagnia C	200	15	0.15

Complete the following table:

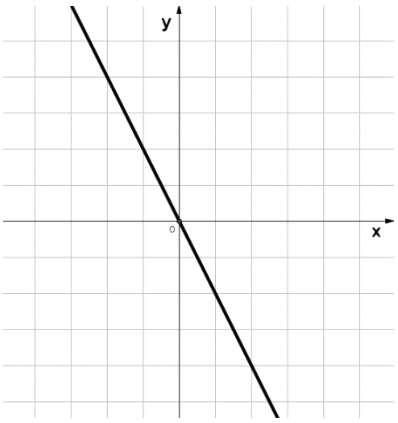
Weekly minutes used	**0**	**100**	**200**	**300**
Cost with company B	10.08	10.08		
Cost with company C	15	15		

Which company will be the most convenient one, if the user knows he/she uses 300 minutes per month?

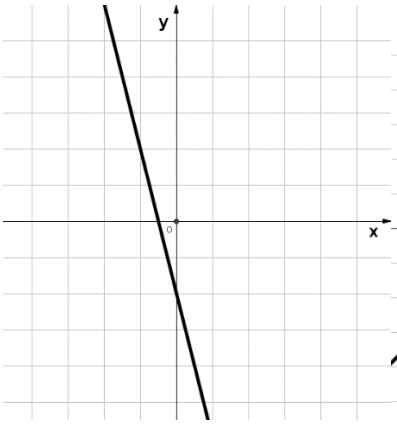
_____

[117] "Compagnia B" means "Company B", "Compagnia C" means "Company C".
Column 1 means: Free weekly minutes for calls to landlines or mobiles included in the fixed cost.
Column 2 means: Fixed cost (€).
Column 3 means: Cost per minute for minutes exceeding the free min. (€/min).

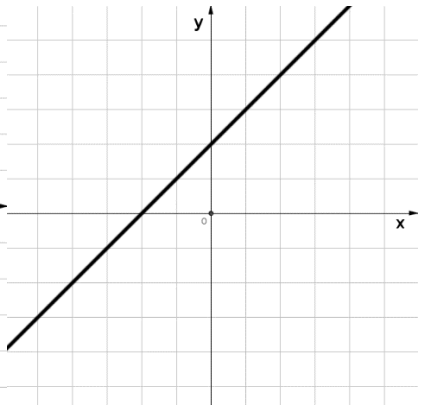
3) For each of the graphs below, mark with <u>only one</u> X the box indicating the sign of coefficient q of the function $f(x) = mx + q$.



□ $q > 0$
□ $q = 0$
□ $q < 0$

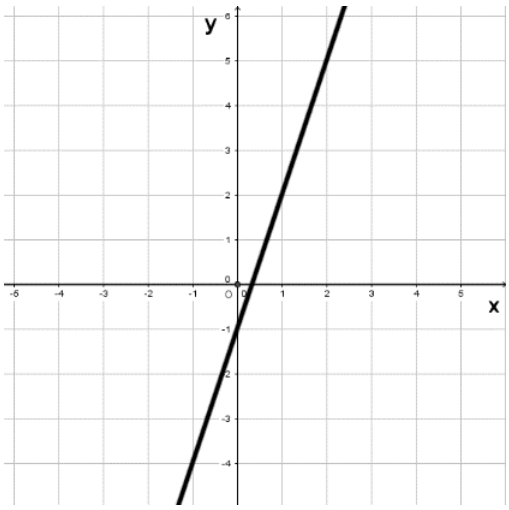


□ $q > 0$
□ $q = 0$
□ $q < 0$



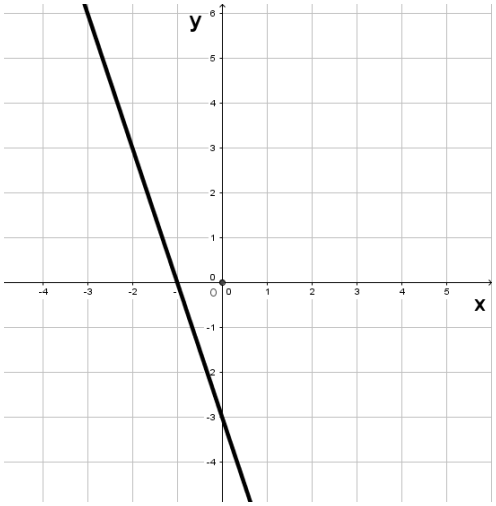
□ $q > 0$
□ $q = 0$
□ $q < 0$

4) Match each of the following lines with its respective algebraic representation.



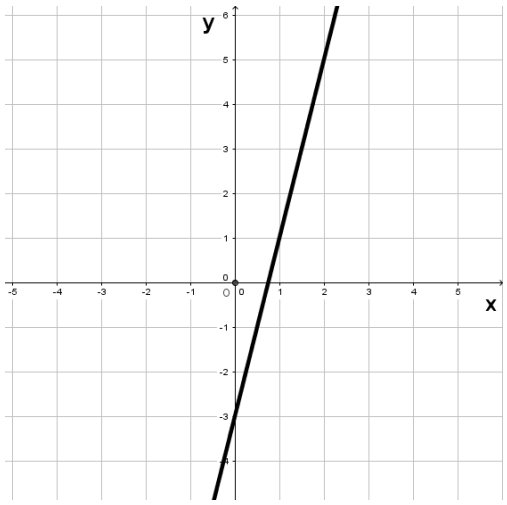
_____

1: $f(x) = -3x - 3$



_____

2: $g(x) = 3x - 1$



_____

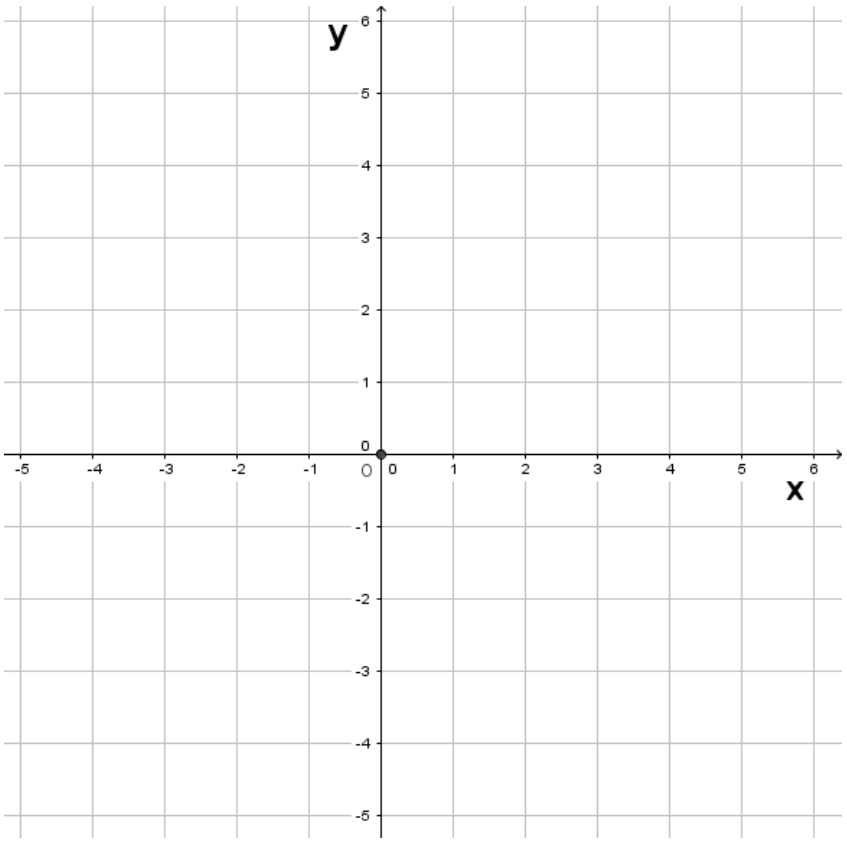
3: $h(x) = 4x - 3$

5) Solve the following equation <u>algebraically</u>: $3 - 2 \cdot (-x - 6) = 12 - (1 - x)$. Illustrate the steps of the solution you follow and comment the final result.

_____
_____
_____
_____
_____

6) Draw the graph of the linear function $f(x) = 3x - \frac{5}{2}$ and determine both <u>algebraically</u> and <u>graphically:</u>

- The coordinates of the intersection point with the *y*-axis;
- The coordinates of the intersection point with the *x*-axis (start by looking for the zero of the function).



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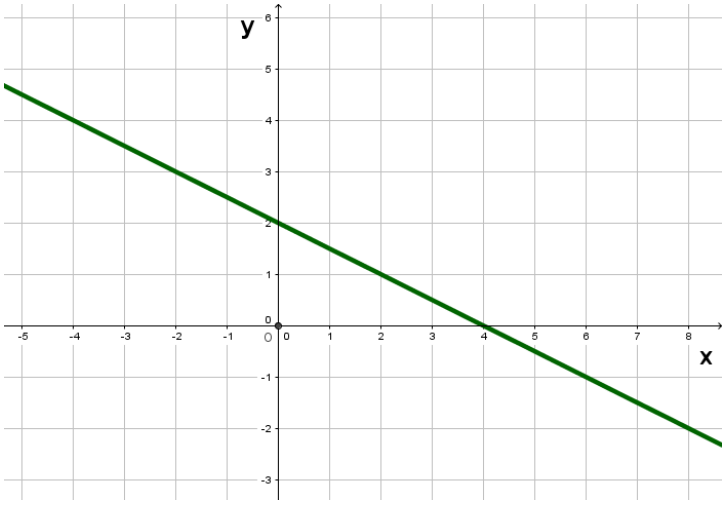
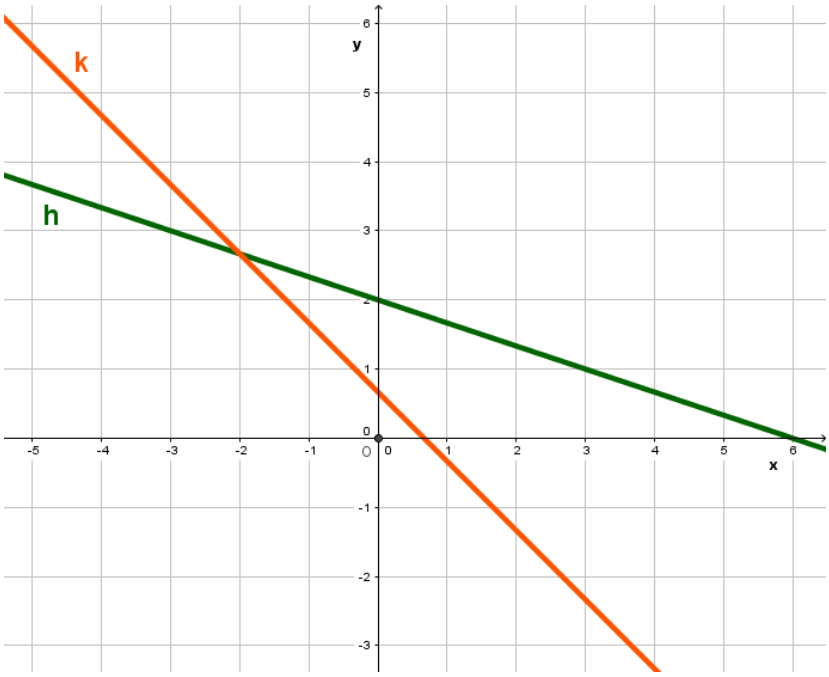
7) Complete the following table deducing <u>only from the graph</u> of the linear function: $f(x) = -\frac{1}{2}x + 2$ for which values of *x* the equations and inequalities written are verified (you may indicate the respective intervals of solution on the graph itself).

Graph of $f(x) = -\frac{1}{2}x + 2$	equ. and inequ.	solutions
	$-\frac{1}{2}x + 2 = 0$	_____
	$-\frac{1}{2}x + 2 > 0$	_____
	$-\frac{1}{2}x + 2 < 0$	_____

8) Solve the following inequality <u>algebraically:</u> $-x + 2 - 2x < 4x - 5 - 6x$ and comment the final result:

_____
_____
_____
_____
_____

9) Observe the graph below, try to compare the linear functions *h* and *k* and answer the following questions:



- Mark the intersection point between the two lines on the graph below.
- For which value of *x* do the two lines intersect?

  _____
- For which values of *x* are the corresponding y, of the points of line *h*, greater than those of line *k*?

  _____
- For which values of *x* are the corresponding y, of the points of line *h*, lesser than those of line *k*?

  _____

Appendix C.1.6: Texts of the ten linear functions didactic activities

Activity 1: Introduction to functions

Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____

Introduction:

The following table shows the variation of the prices (expressed in euros) of certain goods over the time. The data were divided into groups of ten years, from 1950 to 2000.

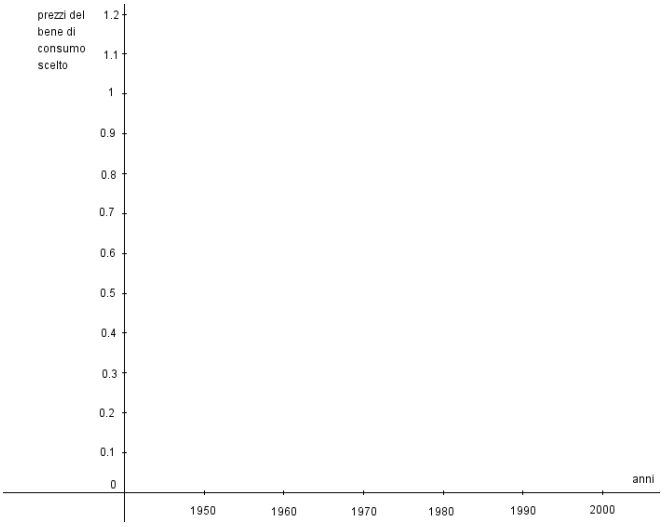
Year	**1 daily newspaper**	**1 kg of bread**	**1 liter of petrol**
1950	0,01 €	0,05 €	0,06 €
1960	0,02 €	0,07 €	0,06 €
1970	0,04 €	0,12 €	0,08 €
1980	0,15 €	0,44 €	0,44 €
1990	0,62 €	0,77 €	0,77 €
2000	0,84 €	1,09 €	1,07 €

Activities:

1) Create a new table of two columns only, with the first column reporting the figures for the years and the second one showing the figures for the prices relating to <u>only one</u> (<u>of your choice</u>) of the goods taken into account.

Year	**_____**
1950	€
1960	€
1970	€
1980	€
1990	€
2000	€

2) Now illustrate graphically in the following diagram[118] the relation between the years and the prices of the good you've chosen during activity 1).



[118] "prezzi del bene di consumo scelto" means "prices of chosen good". "anni" means "years".

3) With the first two activities we have worked on a practical example of <u>function</u>, through the use of several representation methods (tables and graphs). After seeing these first few examples, how would you define a function and its purpose in general terms?

_____
_____
_____
_____

4a) Can the following table show the values of a function? Motivate your answer.

x	-3	-2	-1	-1	0	1	2	3	4
$y = f(x)$	2	4	7	1	0	9	10	11	3

_____
_____

4b) Can the following table show the vlues of a function? Motivate your answer.

x	-3	-2	-1	0	1	2	3	4	5
$y = f(x)$	0	0	0	0	0	0	0	0	0

_____
_____

Activity 2: Saving or not saving?

Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____

Introduction:

Consider the descriptions of the three phone tariffs below: all three seem to have some advantages and disadvantages. Obviously, the choice depends not only on the proposed tariff but also on the needs and the habits of each user. Considering the needs and habits, how can we then identify the tariff which allows us to minimise costs?

Red Tariff: Between 0 and 5 minutes of conversation: fixed cost of 3€;

Blue Tariff: Between 0 and 5 minutes of conversation: 0,80 €/min.;

Black Tariff: Between 0 and 5 minutes of conversation 0,40 €/min.

Activities:

1) Complete the following tables calculating the costs c relative to the following m minute counts, in the [0,5] *minutes interval:*

***NB**: Calculator may be used*

Red Tariff

m	***c***
0	3
1	3
2	
3	
4	
5	

Blue Tariff

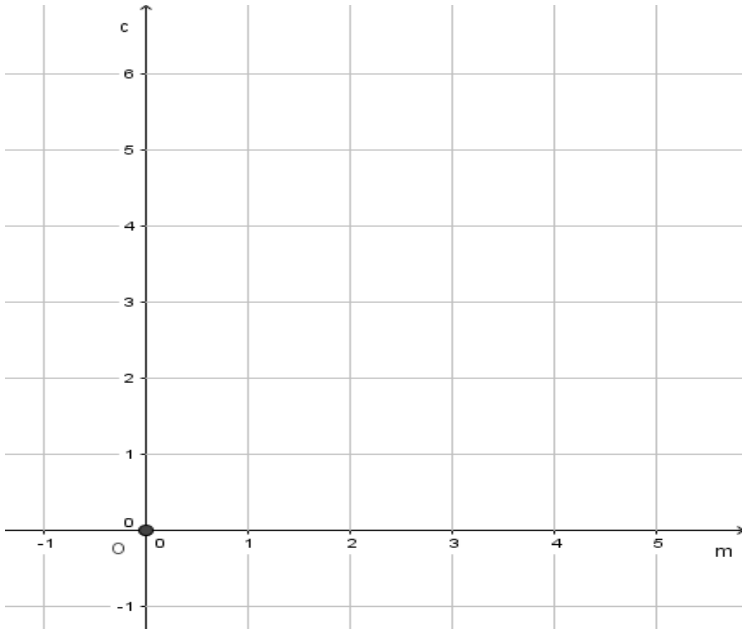
m	***c***
0	0
1	0.8
2	
3	
4	
5	

Black Tariff

m	***c***
0	0
1	0.4
2	
3	
4	
5	

2) Considering, <u>for each tariff,</u> the graph of the relation between the m minutes used (that we shall place on the horizontal axis) and the total c cost (on the vertical axis) <u>in the [0,5] minute interval</u>, draw on the Cartesian plane below the coordinate points (m, c) obtained from exercise 1) and try to connect them.

<u>Hint</u>: *Use three different colours (red, blue, black) in order to mark the graph of each plan.*



3) What peculiarities do you notice in the disposition of the points drawn in each graph? What do they represent graphically?

_____
_____

4) How many points were sufficient to be found in order to draw the plans' graph?

_____
_____

5) On which quadrants of the Cartesian plane are the located points situated? Therefore, do their ordinates acquire a positive or negative sign, <u>in this instance</u>?

_____
_____

Activity 3: Linear functions

Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____

Summary:

Starting from a real situation (the analysis of three phone tariffs), we have come to the study of a set of points called: **straight line**. Many other phenomena can be described by the linear model and for the moment that is why we shall continue to study it from a mathematical point of view only.

Until now we have studied only how to pass from a verbal representation to a numerical one (the table of values), then to a graphical one. We shall now analyse the last kind of representation, the algebraic one.

Introduction:

At least for the moment, only Rational Numbers are taken into consideration[119]. Therefore, every function can be formed starting from the following formula:

$$f(x) = m \cdot x + q \text{ with } m, q \in \mathbb{Q}$$

We shall call this type of function a ***"linear function".***

Definition: *A **linear function** is therefore a function in which every x rational number is made to correspond with the number $m \cdot x + q$, with fixed numbers m and q.*

The domain and codomain of a linear function match with the set $\mathbb{Q}$ of rational numbers. Moreover, we have already seen how to draw a linear function's graph: it is sufficient to define two couples of values $(x; f(x))$, each matching with a point in the diagram.

Problem:

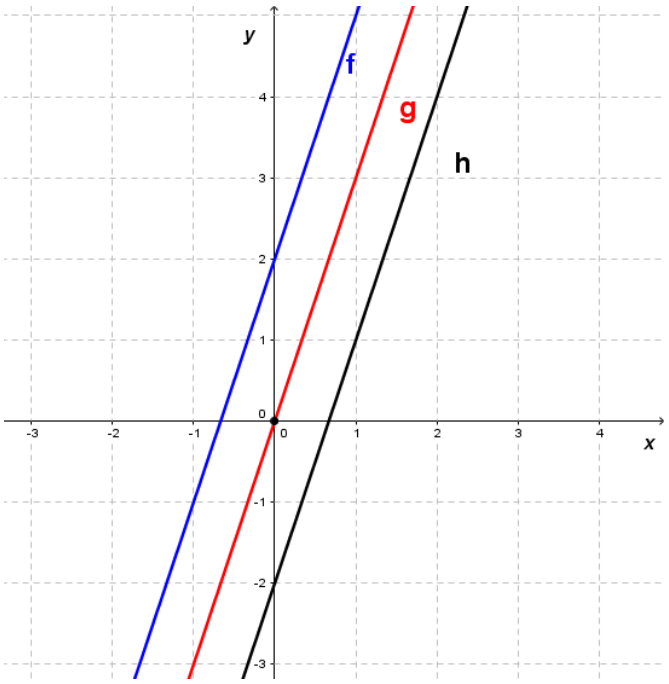
What meaning do the *m* and *q* coefficients acquire graphically? Let's find out together...

[119] Real Numbers are introduced between the first and the second year of upper secondary school. The students forming the unit of analysis of the research had not had any experience with Real Numbers. It has been therefore decided to limit the analysis of the linear functions to the Q set only.

Activities:

1) The graphs of the functions are shown on the Cartesian plane below:

$f(x)=3x+2;$
$g(x)=3x;$
$h(x)=3x-2.$



Which coefficient differs among the functions? What does the coefficient affect and in which way, in the development of the diagram?

_____
_____

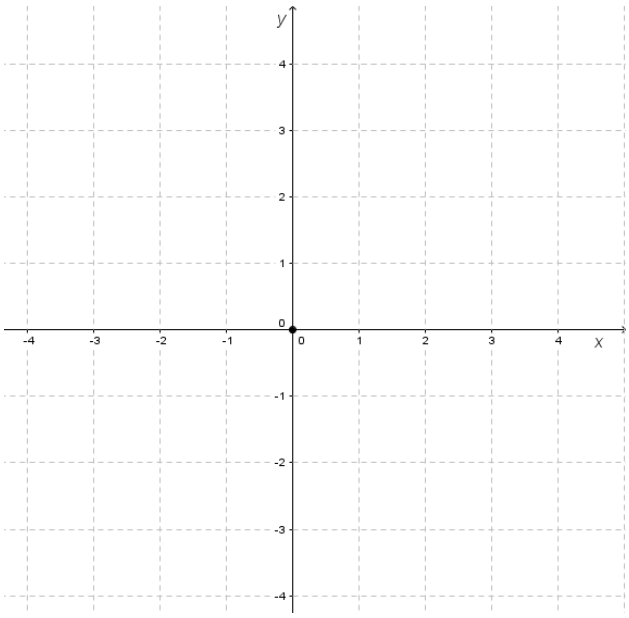
2) Fill in the following tables relative to the values assumed by certain linear functions in relation to certain values of x:

***NB**: the letters of the functions f and g are the same as the previous exercises, but some equations are different!*

x	$f(x) = x$
-2	$f(-2) =$
-1	$f(-1) =$
0	
1	
2	

x	$g(x) = 2x$
-2	$g(-2) =$
-1	$g(-1) =$
0	
1	
2	

3) Draw the linear functions f(x) and g(x) those from exercise 2) in the diagram below:

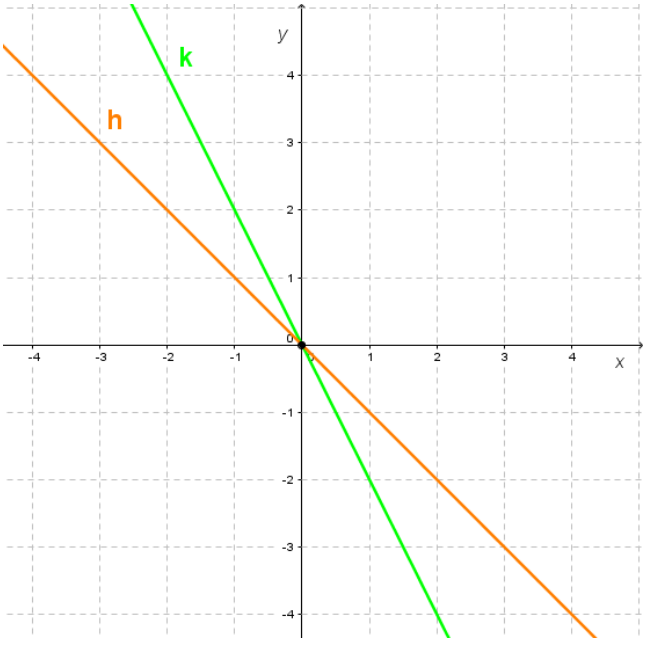


4) The two linear functions that you have just drawn differ by one coefficient. Which one? In what ways could this coefficient affect the diagram?

_____

_____

5) The following Cartesian plane shows the graphs of the functions $h(x) = -x$ and $k(x) = -2x$:



By what coefficient do the two functions differ, in this case? Does it affect the diagram in the same way as in the previous ocase? Describe briefly the differences that you have noticed between the two cases.

_____

_____

Activity 4: The zeros of a linear function

Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____

Summary:

Last time we begun the study of the linear model of this kind:

$$f(x) = m \cdot x + q \text{ with } m, q \in \mathbb{Q}$$

Thanks to the group activities we have carried out so far we learned that:

- The domain and codomain of a linear function match with the set $\mathbb{Q}$ of rational numbers.

- The graph of a linear function is a straight line, which can be drawn on the Cartesian plane by identifying at least two couples of values $(x;\ f\ (x))$ each corresponding to a point on the diagram.

- The graphical meaning of the ***m*** and ***q*** **coefficients**:

- The coefficient represents the **slope** of a line.
- The coefficient represents the **ordinate** of **the intersection point between the line and the *y*-axis.**

Problem:

Among the values of *x* of the domain of a linear function, it may be useful to identify one, if it exists, possessing a special characteristic. Let's find out...

Introduction:

In Italy, thermometers use the Celsius scale which uses the centigrade (°C) as unit of measurement. In the Anglo-Saxon countries a different thermometric scale is adopted, the Fahrenheit, which uses the degree Fahrenheit (°F) as unit of measurement.

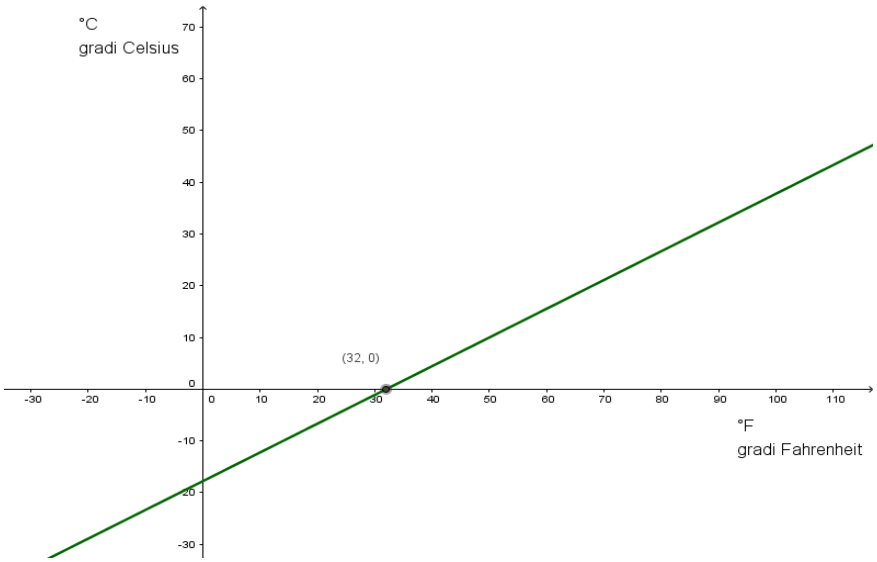
Indicating the degrees Celsius by C and the degrees Fahrenheit by F, the conversion from degrees Fahrenheit to degrees Celsius is given by the linear function $\mathrm{conv(F)} = \mathrm{C}$ defined as $\mathrm{C} = \frac{\mathrm{F}-32}{1{,}8}$ (**NB**: The term "conv" indicates precisely that it refers to a conversion function, although the meaning remains the one from the classic terminology of function: $f(x) = y$).

Activities

1) In the Celsius scale, the freezing point of water at atmospheric pressure is 0 °C. What is the freezing point of water in Fahrenheit degrees?

_____
_____
_____

2) By observing the conversion line given by the "Fahrenheit-Celsius" function, what does it mean to solve the equation $0 = \frac{F-32}{1,8}$ *graphically?*



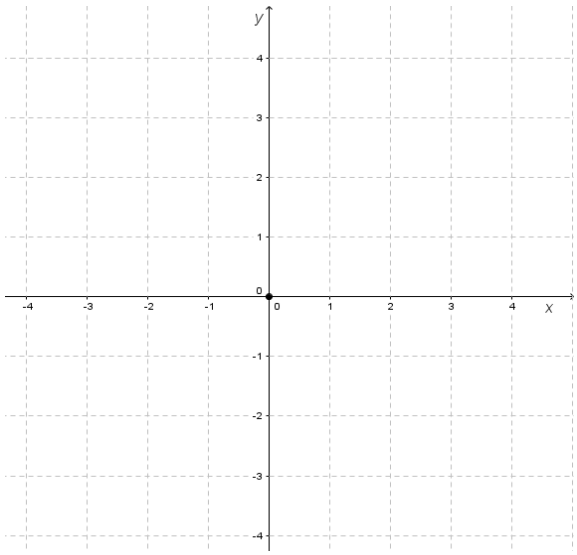
_____

_____

Definition: *The* ***zeros*** *of a function f correspond to all the values of x whose function assumes zero value:* $\boldsymbol{f(x) = 0}$.

3) Given the following linear function, draw their graph and then find their zeros, if they exist, on the Cartesian plane:

$f(x) = 4x + 1$ $g(x) = 3$ $h(x) = 0$



How many zeros does the function f (x) = 4x + 1 have?

_____

How many zeros does the function g(x) = 3 have?

_____

How many zeros does the function h(x) = 0 have?

_____

Activity 5: Linear equations

Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____

Summary:

In the previous lesson we learned that: given a linear function $f(x) = mx + q$ there are two methods to address the problem of determining, **the zeros of *f*,** if they exist,:

- **Graphically:** by identifying on the Cartesian plane, if they exist, the abscissae of the intersection points of the straight line with the x-axis;
- **Algebraically:** by identifying, if they exist, the solutions of the first degree equation in the unknown *x*: $mx + q = 0$.

Problem:

What does it mean, algebraically, to *"determine, if they exist, the solutions of the first degree equation in the unknown x:* $mx + q = 0$*"?*

Definition: *an **equation** of the type* $mx + q = 0$ *is called **linear** in the unknown x. **The solution to an equation** is every number that, substituting the unknown, transforms the equation into a real equivalence.*

Furthermore, in order to determine the solutions we can solve the equation by using the properties of the ordering of rational numbers as follows:

Starting from the equation: $mx + q = 0$ by subtracting *q* to both sides of the equation an equivalent equation is obtained: $mx = -q$ from which, by dividing both sides by *m*, we obtain: $x = -\frac{q}{m}$	*Example:* $2x + 1 = 0$ by subtracting 1 to both sides of the equation an equivalent equation is obtained: $2x = -1$ from which, by dividing both sides by 2, we obtain: $x = -\frac{1}{2}$

Activities:

1) Find, if they exist, the solutions to the following linear equations showing all the passages that you have carried out:

$4x - 2 = 4$ **$5 - x = 3$** **$\frac{1}{2}x + 7 = 4$** **$3x - 1 = 8$**

Activity 6: 1st group test

Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____

Rules:

This activity requires each group to draw the graph of 4 linear function, identify the zeros of 8 linear functions (4 graphically and 4 algebraically) and to solve 4 linear equations.

20 minutes:

The drawing of the graph, of one linear function will be assigne to **each member of the group**, along with the identification of the the zeros of two linear funtions (one graphically, one algebraically) and resolution of one linear equation. These exercises will be carried out individually.

15 minutes:

When the time is up, all members will hand all the papers over to the **reader**. The reader will read and discuss with the group the solutions found. If there are any questions, clarifications, revisions, etc., by any member (therefore also by the reader him- or herself), the **mediator** will pause the reading and will coordinate the discussion in order to reach a common position.

During the discussions, **EVERYONE** will check the correctness of the exercises carried out by their groupmates, as it is useful to fully understand the subject, as well as in view of the individual final test.

Once a common position is reached, the **writer** only will be tasked with writing down:

1 – the possible corrections and/or additions on each paper sheet in a written form;
2 – the final answer shared by each member of the group in three lines.

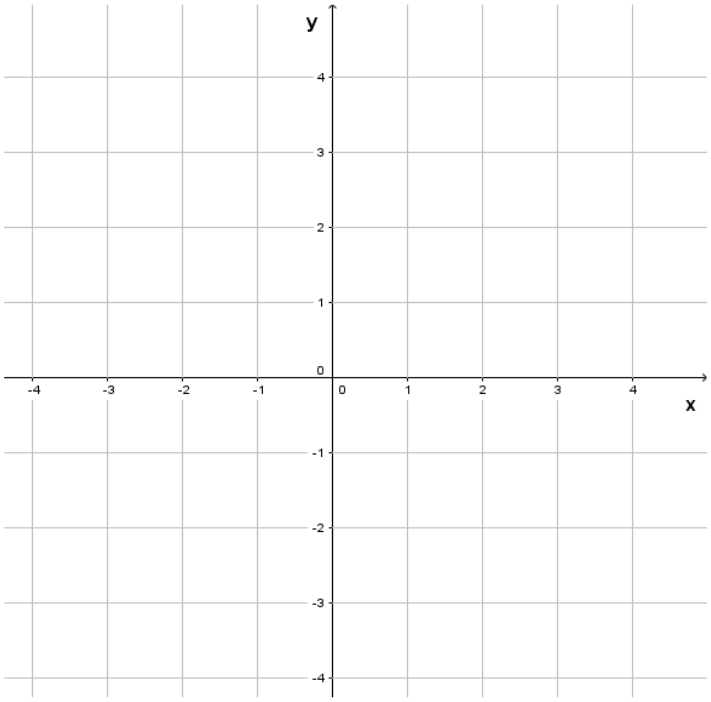
20 minutes:

At the conclusion, each **presenter** will be called by the teacher to describe the results achieved, by his/her group at the end of the discussion, to the whole class.

Good work!

Reader's sheet

- *Plot the graph of the linear function* $\boldsymbol{f(x) = 3 - 5x}$ *and find its zeros graphically:*



- *Find the zeros of the linear function* $\boldsymbol{f(x) = -\frac{1}{2}x - 2}$ *algebraically:*

Writer:

_____

- *Solve the following linear equation* $\boldsymbol{x + 3(1 - x) = 2 + 5x}$ *and comment the final result:*

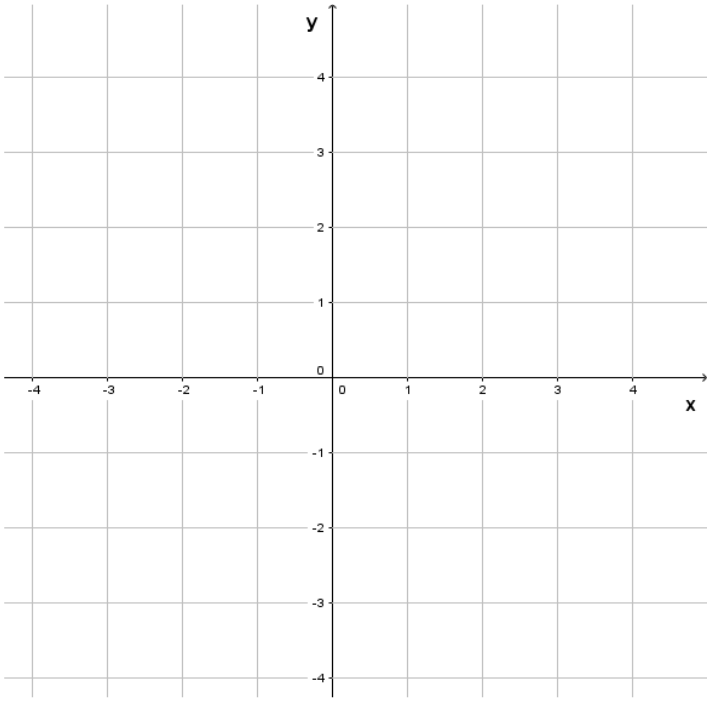
_____
_____
_____
_____
_____

Writer:

_____

Mediator's sheet

- *Plot the graph of the linear function* $\boldsymbol{y = \frac{3}{2}x - 1}$ *and find its zeros* <u>*graphically*</u>*:*



- *Find the zeros of the linear function* $\boldsymbol{f\ (x) = \frac{1-2x}{3}}$ <u>*algebraically:*</u>

<u>Writer:</u>

_____

- *Solve the following linear equation* $\boldsymbol{3 - 2(4x - 3) = x - 3(2x + 5)}$ *and comment the final result:*

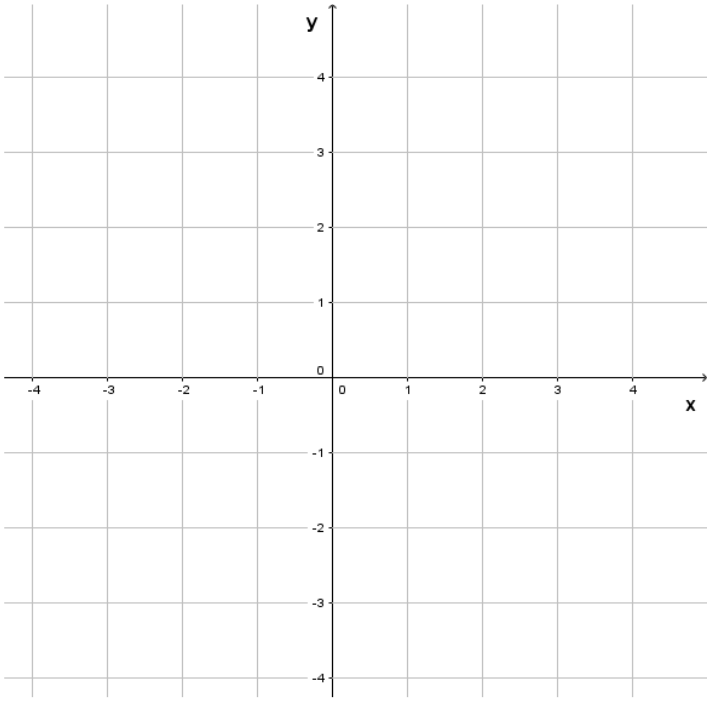
_____
_____
_____
_____
_____

<u>Writer:</u>

_____

Writer's sheet

- *Plot the graph of the linear function* $\boldsymbol{y = \frac{3}{5}x - \frac{3}{5}}$ *and find its zero <u>graphically</u>:*



- *Find the zeros of the linear function* $\boldsymbol{f(x) = \frac{x}{3} + \frac{1}{3}}$ *<u>algebraically:</u>*

<u>Writer:</u>

_____

- *Solve the following linear equation* $\boldsymbol{5(2 + x) = 3(1 + x) - 2z - 4(2 - x)}$ *and comment the final result:*

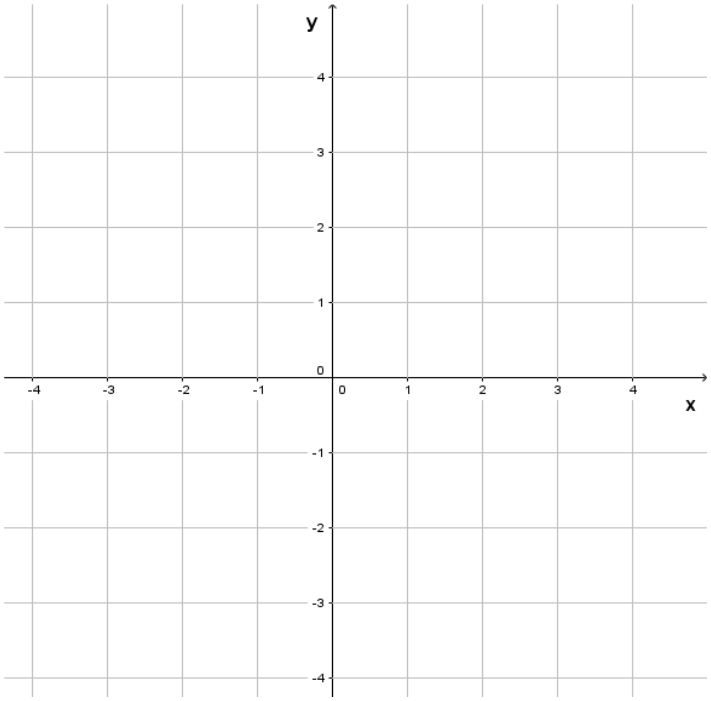
_____
_____
_____
_____
_____

<u>Writer:</u>

_____

Presenter's sheet

- *Plot the graph of the linear function* $\boldsymbol{y = 4 - \frac{3}{2}x}$ *and find its zeros* <u>*graphically*</u>*:*



- Find *the zeros of the linear function* $\boldsymbol{f(x) = -x + 7}$ <u>*algebraically:*</u>

<u>Writer:</u>

_____

- *Solve the following linear equation* $\boldsymbol{(7 - 3x)2 + x = 5 - 3(5 - x)}$ *and comment the final result:*

_____
_____
_____
_____
_____

<u>Writer:</u>

_____

Activity 7: Challenge!

Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____

Problem:

Francis wants to buy a car and has a particular brand in mind, although he is uncertain between two models with very similar characteristics. One is diesel-powered (*Modello G*), the other is gasoline-powered (*Modello B*)[120].

He wants to choose the model that will allow him to minimize the fuel consumption: what advice can you give him relying exclusively on the information in the table?

Modello G	
Prezzo	10 850 €
Consumo medio	16.8 km/l
Prezzo carburante	1.756 €/l

Modello B	
Prezzo	9050 €
Consumo medio	15.1 km/l
Prezzo carburante	1.810 €/l

Hint: How many kilometers does Francis have to travel for model D to be cost effective? In order to answer, you may help yourself by finding the coefficients *m* and *q* of the linear functions that describe model D and model G, then draw their graphs.

[120] "Prezzo" means "Price", "Consumo medio" means "Average consumption", "Prezzo carburante" means "Fuel cost".

Activity 8: The sign of a linear function

Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____

Summary:

During the last activities, we have learned how to plot the graph of a linear function on the Cartesian plane starting from its expression. Indeed, given a generic linear function $f(x) = mx + q$, by now we know that:

- The domain and codomain of a linear function match with the set of rational numbers $\mathbb{Q}$;

- The plot of a linear function is a straight line, which is possible to plot on the Cartesian plane by finding at least two couples of values (x; $f(x)$) both matching with a point of the graph.

- The **slope of the line** depends on the analysis of coefficient m;

- The **intersection with the *y*-axis** is given by the coordinate point (0; q).

- The **zero of a function**, that is the abscissa of the (possible) intersection of its graph with the x-axis, can be obtained by solving the equation: $mx + q = 0$**.**

The last aspect that we have to focus on is the **study of the sign** of a linear function.

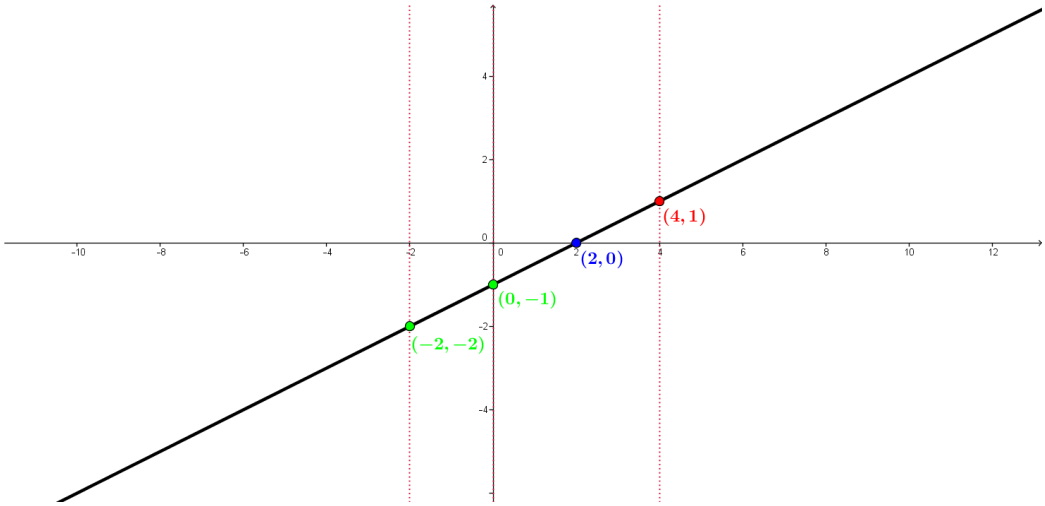
Problem:

What does it mean "*to study the sign of a linear function*"?

Definition: ***Studying the sign of a linear function*** *means to identify for which values of x the function acquires positive values* $(f(x) > 0)$*, for which values of x it acquires negative values* $(f(x) < 0)$ *and lastly for which values of x it acquires a null value* $(f(x) = 0)$.

Activities:

1) Let's consider the fuction $f(x) = \frac{1}{2}x - 1$*, whose graph is plotted below:*



Let's study the sign of this function; we shall begin with some "attempts":

For $x = -2$ *what value does f(x) acquire? Is it positive, negative or null? f(x) equals ___ , therefore is _____*

For $x = 0$ *what values does f(x) acquire? Is it positive, negative or null? f(x) equals ___ , therefore is _____*

For $x = 2$ *what value does f(x) acquire? Is it positive, negative or null? f(x) equals___ , therefore is_____*

For $x = 4$ *what value does f(x) acquire? Is it positive, negative or null? f(x) equals ___ , therefore is_____*

As you can see, in the diagram the intersection point between the line and the *x*-axis has already been identified: *P* (2, 0). We have already learned in the previous lessons how to find its abscissa: we just have to solve the equation $mx + q = 0$ (in our case, $\frac{1}{2}x - 1 = 0$). This value of *x*, if it exists, is the only one in which the fuctions acquires a null value. Therefore, for the exercises we shall remember that, following to this method, we will be able to find (<u>if they exist</u>) *the values of x for which the function acquires null value"* (according to the definition of "study of the sign of a linear function", as with $(f(x) = 0)$.

2) Cosnidering the previous diagram, in order to complete the remaining study of the sign, let's try and take advantage of the intersection of the linear function $f(x) = \frac{1}{2}x - 1$ *with the x-axis in the point of the abscissa* $x = 2$*. For which values of x are the remaining cases valid?*

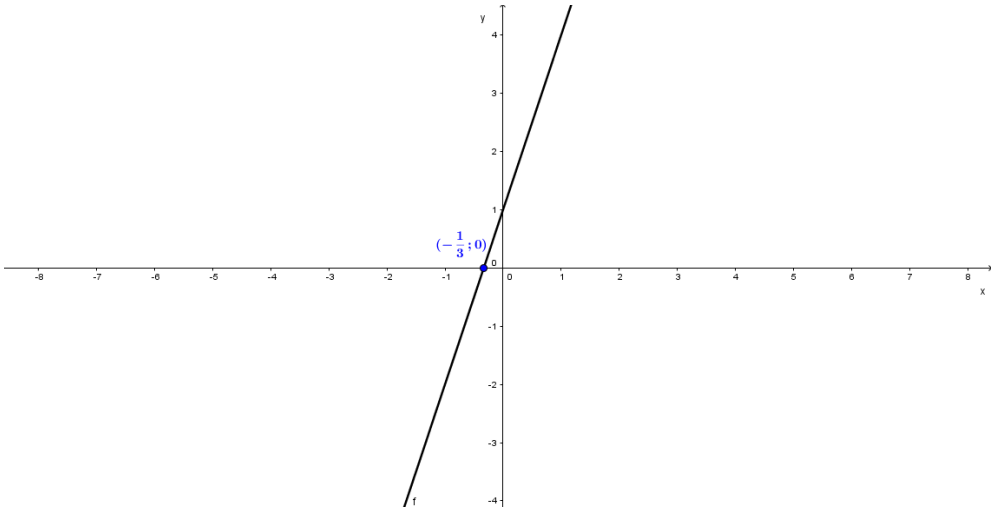
- $f(x) = 0$ *when* $x = 2$*;*
- $f(x) > 0$ *when* _____
- $f(x) < 0$ *when* _____

Therefore, what relation can we identify between the study of the sign and the zero of the function (<u>when it exists</u>)?

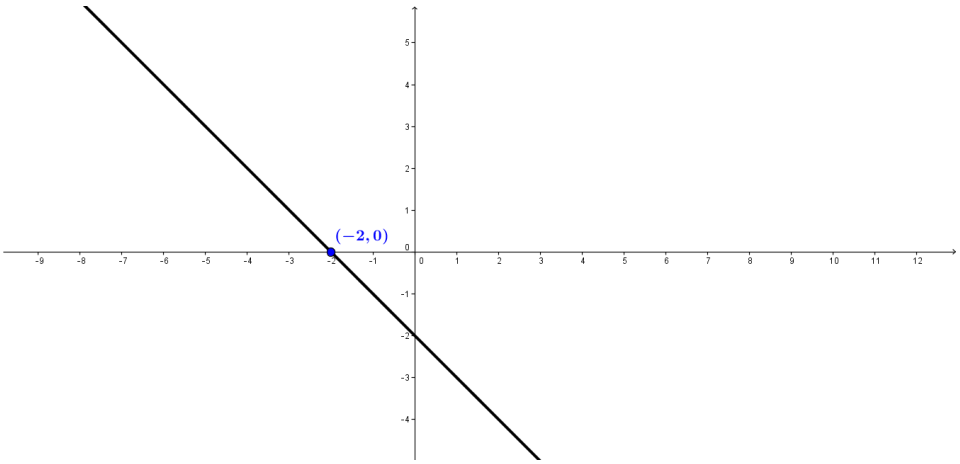
_____
_____
_____
_____

3) Analyse the sign of the following linear functions:

- $f(x) = 3x + 1$



- $f(x) = -x - 2$



Activity 9: Linear inequalities

Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____

Summary:

In the previous lessons, we have learned the meaning of **"studying the sign of a linear function $f(x) = mx + q$"**:

Studying the sign of a linear function means to identify for which values of x the function acquires positive values $(f(x) > 0)$*, for which values of x it acquires negative values* $(f(x) < 0)$ *and lastly for which values of x it acquires a null value* $(f(x) = 0)$.

Generally, once we have found (if it exists) the point of intersection between the line and the x-axis, it will be possible to study the sign of the linear function by following these passages:

- Studying the cases of $f(x) > 0$, $f(x) < 0$ and $(f(x) = 0$ separately, which we already know.
- Finding the intervals of the *x* for which $f(x) > 0$, the intervals of the *x* for which $f(x) < 0$, intervals that strictly depend on the zero x_1 (if it exists) of the function.

Introduction:

We shall now see how to **"solve a linear inequality"**: A linear inequality presents itself like $mx + q > 0$ or $mx + q < 0$.

Linear inequality can be intended as questions. In fact:

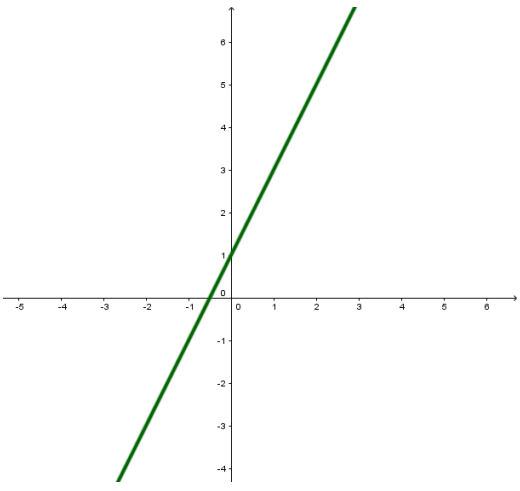
- $mx + q > 0$ is equivalent to asking "for which *x* the expression $mx + q$ proves to be positive?"
- $mx + q < 0$ is equivalent to asking "for which *x* the expression $mx + q$ proves to be negative?"

Therefore, solving a linear inequality means to identify the set of all the *x* that verify the associated inequality.

Activities:

1a) Observe the graph of the linear function $f(x) = 2x + 1$ *and find its zero graphically and algebraically.*

Graphical method:



Algebraic method:

1b) Can you tell, just by observing the graph of the linear function $f(x) = 2x + 1$*, for which values of x is the inequality* $2x + 1 \geq 0$ *satisfied?*

Conclusion:

Solving a linear inequality of the kind $mx + q > 0$ corresponds to studying the sign of function $mx + q = 0$, and then focusing only on $f(x) > 0$. In fact, $f(x) > 0$ means studying $mx + q > 0$.

Problem:

Can we solve a linear inequality also without recurring to the graph of the corresponding function?

The answer is positive: using the algebraic method; given the fact that inequalities are disparities, in order to solve them we may use the properties of the ordering of rational number as follows:

Starting from the inequality: $mx + q > 0$ By subtracting q from both sides of the inequality, we obtain an equivalent inequality: $mx > -q$ Now: • **If $m > 0$** then the preceding one equates to: $x > -\frac{q}{m}$ • **If $m < 0$**, instead, the preceding one equates to: $x < -\frac{q}{m}$	*Example:* $2x + 1 > 0$ By subtracting 2 from both sides of the inequality, we obtain an equivalent inequality: $2x > -1$ Since $2 > 0$, then the preceding one equates to: $x > -\frac{1}{2}$ Had it been $-2x + 1 > 0$, it would have been: $-2x > -1 \Leftrightarrow x < -\frac{1}{-2} \Leftrightarrow x < \frac{1}{2}$

We may have to solve first degree inequalities that do not appear in the form: $mx + q > 0$ In these instances, it is possibile, by solving the sums, to reduce the inequality to the desired form. Let's look at simple example:

$$-3x + 2 > 1 + 4x \Leftrightarrow$$

$$\Leftrightarrow -3x - 4x + 2 - 1 > 0 \Leftrightarrow$$

$$\Leftrightarrow -7x + 1 > 0 \Leftrightarrow \ldots$$

Once we have brought them back to the form: $mx + q > 0$ we can solve the inequality through the algebraic method shown before in the table:

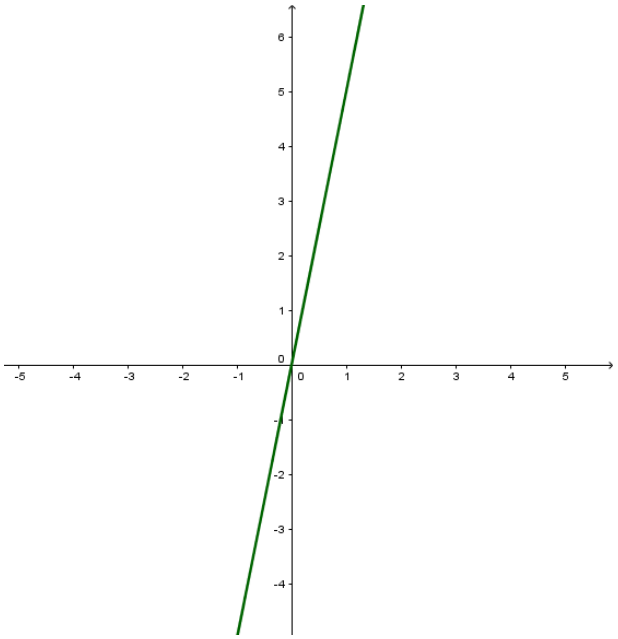
$$\ldots \Leftrightarrow -7x > -1 \Leftrightarrow$$

$$\Leftrightarrow x < \frac{1}{7}$$

2) Solve the following linear inequalities through both the proposed methods:

***NB**: In the previous unit, we have already studied the sign of the linear function connected to the following inequalities!*

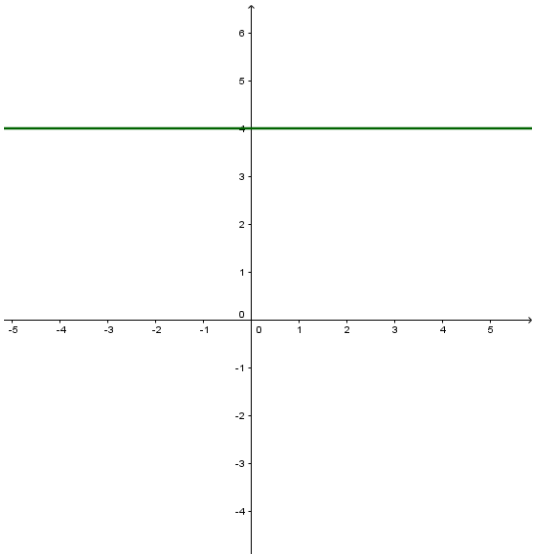
- $5x < 0$



Graphical method:

Algebraic method:

- $x + 4 < x$



Graphical method:

(first of all, bring it back to its explicit form: $mx + q < 0$)

Algebraic method:

Activity 10: 2nd group test

Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____

Rules:

This activity requires each group to draw the graph of 8 linear functions, the study of the sign of 4 linear function and the solution of 8 first degree inequalities.

30 minutes:

Each member will be assigned 2 sheets, each containing: the construction of the graph of two linear functions, the study of the sign of one linear function and the solutions of two first degree inequalities, one with the algebraic method, the other with the graphical method. These exercises will be carried out individually.

20 minutes:

When the time is up, the members will hand all the papers over to the **reader**. The reader will read and discuss with the group the solutions found. If there are any questions, clarifications, revisions, etc., by any member (also by the reader him- or herself), the **mediator** will pause the reading and coordinate the discussion in order to reach a common position.

During the discussions, **EVERYONE** will check the correctness of the exercises carried out by their groupmates, as it is useful to fully understand the subject, as well as in view of the individual final test.

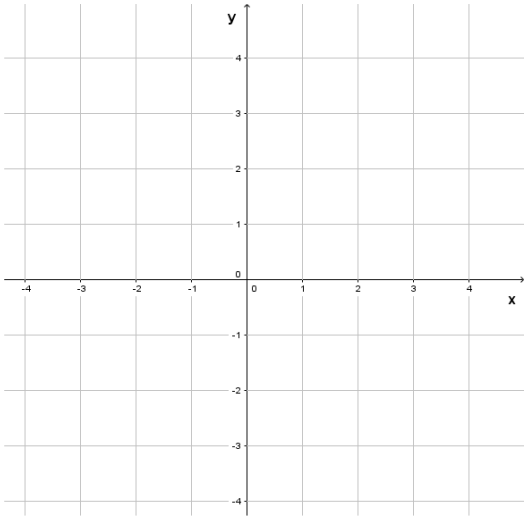
Once a common position is reached, the **writer** only will be tasked with writing down:

1 – the possible corrections and/or additions on each paper sheet in a written form;
2 – the final answer shared by each member of the group in three lines.

Good work!

Reader's sheet (1)

- *Plot the linear function:* $\boldsymbol{f(x) = -3x - 6}$.

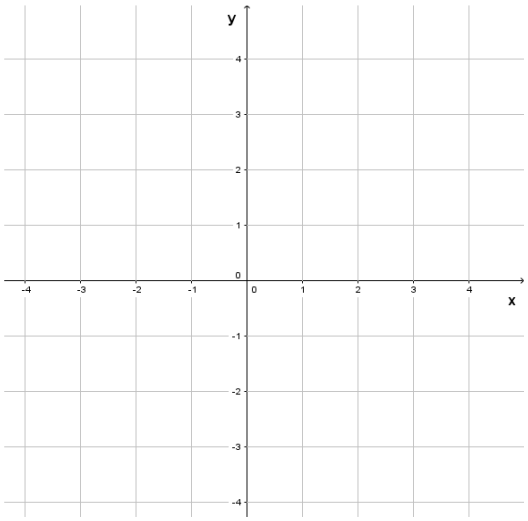


Solve the following first degree inequality: $\boldsymbol{-3x - 6 \leq 0}$ *<u>with the graphical method</u>, that is by inferring the answer by observing the graph you have just drawn <u>only</u>.*

<u>Writer:</u>

Reader's sheet (2)

- *<u>Plot the graph</u> and <u>study the sign</u> of the linear function* $\boldsymbol{f(x) = \frac{3}{2}}$*:*



<u>Writer:</u>

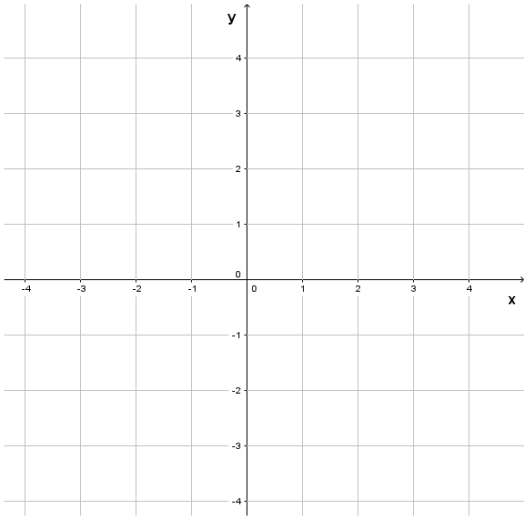
- *Solve the following first degree inequality <u>with the algebraic method</u> and comment the final result:*

$$\boldsymbol{3(x - 1) - 2 < 5x + 1}$$

<u>Writer:</u>

Mediator's sheet (1)

- *Plot the linear function:* $\boldsymbol{f(x) = -2x + 1}$.

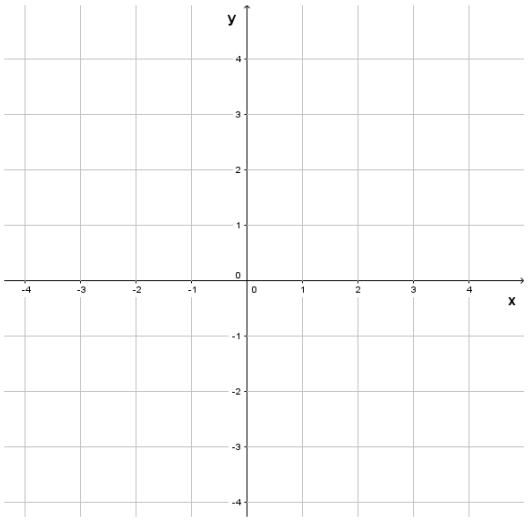


Solve the following first degree inequality: $\boldsymbol{-2x + 1 > 0}$ *<u>with the graphical method</u>, that is by inferring the answer by observing the graph you have just drawn <u>only</u>.*

<u>Writer:</u>

Mediator's sheet (2)

- *<u>Plot the graph</u> and <u>study the sign</u> of the linear function* $\boldsymbol{f(x) = x - 2}$*:*



<u>Writer:</u>

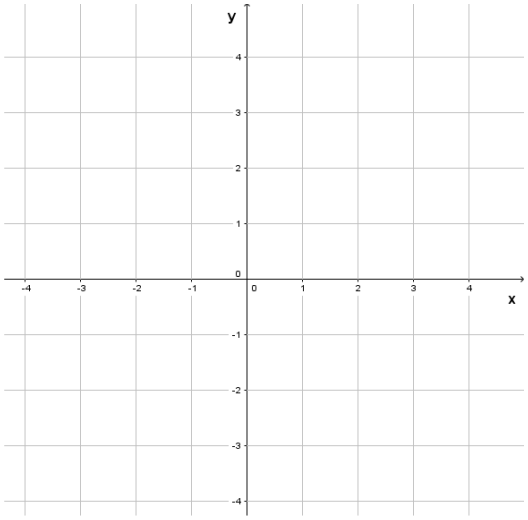
- *Solve the following first degree inequality <u>with the algebraic method</u> and comment the final result:*

$$\boldsymbol{3 + 2(x - 1) > 11 + 5(x - 2)}$$

<u>Writer:</u>

Writer's sheet (1)

- *Plot the linear function:* $\boldsymbol{f(x) = \frac{1}{2}x + \frac{1}{3}}$.

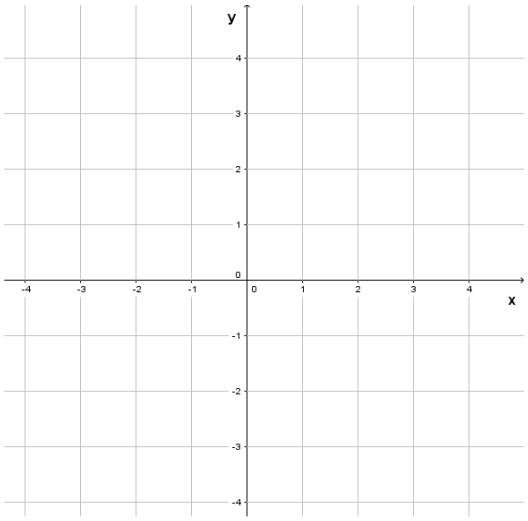


Solve the following first degree inequality: $\boldsymbol{\frac{1}{2}x + \frac{1}{3} < 0}$ *with the graphical method, that is by inferring the answer by observing the graph you have just drawn only.*

Writer:

Writer's sheet (2)

- *Plot the graph and study the sign of the linear function* $\boldsymbol{f(x) = -4x - 2}$*:*



Writer:

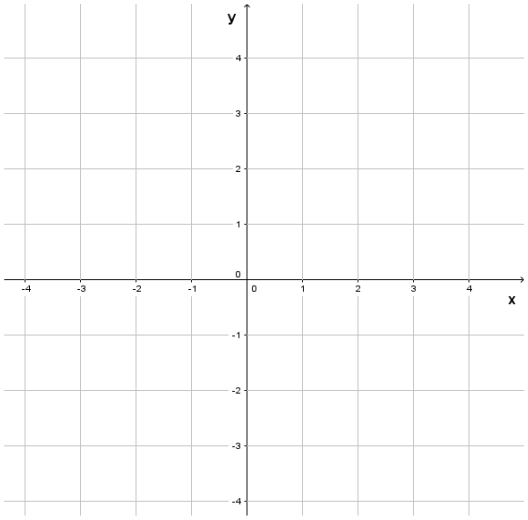
- *Solve the following first degree inequality with the algebraic method and comment the final result:*

$$\boldsymbol{8(5 - x) + 3(x - 5) + 5x > 0}$$

Writer:

Presenter's sheet (1)

- *Plot the linear function:* $\boldsymbol{f(x) = -2x + 3}$.

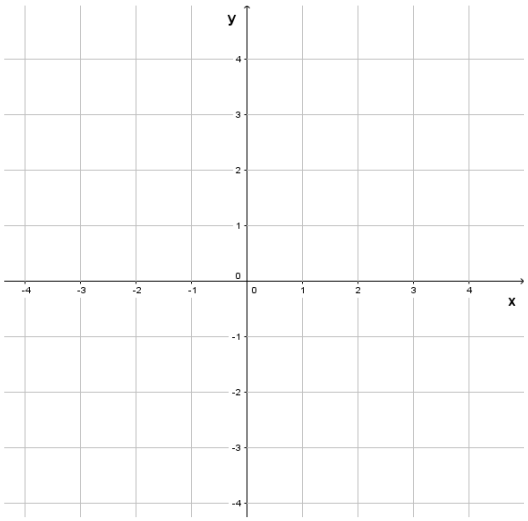


Solve the following first degree inequality: $\boldsymbol{-2x + 3 < 0}$ *<u>with the graphical method</u>, that is by inferring the answer by observing the graph you have just drawn <u>only</u>.*

<u>Writer:</u>

Presenter's sheet (2)

- *<u>Plot the graph</u> and <u>study the sign</u> of the linear function* $\boldsymbol{f(x) = \frac{1}{3}x - 1}$*:*



<u>Writer:</u>

- *Solve the following first degree inequality <u>with the algebraic method</u> and comment the final result:*

$$\boldsymbol{-5x - 3 > 2x + 7(-x + 1)}$$

<u>Writer:</u>

Appendix C.2: Observation protocols of the mutuality parameter

Legend	
i A $_{j,k}$	The student *i* who belongs to the class Aj and to the group *k*.
Obs. 1 / Obs. 2	The two observers who evaluated the mutuality parameter.
Text: Black	Nothing has changed since the first observation – two observers.
Text: Red	The evaluation has changed following the discussion with the other observer.
Background: white	A one unit gap exists between the two oberservers' evaluations (it does not matter whether this happened before or after the discussion).
Background: green	The observers' evaluations coincide (it does not matter whether this happened before or after the discussion).

Appendix C.2.1: Observation protocols of the mutuality parameter - Class A_2

Activity 2 – Ex. 1-2	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer		
Students	1 $A_{2,1}$	1 $A_{2,1}$	average	variance	a_{wg}	2 $A_{2,1}$	2 $A_{2,1}$	average	variance	a_{wg}	3 $A_{2,1}$	3 $A_{2,1}$	average	variance	a_{wg}	4 $A_{2,1}$	4 $A_{2,1}$	average	variance	a_{wg}
item 1	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
item 2	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 10	2,00	3,00	2,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 11	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 12	1,00	1,00	1,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
Average scores	1,42	1,42			0,98	2,67	2,83			0,96	1,58	1,50			0,99	1,33	1,25			0,99
Mutuality	1,42					2,75					1,54					1,29				

Activity 2 – Ex. 3-4-5	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer		
Students	1 $A_{2,1}$	1 $A_{2,1}$	average	variance	a_{wg}	2 $A_{2,1}$	2 $A_{2,1}$	average	variance	a_{wg}	3 $A_{2,1}$	3 $A_{2,1}$	average	variance	a_{wg}	4 $A_{2,1}$	4 $A_{2,1}$	average	variance	a_{wg}
item 1	2,00	2,00	2,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 10	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00
item 11	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 12	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
Average scores	1,17	1,17			1,00	1,67	1,67			0,97	1,58	1,42			0,98	1,25	1,25			1,00
Mutuality	1,17					1,67					1,50					1,25				

Activity 3 – Ex. 1	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	1 $A_{2,1}$	1 $A_{2,1}$	average	variance	a_{wg}	2 $A_{2,1}$	2 $A_{2,1}$	average	variance	a_{wg}	3 $A_{2,1}$	3 $A_{2,1}$	average	variance	a_{wg}	4 $A_{2,1}$	4 $A_{2,1}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 7	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 10	1,00	2,00	1,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 11	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 12	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
Average scores	1,17	1,25			0,98	1,92	1,83			0,99	1,33	1,33			1,00	1,17	1,08			0,98
Mutuality	1,21					1,88					1,33					1,13				

Activity 3 – Ex. 2-3	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	1 $A_{2,1}$	1 $A_{2,1}$	average	variance	a_{wg}	2 $A_{2,1}$	2 $A_{2,1}$	average	variance	a_{wg}	3 $A_{2,1}$	3 $A_{2,1}$	average	variance	a_{wg}	4 $A_{2,1}$	4 $A_{2,1}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 6	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 10	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 11	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
item 12	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
Average scores	1,08	1,08			1,00	1,67	1,58			0,98	1,25	1,25			1,00	1,67	1,50			0,97
Mutuality	1,08					1,63					1,25					1,58				

Activity 3 – Ex. 4-5	Obs. 1	Obs. 2				Obs. 1	Obs. 2				Obs. 1	Obs. 2				Obs. 1	Obs. 2			
Students	1 $A_{2,1}$	1 $A_{2,1}$	average	variance	a_{wg}	2 $A_{2,1}$	2 $A_{2,1}$	average	variance	a_{wg}	3 $A_{2,1}$	3 $A_{2,1}$	average	variance	a_{wg}	4 $A_{2,1}$	4 $A_{2,1}$	average	variance	a_{wg}
item 1																				
item 2																				
item 3																				
item 4																				
item 5																				
item 6																				
item 7																				
item 8																				
item 9																				
item 10																				
item 11																				
item 12																				
Average scores																				
Mutuality																				

1st group test	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2				Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	writer		
Students	1 $A_{2,1}$	1 $A_{2,1}$	average	variance	a_{wg}	2 $A_{2,1}$	2 $A_{2,1}$	average	variance	a_{wg}	3 $A_{2,1}$	3 $A_{2,1}$	average	variance	a_{wg}	4 $A_{2,1}$	4 $A_{2,1}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	2,00	2,00	2,00	0,00	1,00						2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	2,00	1,50	0,50	0,71						2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 6	2,00	2,00	2,00	0,00	1,00						2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	1,00	1,00	1,00	0,00	1,00						2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 10	2,00	2,00	2,00	0,00	1,00						2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 11	2,00	2,00	2,00	0,00	1,00						2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 12	2,00	2,00	2,00	0,00	1,00						2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
Average scores	1,42	1,50			0,98						1,58	1,50			0,98	1,08	1,08			1,00
Mutuality	1,46										1,54					1,08				

Activity 8 – Ex. 1-2	Obs. 1	Obs. 2				Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	writer		
Students	1 $A_{2,1}$	1 $A_{2,1}$	average	variance	a_{wg}	2 $A_{2,1}$	2 $A_{2,1}$	average	variance	a_{wg}	3 $A_{2,1}$	3 $A_{2,1}$	average	variance	a_{wg}	4 $A_{2,1}$	4 $A_{2,1}$	average	variance	a_{wg}
item 1						2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2						2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 3						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6						2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 7						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8						2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9						2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 10						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 11						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 12						2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
Average scores						1,50	1,33			0,95	1,17	1,17			1,00	1,00	1,00			1,00
Mutuality						1,42					1,17					1,00				

2nd group test	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer		
Students	1 $A_{2,1}$	1 $A_{2,1}$	average	variance	a_{wg}	2 $A_{2,1}$	2 $A_{2,1}$	average	variance	a_{wg}	3 $A_{2,1}$	3 $A_{2,1}$	average	variance	a_{wg}	4 $A_{2,1}$	4 $A_{2,1}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	2,00	2,00	2,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00
item 6	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 8	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 10	2,00	2,00	2,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 11	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 12	2,00	3,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
Average scores	1,67	1,75			0,99	1,92	1,92			0,98	1,92	1,83			0,99	1,67	1,75			0,97
Mutuality	1,71					1,92					1,88					1,71				

Activity 2 – Ex. 1-2	Obs. 1	Obs. 2				Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	reader-mediator		
Students	1 $A_{2,2}$	1 $A_{2,2}$	average	variance	a_{wg}	2 $A_{2,2}$	2 $A_{2,2}$	average	variance	a_{wg}	3 $A_{2,2}$	3 $A_{2,2}$	average	variance	a_{wg}	4 $A_{2,2}$	4 $A_{2,2}$	average	variance	a_{wg}
item 1						2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 2						1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87
item 3						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5						2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6						1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 7						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9						2,00	2,00	2,00	0,00	0,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 10						3,00	2,00	2,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71
item 11						1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 12						1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87
Average scores						1,42	1,33			1,00	1,92	2,08			0,98	2,58	2,42			1,04
Mutuality						1,38					2,00					2,50				

Activity 2 – Ex. 3-4-5	Obs. 1	Obs. 2				Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	reader-mediator		
Students	1 $A_{2,2}$	1 $A_{2,2}$	average	variance	a_{wg}	2 $A_{2,2}$	2 $A_{2,2}$	average	variance	a_{wg}	3 $A_{2,2}$	3 $A_{2,2}$	average	variance	a_{wg}	4 $A_{2,2}$	4 $A_{2,2}$	average	variance	a_{wg}
item 1						2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 2						1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 3						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 4						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6						1,00	1,00	1,00	0,00	1,00	3,00	3,00	2,68	0,00	1,00	3,00	4,00	3,50	0,50	0,87
item 7						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9						2,00	2,00	2,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87
item 10						2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 11						1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 12						2,00	2,00	2,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87
Average scores						1,33	1,33			1,00	1,83	1,83			0,98	2,00	2,17			0,96
Mutuality						1,33					1,83					2,09				

Activity 3 – Ex. 1	Obs. 1	Obs. 2				Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	writer		
Students	1 $A_{2,2}$	1 $A_{2,2}$	average	variance	a_{wg}	2 $A_{2,2}$	2 $A_{2,2}$	average	variance	a_{wg}	3 $A_{2,2}$	3 $A_{2,2}$	average	variance	a_{wg}	4 $A_{2,2}$	4 $A_{2,2}$	average	variance	a_{wg}
item 1						1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 2						1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 3						1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4						1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 5						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 6						2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 7						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 8						1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 9						1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 10						2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 11						1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87
item 12						2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
Average scores						1,25	1,25			1,00	2,17	2,08			0,95	2,25	2,33			0,97
Mutuality						1,25					2,13					2,29				

Activity 3 – Ex. 2-3	Obs. 1	Obs. 2				Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	writer		
Students	1 $A_{2,2}$	1 $A_{2,2}$	average	variance	a_{wg}	2 $A_{2,2}$	2 $A_{2,2}$	average	variance	a_{wg}	3 $A_{2,2}$	3 $A_{2,2}$	average	variance	a_{wg}	4 $A_{2,2}$	4 $A_{2,2}$	average	variance	a_{wg}
item 1						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 2						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 3						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 6						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 7						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 10						1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 11						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 12						1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
Average scores						1,00	1,00			1,00	1,17	1,17			1,00	1,50	1,50			1,00
Mutuality						1,00					1,17					1,50				

Activity 3 – Ex. 4-5	Obs. 1	Obs. 2				Obs. 1	Obs. 2				Obs. 1	Obs. 2				Obs. 1	Obs. 2			
Students	1 $A_{2,2}$	1 $A_{2,2}$	average	variance	a_{wg}	2 $A_{2,2}$	2 $A_{2,2}$	average	variance	a_{wg}	3 $A_{2,2}$	3 $A_{2,2}$	average	variance	a_{wg}	4 $A_{2,2}$	4 $A_{2,2}$	average	variance	a_{wg}
item 1																				
item 2																				
item 3																				
item 4																				
item 5																				
item 6																				
item 7																				
item 8																				
item 9																				
item 10																				
item 11																				
item 12																				
Average scores																				
Mutuality																				

1st group test	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	presenter		
Students	1 $A_{2,2}$	1 $A_{2,2}$	average	variance	a_{wg}	2 $A_{2,2}$	2 $A_{2,2}$	average	variance	a_{wg}	3 $A_{2,2}$	3 $A_{2,2}$	average	variance	a_{wg}	4 $A_{2,2}$	4 $A_{2,2}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 3	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
item 10	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 11	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 12	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	3,00	3,00	3,00	0,00	1,00
Average scores	1,25	1,33			0,98	1,08	1,08			1,00	1,58	1,75			0,97	2,00	2,08			0,97
Mutuality	1,29					1,08					1,67					2,04				

Activity 8 – Ex. 1-2	Obs. 1	Obs. 2				Obs. 1	Obs. 2				Obs. 1	Obs. 2				Obs. 1	Obs. 2			
Students	1 $A_{2,2}$	1 $A_{2,2}$	average	variance	a_{wg}	2 $A_{2,2}$	2 $A_{2,2}$	average	variance	a_{wg}	3 $A_{2,2}$	3 $A_{2,2}$	average	variance	a_{wg}	4 $A_{2,2}$	4 $A_{2,2}$	average	variance	a_{wg}
item 1																				
item 2																				
item 3																				
item 4																				
item 5																				
item 6																				
item 7																				
item 8																				
item 9																				
item 10																				
item 11																				
item 12																				
Average scores																				
Mutuality																				

2nd group test	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	presenter		
Students	1 $A_{2,2}$	1 $A_{2,2}$	average	variance	a_{wg}	2 $A_{2,2}$	2 $A_{2,2}$	average	variance	a_{wg}	3 $A_{2,2}$	3 $A_{2,2}$	average	variance	a_{wg}	4 $A_{2,2}$	4 $A_{2,2}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 8	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 9	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
item 10	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 11	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87
item 12	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
Average scores	1,42	1,50			0,99	1,08	1,08			1,00	1,92	1,83			0,99	2,50	2,42			0,97
Mutuality	1,46					1,08					1,88					2,46				

Activity 2 – Ex. 1-2	Obs. 1	Obs. 2	reader-presenter			Obs. 1	Obs. 2	mediator-writer			Obs. 1	Obs. 2				Obs. 1	Obs. 2			
Students	1 $A_{2,3}$	1 $A_{2,3}$	average	variance	a_{wg}	2 $A_{2,3}$	2 $A_{2,3}$	average	variance	a_{wg}	3 $A_{2,3}$	3 $A_{2,3}$	average	variance	a_{wg}	4 $A_{2,3}$	4 $A_{2,3}$	average	variance	a_{wg}
item 1	2,00	2,00	2,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87										
item 2	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 3	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00										
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 6	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 9	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00										
item 10	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00										
item 11	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00										
item 12	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
Average scores	1,83	1,83			0,98	1,33	1,25			0,99										
Mutuality	1,83					1,29														

Activity 2 – Ex. 3-4-5	Obs. 1	Obs. 2	reader-presenter			Obs. 1	Obs. 2	mediator-writer			Obs. 1	Obs. 2				Obs. 1	Obs. 2			
Students	1 $A_{2,3}$	1 $A_{2,3}$	average	variance	a_{wg}	2 $A_{2,3}$	2 $A_{2,3}$	average	variance	a_{wg}	3 $A_{2,3}$	3 $A_{2,3}$	average	variance	a_{wg}	4 $A_{2,3}$	4 $A_{2,3}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 2	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 6	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 9	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 10	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 11	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 12	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
Average scores	1,00	1,00			1,00	1,00	1,00			1,00										
Mutuality	1,00					1,00														

Activity 3 – Ex. 1	Obs. 1	Obs. 2	mediator-writer			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2			
Students	1 $A_{2,3}$	1 $A_{2,3}$	average	variance	a_{wg}	2 $A_{2,3}$	2 $A_{2,3}$	average	variance	a_{wg}	3 $A_{2,3}$	3 $A_{2,3}$	average	variance	a_{wg}	4 $A_{2,3}$	4 $A_{2,3}$	average	variance	a_{wg}
item 1	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 2	3,00	3,00	3,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00					
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 5	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 6	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 7	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 8	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 9	3,00	3,00	3,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00					
item 10	3,00	4,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 11	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 12	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
Average scores	2,33	2,42			0,99	1,42	1,58			0,97	1,17	1,17			1,00					
Mutuality	2,38					1,50					1,17									

Activity 3 – Ex. 2-3	Obs. 1	Obs. 2	mediator-writer			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2			
Students	1 $A_{2,3}$	1 $A_{2,3}$	average	variance	a_{wg}	2 $A_{2,3}$	2 $A_{2,3}$	average	variance	a_{wg}	3 $A_{2,3}$	3 $A_{2,3}$	average	variance	a_{wg}	4 $A_{2,3}$	4 $A_{2,3}$	average	variance	a_{wg}
item 1	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 2	2,00	1,00	1,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 5	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 6	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 9	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 10	4,00	3,00	3,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00					
item 11	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 12	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
Average scores	2,08	1,83			0,94	1,50	1,42			0,99	1,08	1,08			1,00					
Mutuality	1,96					1,46					1,08									

Activity 3 – Ex. 4-5	Obs. 1	Obs. 2				Obs. 1	Obs. 2				Obs. 1	Obs. 2				Obs. 1	Obs. 2			
Students	1 $A_{2,3}$	1 $A_{2,3}$	average	variance	a_{wg}	2 $A_{2,3}$	2 $A_{2,3}$	average	variance	a_{wg}	3 $A_{2,3}$	3 $A_{2,3}$	average	variance	a_{wg}	4 $A_{2,3}$	4 $A_{2,3}$	average	variance	a_{wg}
item 1																				
item 2																				
item 3																				
item 4																				
item 5																				
item 6																				
item 7																				
item 8																				
item 9																				
item 10																				
item 11																				
item 12																				
Average scores																				
Mutuality																				

1st group test	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	mediator		
Students	1 $A_{2,3}$	1 $A_{2,3}$	average	variance	a_{wg}	2 $A_{2,3}$	2 $A_{2,3}$	average	variance	a_{wg}	3 $A_{2,3}$	3 $A_{2,3}$	average	variance	a_{wg}	4 $A_{2,3}$	4 $A_{2,3}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 3	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	3,00	3,00	3,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 6	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 8	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
item 9	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 10	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 11	3,00	4,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
item 12	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
Average scores	2,42	2,50			0,99	2,08	2,00			0,98	1,17	1,17			1,00	1,67	1,42			0,93
Mutuality	2,46					2,04					1,17					1,54				

Activity 8 – Ex. 1-2	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	writer-presenter			Obs. 1	Obs. 2				Obs. 1	Obs. 2	mediator		
Students	1 $A_{2,3}$	1 $A_{2,3}$	average	variance	a_{wg}	2 $A_{2,3}$	2 $A_{2,3}$	average	variance	a_{wg}	3 $A_{2,3}$	3 $A_{2,3}$	average	variance	a_{wg}	4 $A_{2,3}$	4 $A_{2,3}$	average	variance	a_{wg}
item 1	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 2	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 5	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 6	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 9	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 10	3,00	2,00	2,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87						1,00	1,00	1,00	0,00	1,00
item 11	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 12	2,00	3,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
Average scores	1,75	1,83			0,95	1,42	1,33			0,99						1,00	1,00			1,00
Mutuality	1,79					1,38										1,00				

2nd group test	Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	writer		
Students	1 $A_{2,3}$	1 $A_{2,3}$	average	variance	a_{wg}	2 $A_{2,3}$	2 $A_{2,3}$	average	variance	a_{wg}	3 $A_{2,3}$	3 $A_{2,3}$	average	variance	a_{wg}	4 $A_{2,3}$	4 $A_{2,3}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	3,00	3,00	3,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 6	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 8	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 10	3,00	4,00	3,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 11	4,00	3,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
item 12	4,00	3,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
Average scores	2,50	2,33			0,96	1,75	1,58			0,98	1,17	1,17			1,00	1,50	1,67			0,93
Mutuality	2,42					1,67					1,17					1,58				

Activity 2 – Ex. 1-2	Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	writer-presenter			Obs. 1	Obs. 2				Obs. 1	Obs. 2			
Students	1 $A_{2,4}$	1 $A_{2,4}$	average	variance	a_{wg}	2 $A_{2,4}$	2 $A_{2,4}$	average	variance	a_{wg}	3 $A_{2,4}$	3 $A_{2,4}$	average	variance	a_{wg}	4 $A_{2,4}$	4 $A_{2,4}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 2	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 4	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 5	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00										
item 6	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 9	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00										
item 10	3,00	3,00	3,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87										
item 11	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 12	2,00	3,00	2,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87										
Average scores	1,83	1,92			0,99	1,50	1,33			0,98										
Mutuality	1,88					1,42														

Activity 2 – Ex. 3-4-5	Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	writer-presenter			Obs. 1	Obs. 2				Obs. 1	Obs. 2			
Students	1 $A_{2,4}$	1 $A_{2,4}$	average	variance	a_{wg}	2 $A_{2,4}$	2 $A_{2,4}$	average	variance	a_{wg}	3 $A_{2,4}$	3 $A_{2,4}$	average	variance	a_{wg}	4 $A_{2,4}$	4 $A_{2,4}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 2	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 6	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 9	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 10	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 11	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 12	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00										
Average scores	1,33	1,33			1,00	1,08	1,08			1,00										
Mutuality	1,33					1,08														

Activity 3 – Ex. 1	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	reader		
Students	1 $A_{2,4}$	1 $A_{2,4}$	average	variance	a_{wg}	2 $A_{2,4}$	2 $A_{2,4}$	average	variance	a_{wg}	3 $A_{2,4}$	3 $A_{2,4}$	average	variance	a_{wg}	4 $A_{2,4}$	4 $A_{2,4}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 10	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 11	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 12	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
Average scores	1,25	1,25			1,00	1,08	1,08			1,00	1,00	1,00			1,00	1,00	1,00			1,00
Mutuality	1,25					1,08					1,00					1,00				

Activity 3 – Ex. 2-3	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	reader		
Students	1 $A_{2,4}$	1 $A_{2,4}$	average	variance	a_{wg}	2 $A_{2,4}$	2 $A_{2,4}$	average	variance	a_{wg}	3 $A_{2,4}$	3 $A_{2,4}$	average	variance	a_{wg}	4 $A_{2,4}$	4 $A_{2,4}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 10	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 11	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 12	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
Average scores	1,00	1,00			1,00	1,08	1,17			0,98	1,00	1,00			1,00	1,00	1,00			1,00
Mutuality	1,00					1,13					1,00					1,00				

Activity 3 – Ex. 4-5	Obs. 1	Obs. 2				Obs. 1	Obs. 2				Obs. 1	Obs. 2				Obs. 1	Obs. 2			
Students	1 $A_{2,4}$	1 $A_{2,4}$	average	variance	a_{wg}	2 $A_{2,4}$	2 $A_{2,4}$	average	variance	a_{wg}	3 $A_{2,4}$	3 $A_{2,4}$	average	variance	a_{wg}	4 $A_{2,4}$	4 $A_{2,4}$	average	variance	a_{wg}
item 1																				
item 2																				
item 3																				
item 4																				
item 5																				
item 6																				
item 7																				
item 8																				
item 9																				
item 10																				
item 11																				
item 12																				
Average scores																				
Mutuality																				

1st group test	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2			
Students	1 $A_{2,4}$	1 $A_{2,4}$	average	variance	a_{wg}	2 $A_{2,4}$	2 $A_{2,4}$	average	variance	a_{wg}	3 $A_{2,4}$	3 $A_{2,4}$	average	variance	a_{wg}	4 $A_{2,4}$	4 $A_{2,4}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 2	2,00	2,00	2,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00					
item 3	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 6	2,00	1,00	1,50	0,50	0,71	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00					
item 7	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 8	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 9	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 10	3,00	3,00	3,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00					
item 11	2,00	3,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 12	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71					
Average scores	1,83	1,83			0,97	1,92	1,83			0,94	1,42	1,33			0,98					
Mutuality	1,83					1,88					1,38									

Activity 8 – Ex. 1-2	Obs. 1	Obs. 2	reader-presenter			Obs. 1	Obs. 2	mediator-writer			Obs. 1	Obs. 2				Obs. 1	Obs. 2			
Students	1 $A_{2,4}$	1 $A_{2,4}$	average	variance	a_{wg}	2 $A_{2,4}$	2 $A_{2,4}$	average	variance	a_{wg}	3 $A_{2,4}$	3 $A_{2,4}$	average	variance	a_{wg}	4 $A_{2,4}$	4 $A_{2,4}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 2	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 5	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00										
item 6	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 9	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00										
item 10	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00										
item 11	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00										
item 12	3,00	3,00	3,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87										
Average scores	1,25	1,25			1,00	1,42	1,33			0,99										
Mutuality	1,25					1,38														

2nd group test	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	mediator		
Students	1 $A_{2,4}$	1 $A_{2,4}$	average	variance	a_{wg}	2 $A_{2,4}$	2 $A_{2,4}$	average	variance	a_{wg}	3 $A_{2,4}$	3 $A_{2,4}$	average	variance	a_{wg}	4 $A_{2,4}$	4 $A_{2,4}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 3	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 7	3,00	4,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 9	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 10	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00
item 11	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 12	3,00	2,00	2,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
Average scores	1,83	1,83			0,98	1,67	1,75			0,99	1,17	1,08			0,98	1,25	1,25			1,00
Mutuality	1,83					1,71					1,13					1,25				

Activity 2 – Ex. 1-2	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2				Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	presenter		
Students	1 $A_{2,5}$	1 $A_{2,5}$	average	variance	a_{wg}	2 $A_{2,5}$	2 $A_{2,5}$	average	variance	a_{wg}	3 $A_{2,5}$	3 $A_{2,5}$	average	variance	a_{wg}	4 $A_{2,5}$	4 $A_{2,5}$	average	variance	a_{wg}
item 1	3,00	2,00	2,50	0,50	0,87						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	3,00	3,00	3,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 3	1,00	2,00	1,50	0,50	0,71						1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 4	2,00	2,00	2,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	3,00	2,00	2,50	0,50	0,87						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	2,00	2,00	2,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
item 9	3,00	4,00	3,50	0,50	0,87						3,00	2,00	2,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00
item 10	3,00	3,00	3,00	0,00	1,00						3,00	2,00	2,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87
item 11	2,00	2,00	2,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
item 12	3,00	3,00	3,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
Average scores	2,25	2,25			0,94						1,33	1,17			0,98	1,92	1,58			0,92
Mutuality	2,25										1,25					1,75				

Activity 2 – Ex. 3-4-5	Obs. 1	Obs. 2				Obs. 1	Obs. 2				Obs. 1	Obs. 2				Obs. 1	Obs. 2			
Students	1 $A_{2,5}$	1 $A_{2,5}$	average	variance	a_{wg}	2 $A_{2,5}$	2 $A_{2,5}$	average	variance	a_{wg}	3 $A_{2,5}$	3 $A_{2,5}$	average	variance	a_{wg}	4 $A_{2,5}$	4 $A_{2,5}$	average	variance	a_{wg}
item 1																				
item 2																				
item 3																				
item 4																				
item 5																				
item 6																				
item 7																				
item 8																				
item 9																				
item 10																				
item 11																				
item 12																				
Average scores																				
Mutuality																				

Activity 3 – Ex. 1	Obs. 1	Obs. 2				Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader-mediator		
Students	1 $A_{2,5}$	1 $A_{2,5}$	average	variance	a_{wg}	2 $A_{2,5}$	2 $A_{2,5}$	average	variance	a_{wg}	3 $A_{2,5}$	3 $A_{2,5}$	average	variance	a_{wg}	4 $A_{2,5}$	4 $A_{2,5}$	average	variance	a_{wg}
item 1						1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2						1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
item 3						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 6						1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 7						1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8						1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 9						1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 10						1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
item 11						1,00	1,00	1,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 12						1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
Average scores						1,00	1,00			1,00	2,67	2,67			0,98	1,83	1,75			0,95
Mutuality						1,00					2,67					1,79				

Activity 3 – Ex. 2-3	Obs. 1	Obs. 2				Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader-mediator		
Students	1 $A_{2,5}$	1 $A_{2,5}$	average	variance	a_{wg}	2 $A_{2,5}$	2 $A_{2,5}$	average	variance	a_{wg}	3 $A_{2,5}$	3 $A_{2,5}$	average	variance	a_{wg}	4 $A_{2,5}$	4 $A_{2,5}$	average	variance	a_{wg}
item 1						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 3						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5						1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 6						1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
item 7						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9						1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 10						1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 11						1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00
item 12						1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
Average scores						1,00	1,00			1,00	1,50	1,50			0,97	1,33	1,33			0,95
Mutuality						1,00					1,50					1,33				

Activity 3 – Ex. 4-5	Obs. 1	Obs. 2				Obs. 1	Obs. 2				Obs. 1	Obs. 2				Obs. 1	Obs. 2			
Students	1 $A_{2,5}$	1 $A_{2,5}$	average	variance	a_{wg}	2 $A_{2,5}$	2 $A_{2,5}$	average	variance	a_{wg}	3 $A_{2,5}$	3 $A_{2,5}$	average	variance	a_{wg}	4 $A_{2,5}$	4 $A_{2,5}$	average	variance	a_{wg}
item 1																				
item 2																				
item 3																				
item 4																				
item 5																				
item 6																				
item 7																				
item 8																				
item 9																				
item 10																				
item 11																				
item 12																				
Average scores																				
Mutuality																				

1st group test	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	mediator		
Students	1 $A_{2,5}$	1 $A_{2,5}$	average	variance	a_{wg}	2 $A_{2,5}$	2 $A_{2,5}$	average	variance	a_{wg}	3 $A_{2,5}$	3 $A_{2,5}$	average	variance	a_{wg}	4 $A_{2,5}$	4 $A_{2,5}$	average	variance	a_{wg}
item 1	3,00	3,00	3,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87
item 2	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 7	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 8	2,00	3,00	2,50	0,50	0,87	4,00	5,00	4,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87
item 9	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00
item 10	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
item 11	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 12	2,00	3,00	2,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00
Average scores	1,92	2,08			0,98	2,67	2,75			0,95	2,92	2,92			0,97	2,08	2,17			0,97
Mutuality	2,00					2,71					2,92					2,13				

Activity 8 – Ex. 1-2	Obs. 1	Obs. 2				Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2				Obs. 1	Obs. 2	writer-presenter		
Students	1 $A_{2,5}$	1 $A_{2,5}$	average	variance	a_{wg}	2 $A_{2,5}$	2 $A_{2,5}$	average	variance	a_{wg}	3 $A_{2,5}$	3 $A_{2,5}$	average	variance	a_{wg}	4 $A_{2,5}$	4 $A_{2,5}$	average	variance	a_{wg}
item 1						3,00	3,00	3,00	0,00	1,00						2,00	2,00	2,00	0,00	1,00
item 2						1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 3						1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 4						1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 5						1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 6						2,00	2,00	2,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 7						1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 8						1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 9						3,00	4,00	3,50	0,50	0,87						1,00	1,00	1,00	0,00	1,00
item 10						2,00	2,00	2,00	0,00	1,00						2,00	2,00	2,00	0,00	1,00
item 11						1,00	1,00	1,00	0,00	1,00						2,00	2,00	2,00	0,00	1,00
item 12						1,00	1,00	1,00	0,00	1,00						2,00	2,00	2,00	0,00	1,00
Average scores						1,50	1,58			0,99						1,33	1,33			1,00
Mutuality						1,54										1,33				

2nd group test	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2			
Students	1 $A_{2,5}$	1 $A_{2,5}$	average	variance	a_{wg}	2 $A_{2,5}$	2 $A_{2,5}$	average	variance	a_{wg}	3 $A_{2,5}$	3 $A_{2,5}$	average	variance	a_{wg}	4 $A_{2,5}$	4 $A_{2,5}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 2	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87					
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 6	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 8	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00					
item 9	2,00	2,00	2,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87					
item 10	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00					
item 11	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87					
item 12	3,00	2,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00					
Average scores	1,67	1,58			0,99	1,83	1,92			0,99	2,08	2,00			0,97					
Mutuality	1,63					1,88					2,04									

Appendix C.2.2: Observation protocols of the mutuality parameter - Class B_1

Activity 2 – Ex. 1-2	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	presenter		
Students	1 $B_{1,2}$	1 $B_{1,2}$	average	variance	a_{wg}	2 $B_{1,2}$	2 $B_{1,2}$	average	variance	a_{wg}	3 $B_{1,2}$	3 $B_{1,2}$	average	variance	a_{wg}	4 $B_{1,2}$	4 $B_{1,2}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
item 3	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 9	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87
item 10	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 11	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
item 12	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
Average scores	1,00	1,00			1,00	1,67	1,67			1,00	2,25	2,33			0,97	2,00	1,92			0,97
Mutuality	1,00					1,67					2,29					1,96				

Activity 2 – Ex. 3-4-5	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	presenter		
Students	1 $B_{1,2}$	1 $B_{1,2}$	average	variance	a_{wg}	2 $B_{1,2}$	2 $B_{1,2}$	average	variance	a_{wg}	3 $B_{1,2}$	3 $B_{1,2}$	average	variance	a_{wg}	4 $B_{1,2}$	4 $B_{1,2}$	average	variance	a_{wg}
item 1	2,00	2,00	2,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 3	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 10	1,00	2,00	1,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 11	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 12	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
Average scores	1,17	1,25			0,98	1,50	1,50			0,97	1,08	1,08			1,00	1,75	1,92			0,98
Mutuality	1,21					1,50					1,08					1,83				

Activity 3 – Ex. 1	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	mediator		
Students	1 $B_{1,2}$	1 $B_{1,2}$	average	variance	a_{wg}	2 $B_{1,2}$	2 $B_{1,2}$	average	variance	a_{wg}	3 $B_{1,2}$	3 $B_{1,2}$	average	variance	a_{wg}	4 $B_{1,2}$	4 $B_{1,2}$	average	variance	a_{wg}
item 1	3,00	4,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 2	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71
item 10	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 11	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 12	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
Average scores	2,17	2,25			0,97	1,00	1,00			1,00	2,67	2,50			0,98	2,58	2,42			0,97
Mutuality	2,21					1,00					2,58					2,50				

Activity 3 – Ex. 2-3	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	mediator		
Students	1 $B_{1,2}$	1 $B_{1,2}$	average	variance	a_{wg}	2 $B_{1,2}$	2 $B_{1,2}$	average	variance	a_{wg}	3 $B_{1,2}$	3 $B_{1,2}$	average	variance	a_{wg}	4 $B_{1,2}$	4 $B_{1,2}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71	4,00	3,00	3,50	0,50	0,87
item 10	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 11	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 12	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
Average scores	1,08	1,08			1,00	1,08	1,17			0,98	2,58	2,33			0,95	2,08	2,00			0,99
Mutuality	1,08					1,13					2,46					2,04				

Activity 3 – Ex. 4-5	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	mediator		
Students	1 $B_{1,2}$	1 $B_{1,2}$	average	variance	a_{wg}	2 $B_{1,2}$	2 $B_{1,2}$	average	variance	a_{wg}	3 $B_{1,2}$	3 $B_{1,2}$	average	variance	a_{wg}	4 $B_{1,2}$	4 $B_{1,2}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
item 2	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 9	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
item 10	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 11	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 12	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
Average scores	1,00	1,00			1,00	1,00	1,00			1,00	2,17	2,25			0,99	2,50	2,50			0,96
Mutuality	1,00					1,00					2,21					2,50				

1st group test	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	mediator		
Students	1 $B_{1,2}$	1 $B_{1,2}$	average	variance	a_{wg}	2 $B_{1,2}$	2 $B_{1,2}$	average	variance	a_{wg}	3 $B_{1,2}$	3 $B_{1,2}$	average	variance	a_{wg}	4 $B_{1,2}$	4 $B_{1,2}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 7	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 9	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00
item 10	1,00	2,00	1,50	0,50	0,71	2,00	1,00	1,50	0,50	0,71	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 11	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87
item 12	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
Average scores	1,17	1,17			0,95	1,08	1,00			0,98	2,75	2,67			0,97	2,50	2,50			0,98
Mutuality	1,17					1,04					2,71					2,50				

Activity 8 – Ex. 1-2	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	reader		
Students	1 $B_{1,2}$	1 $B_{1,2}$	average	variance	a_{wg}	2 $B_{1,2}$	2 $B_{1,2}$	average	variance	a_{wg}	3 $B_{1,2}$	3 $B_{1,2}$	average	variance	a_{wg}	4 $B_{1,2}$	4 $B_{1,2}$	average	variance	a_{wg}
item 1	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 2	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87
item 3	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 5	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 6	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 9	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 10	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 11	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 12	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
Average scores	1,92	1,92			0,97	1,00	1,00			1,00	1,58	1,67			0,99	2,50	2,42			0,95
Mutuality	1,92					1,00					1,63					2,46				

2nd group test	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer		
Students	1 $B_{1,2}$	1 $B_{1,2}$	average	variance	a_{wg}	2 $B_{1,2}$	2 $B_{1,2}$	average	variance	a_{wg}	3 $B_{1,2}$	3 $B_{1,2}$	average	variance	a_{wg}	4 $B_{1,2}$	4 $B_{1,2}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 6	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87
item 7	3,00	3,00	3,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	5,00	4,00	4,50	0,50	0,71
item 9	2,00	3,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71	4,00	4,00	4,00	0,00	1,00
item 10	3,00	2,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 11	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87
item 12	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87
Average scores	1,92	1,83			0,95	1,33	1,25			0,98	2,83	2,83			0,92	2,92	2,75			0,94
Mutuality	1,88					1,29					2,83					2,83				

Activity 2 – Ex. 1-2	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2			
Students	1 $B_{1,3}$	1 $B_{1,3}$	average	variance	a_{wg}	2 $B_{1,3}$	2 $B_{1,3}$	media	average	variance	3 $B_{1,3}$	3 $B_{1,3}$	average	variance	a_{wg}	4 $B_{1,3}$	4 $B_{1,3}$	average	variance	a_{wg}
item 1	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87					
item 2	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 4	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 6	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 8	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 9	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00					
item 10	5,00	5,00	5,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00					
item 11	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 12	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00					
Average scores	2,92	2,83			0,99	1,83	1,75			0,99	1,83	1,92			0,99					
Mutuality	2,88					1,79					1,88									

Activity 2 – Ex. 3-4-5	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2			
Students	1 $B_{1,3}$	1 $B_{1,3}$	average	variance	a_{wg}	2 $B_{1,3}$	2 $B_{1,3}$	media	average	variance	3 $B_{1,3}$	3 $B_{1,3}$	average	variance	a_{wg}	4 $B_{1,3}$	4 $B_{1,3}$	average	variance	a_{wg}
item 1	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00					
item 2	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 5	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 6	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 9	3,00	4,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 10	5,00	5,00	5,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71	2,00	1,00	1,50	0,50	0,71					
item 11	4,00	3,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 12	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
Average scores	2,67	2,67			0,98	2,08	2,00			0,98	1,33	1,25			0,98					
Mutuality	2,67					2,04					1,29									

Activity 3 – Ex. 1	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	reader-writer			Obs. 1	Obs. 2			
Students	1 $B_{1,3}$	1 $B_{1,3}$	average	variance	a_{wg}	2 $B_{1,3}$	2 $B_{1,3}$	media	average	variance	3 $B_{1,3}$	3 $B_{1,3}$	average	variance	a_{wg}	4 $B_{1,3}$	4 $B_{1,3}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87					
item 2	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 6	4,00	3,00	3,50	0,50	1,00	2,00	2,00	2,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71					
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 8	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 9	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 10	3,00	3,00	3,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00					
item 11	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 12	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00					
Average scores	2,17	2,08			1,00	1,58	1,50			0,99	1,75	1,75			0,97					
Mutuality	2,13					1,54					1,75									

Activity 3 – Ex. 2-3	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	reader-writer			Obs. 1	Obs. 2			
Students	1 $B_{1,3}$	1 $B_{1,3}$	average	variance	a_{wg}	2 $B_{1,3}$	2 $B_{1,3}$	media	average	variance	3 $B_{1,3}$	3 $B_{1,3}$	average	variance	a_{wg}	4 $B_{1,3}$	4 $B_{1,3}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00					
item 2	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87					
item 6	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 9	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 10	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00					
item 11	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00					
item 12	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00					
Average scores	2,33	2,17			0,98	1,00	1,00			1,00	2,33	2,25			0,99					
Mutuality	2,25					1,00					2,29									

Activity 3 – Ex. 4-5	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader		
Students	1 $B_{1,3}$	1 $B_{1,3}$	average	variance	a_{wg}	2 $B_{1,3}$	2 $B_{1,3}$	media	average	variance	3 $B_{1,3}$	3 $B_{1,3}$	average	variance	a_{wg}	4 $B_{1,3}$	4 $B_{1,3}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 2	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 6	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
item 10	3,00	3,00	3,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 11	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
item 12	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
Average scores	1,92	2,00			0,99	1,33	1,25			0,99	1,17	1,17			1,00	1,92	1,67			0,95
Mutuality	1,96					1,29					1,17					1,79				

1st group test	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	mediator		
Students	1 $B_{1,3}$	1 $B_{1,3}$	average	variance	a_{wg}	2 $B_{1,3}$	2 $B_{1,3}$	media	average	variance	3 $B_{1,3}$	3 $B_{1,3}$	average	variance	a_{wg}	4 $B_{1,3}$	4 $B_{1,3}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
item 6	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	2,00	3,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
item 9	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 10	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 11	3,00	3,00	3,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 12	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
Average scores	2,00	2,08			0,99	2,00	1,92			0,99	1,00	1,00			1,00	1,42	1,25			0,95
Mutuality	2,04					1,96					1,00					1,33				

Activity 8 – Ex. 1-2	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	writer		
Students	1 $B_{1,3}$	1 $B_{1,3}$	average	variance	a_{wg}	2 $B_{1,3}$	2 $B_{1,3}$	media	average	variance	3 $B_{1,3}$	3 $B_{1,3}$	average	variance	a_{wg}	4 $B_{1,3}$	4 $B_{1,3}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	4,00	3,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 10	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 11	3,00	3,00	3,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 12	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
Average scores	2,17	2,08			0,99	1,42	1,33			0,99	1,50	1,42			0,98	1,00	1,00			1,00
Mutuality	2,13					1,38					1,46					1,00				

2nd group test	Obs. 1	Obs. 2				Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	presenter		
Students	1 $B_{1,3}$	1 $B_{1,3}$	average	variance	a_{wg}	2 $B_{1,3}$	2 $B_{1,3}$	media	average	variance	3 $B_{1,3}$	3 $B_{1,3}$	average	variance	a_{wg}	4 $B_{1,3}$	4 $B_{1,3}$	average	variance	a_{wg}
item 1						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2						2,00	2,00	2,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87
item 3						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5						1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 6						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 7						1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	4,00	5,00	4,50	0,50	0,71
item 8						2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 9						1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 10						2,00	3,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 11						2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 12						2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
Average scores						1,42	1,50			0,99	1,92	1,75			0,97	2,67	2,83			0,97
Mutuality						1,46					1,83					2,75				

Activity 2 – Ex. 1-2	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	reader-writer			Obs. 1	Obs. 2			
Students	1 $B_{1,4}$	1 $B_{1,4}$	average	variance	a_{wg}	2 $B_{1,4}$	2 $B_{1,4}$	average	variance	a_{wg}	3 $B_{1,4}$	3 $B_{1,4}$	average	variance	a_{wg}	4 $B_{1,4}$	4 $B_{1,4}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87					
item 2	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00					
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 6	2,00	1,00	1,50	0,50	0,71	2,00	1,00	1,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00					
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 9	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00					
item 10	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87					
item 11	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00					
item 12	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
Average scores	1,42	1,25			0,95	1,17	1,08			0,98	2,08	1,92			0,98					
Mutuality	1,33					1,13					2,00									

Activity 2 – Ex. 3-4-5	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	reader-writer			Obs. 1	Obs. 2			
Students	1 $B_{1,4}$	1 $B_{1,4}$	average	variance	a_{wg}	2 $B_{1,4}$	2 $B_{1,4}$	average	variance	a_{wg}	3 $B_{1,4}$	3 $B_{1,4}$	average	variance	a_{wg}	4 $B_{1,4}$	4 $B_{1,4}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00					
item 2	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 6	2,00	2,00	2,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	3,00	3,00	3,00	0,00	1,00					
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 9	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87					
item 10	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00					
item 11	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87					
item 12	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00					
Average scores	1,42	1,50			0,99	1,25	1,17			0,98	2,00	2,00			0,98					
Mutuality	1,46					1,21					2,00									

Activity 3 – Ex. 1	Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	reader		
Students	1 $B_{1,4}$	1 $B_{1,4}$	average	variance	a_{wg}	2 $B_{1,4}$	2 $B_{1,4}$	average	variance	a_{wg}	3 $B_{1,4}$	3 $B_{1,4}$	average	variance	a_{wg}	4 $B_{1,4}$	4 $B_{1,4}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 10	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 11	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87
item 12	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
Average scores	1,00	1,00			1,00	1,92	1,83			0,99	1,75	1,83			0,99	2,08	2,33			0,97
Mutuality	1,00					1,88					1,79					2,21				

Activity 3 – Ex. 2-3	Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	reader		
Students	1 $B_{1,4}$	1 $B_{1,4}$	average	variance	a_{wg}	2 $B_{1,4}$	2 $B_{1,4}$	average	variance	a_{wg}	3 $B_{1,4}$	3 $B_{1,4}$	average	variance	a_{wg}	4 $B_{1,4}$	4 $B_{1,4}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00
item 10	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 11	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 12	2,00	2,00	2,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
Average scores	1,17	1,17			1,00	1,83	1,92			0,99	1,75	1,67			0,97	2,25	2,33			0,97
Mutuality	1,17					1,88					1,71					2,29				

Activity 3 – Ex. 4-5	Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	reader		
Students	1 $B_{1,4}$	1 $B_{1,4}$	average	variance	a_{wg}	2 $B_{1,4}$	2 $B_{1,4}$	average	variance	a_{wg}	3 $B_{1,4}$	3 $B_{1,4}$	average	variance	a_{wg}	4 $B_{1,4}$	4 $B_{1,4}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 10	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 11	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 12	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
Average scores	1,50	1,50			1,00	1,00	1,00			1,00	1,00	1,00			1,00	1,83	1,83			0,98
Mutuality	1,50					1,00					1,00					1,83				

1st group test	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	presenter		
Students	1 $B_{1,4}$	1 $B_{1,4}$	average	variance	a_{wg}	2 $B_{1,4}$	2 $B_{1,4}$	average	variance	a_{wg}	3 $B_{1,4}$	3 $B_{1,4}$	average	variance	a_{wg}	4 $B_{1,4}$	4 $B_{1,4}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87
item 6	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71
item 7	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 9	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 10	3,00	3,00	3,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87	5,00	4,00	4,50	0,50	0,71
item 11	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71
item 12	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	5,00	4,00	4,50	0,50	0,71
Average scores	2,08	2,00			0,99	2,00	1,92			0,99	1,92	2,08			0,98	3,25	3,17			0,89
Mutuality	2,04					1,96					2,00					3,21				

Activity 8 – Ex. 1-2	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	writer		
Students	1 $B_{1,4}$	1 $B_{1,4}$	average	variance	a_{wg}	2 $B_{1,4}$	2 $B_{1,4}$	average	variance	a_{wg}	3 $B_{1,4}$	3 $B_{1,4}$	average	variance	a_{wg}	4 $B_{1,4}$	4 $B_{1,4}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 3	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 9	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71
item 10	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 11	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 12	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
Average scores	1,17	1,17			1,00	1,00	1,00			1,00	1,17	1,17			1,00	2,92	2,58			0,94
Mutuality	1,17					1,00					1,17					2,75				

2nd group test	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer		
Students	1 $B_{1,4}$	1 $B_{1,4}$	average	variance	a_{wg}	2 $B_{1,4}$	2 $B_{1,4}$	average	variance	a_{wg}	3 $B_{1,4}$	3 $B_{1,4}$	average	variance	a_{wg}	4 $B_{1,4}$	4 $B_{1,4}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	4,00	5,00	4,50	0,50	0,71
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71
item 8	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00
item 9	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71
item 10	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 11	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 12	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
Average scores	1,00	1,00			1,00	1,67	1,67			1,00	1,33	1,17			0,97	3,00	3,08			0,93
Mutuality	1,00					1,67					1,25					3,04				

Activity 2 – Ex. 1-2	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2				Obs. 1	Obs. 2	reader-mediator		
Students	1 $B_{1,5}$	1 $B_{1,5}$	average	variance	a_{wg}	2 $B_{1,5}$	2 $B_{1,5}$	average	variance	a_{wg}	3 $B_{1,5}$	3 $B_{1,5}$	average	variance	a_{wg}	4 $B_{1,5}$	4 $B_{1,5}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87						5,00	4,00	4,50	0,50	0,71
item 2	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						4,00	4,00	4,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						4,00	4,00	4,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71						1,00	1,00	1,00	0,00	1,00
item 6	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00						4,00	3,00	3,50	0,50	0,87
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 8	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 9	5,00	4,00	4,50	0,50	0,71	3,00	3,00	3,00	0,00	1,00						4,00	5,00	4,50	0,50	0,71
item 10	4,00	5,00	4,50	0,50	0,71	2,00	3,00	2,50	0,50	0,87						5,00	4,00	4,50	0,50	0,71
item 11	5,00	4,00	4,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00						4,00	5,00	4,50	0,50	0,71
item 12	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						4,00	4,00	4,00	0,00	1,00
Average scores	2,75	2,58			0,92	1,50	1,58			0,95						3,17	3,08			0,89
Mutuality	2,67					1,54										3,13				

Activity 2 – Ex. 3-4-5	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2				Obs. 1	Obs. 2	reader-mediator		
Students	1 $B_{1,5}$	1 $B_{1,5}$	average	variance	a_{wg}	2 $B_{1,5}$	2 $B_{1,5}$	average	variance	a_{wg}	3 $B_{1,5}$	3 $B_{1,5}$	average	variance	a_{wg}	4 $B_{1,5}$	4 $B_{1,5}$	average	variance	a_{wg}
item 1	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00						4,00	4,00	4,00	0,00	1,00
item 2	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00						3,00	4,00	3,50	0,50	0,87
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						2,00	2,00	2,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 6	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						4,00	4,00	4,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 8	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						2,00	2,00	2,00	0,00	1,00
item 9	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00						4,00	4,00	4,00	0,00	1,00
item 10	3,00	2,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00						3,00	4,00	3,50	0,50	0,87
item 11	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						5,00	4,00	4,50	0,50	0,71
item 12	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00						3,00	3,00	3,00	0,00	1,00
Average scores	1,67	1,75			0,94	1,25	1,25			1,00						2,75	2,83			0,95
Mutuality	1,71					1,25										2,79				

Activity 3 – Ex. 1	Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2				Obs. 1	Obs. 2				Obs. 1	Obs. 2	writer-presenter		
Students	1 $B_{1,5}$	1 $B_{1,5}$	average	variance	a_{wg}	2 $B_{1,5}$	2 $B_{1,5}$	average	variance	a_{wg}	3 $B_{1,5}$	3 $B_{1,5}$	average	variance	a_{wg}	4 $B_{1,5}$	4 $B_{1,5}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00											4,00	4,00	4,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00											3,00	2,00	2,50	0,50	0,87
item 3	1,00	1,00	1,00	0,00	1,00											2,00	2,00	2,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00											1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00											1,00	1,00	1,00	0,00	1,00
item 6	2,00	2,00	2,00	0,00	1,00											3,00	3,00	3,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00											1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00											2,00	2,00	2,00	0,00	1,00
item 9	2,00	3,00	2,50	0,50	0,87											3,00	4,00	3,50	0,50	0,87
item 10	3,00	3,00	3,00	0,00	1,00											4,00	4,00	4,00	0,00	1,00
item 11	2,00	1,00	1,50	0,50	0,71											4,00	4,00	4,00	0,00	1,00
item 12	2,00	2,00	2,00	0,00	1,00											2,00	3,00	2,50	0,50	0,87
Average scores	1,50	1,50			0,97											2,50	2,58			0,97
Mutuality	1,50															2,54				

Activity 3 – Ex. 2-3	Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2				Obs. 1	Obs. 2				Obs. 1	Obs. 2	writer-presenter		
Students	1 $B_{1,5}$	1 $B_{1,5}$	average	variance	a_{wg}	2 $B_{1,5}$	2 $B_{1,5}$	average	variance	a_{wg}	3 $B_{1,5}$	3 $B_{1,5}$	average	variance	a_{wg}	4 $B_{1,5}$	4 $B_{1,5}$	average	variance	a_{wg}
item 1	3,00	3,00	3,00	0,00	1,00											4,00	4,00	4,00	0,00	1,00
item 2	2,00	3,00	2,50	0,50	0,87											3,00	4,00	3,50	0,50	0,87
item 3	1,00	1,00	1,00	0,00	1,00											1,00	1,00	1,00	0,00	1,00
item 4	2,00	2,00	2,00	0,00	1,00											2,00	2,00	2,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00											3,00	3,00	3,00	0,00	1,00
item 6	4,00	3,00	3,50	0,50	0,87											4,00	5,00	4,50	0,50	0,71
item 7	1,00	1,00	1,00	0,00	1,00											1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00											1,00	1,00	1,00	0,00	1,00
item 9	3,00	4,00	3,50	0,50	0,87											4,00	3,00	3,50	0,50	0,87
item 10	4,00	4,00	4,00	0,00	1,00											5,00	5,00	5,00	0,00	1,00
item 11	3,00	3,00	3,00	0,00	1,00											5,00	5,00	5,00	0,00	1,00
item 12	3,00	4,00	3,50	0,50	0,87											3,00	4,00	3,50	0,50	0,87
Average scores	2,33	2,50			0,96											3,00	3,17			0,94
Mutuality	2,42															3,08				

Activity 3 – Ex. 4-5	Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2				Obs. 1	Obs. 2				Obs. 1	Obs. 2	writer-presenter		
Students	1 $B_{1,5}$	1 $B_{1,5}$	average	variance	a_{wg}	2 $B_{1,5}$	2 $B_{1,5}$	average	variance	a_{wg}	3 $B_{1,5}$	3 $B_{1,5}$	average	variance	a_{wg}	4 $B_{1,5}$	4 $B_{1,5}$	average	variance	a_{wg}
item 1	3,00	3,00	3,00	0,00	1,00											5,00	5,00	5,00	0,00	1,00
item 2	3,00	3,00	3,00	0,00	1,00											4,00	5,00	4,50	0,50	0,71
item 3	1,00	1,00	1,00	0,00	1,00											1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00											1,00	1,00	1,00	0,00	1,00
item 5	2,00	2,00	2,00	0,00	1,00											1,00	1,00	1,00	0,00	1,00
item 6	2,00	2,00	2,00	0,00	1,00											5,00	4,00	4,50	0,50	0,71
item 7	1,00	1,00	1,00	0,00	1,00											4,00	4,00	4,00	0,00	1,00
item 8	3,00	3,00	3,00	0,00	1,00											5,00	5,00	5,00	0,00	1,00
item 9	3,00	3,00	3,00	0,00	1,00											4,00	4,00	4,00	0,00	1,00
item 10	4,00	3,00	3,50	0,50	0,87											5,00	4,00	4,50	0,50	0,71
item 11	3,00	3,00	3,00	0,00	1,00											5,00	5,00	5,00	0,00	1,00
item 12	4,00	3,00	3,50	0,50	0,87											4,00	5,00	4,50	0,50	0,71
Average scores	2,50	2,33			0,98											3,67	3,67			0,90
Mutuality	2,42															3,67				

1st group test	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer		
Students	1 $B_{1,5}$	1 $B_{1,5}$	average	variance	a_{wg}	2 $B_{1,5}$	2 $B_{1,5}$	average	variance	a_{wg}	3 $B_{1,5}$	3 $B_{1,5}$	average	variance	a_{wg}	4 $B_{1,5}$	4 $B_{1,5}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	5,00	4,00	4,50	0,50	0,71
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 6	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 7	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87
item 8	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00
item 9	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 10	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	5,00	4,00	4,50	0,50	0,71
item 11	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 12	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87
Average scores	1,58	1,58			1,00	1,17	1,17			1,00	1,92	1,92			0,93	3,42	3,42			0,93
Mutuality	1,58					1,17					1,92					3,42				

Activity 8 – Ex. 1-2	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	1 $B_{1,5}$	1 $B_{1,5}$	average	variance	a_{wg}	2 $B_{1,5}$	2 $B_{1,5}$	average	variance	a_{wg}	3 $B_{1,5}$	3 $B_{1,5}$	average	variance	a_{wg}	4 $B_{1,5}$	4 $B_{1,5}$	average	variance	a_{wg}
item 1	3,00	4,00	3,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
item 2	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 5	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 6	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 9	3,00	2,00	2,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 10	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	5,00	4,00	4,50	0,50	0,71
item 11	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87
item 12	3,00	2,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
Average scores	2,50	2,42			0,97	1,75	1,75			0,98	1,33	1,25			0,98	3,17	2,92			0,92
Mutuality	2,46					1,75					1,29					3,04				

2nd group test	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	presenter		
Students	1 $B_{1,5}$	1 $B_{1,5}$	average	variance	a_{wg}	2 $B_{1,5}$	2 $B_{1,5}$	average	variance	a_{wg}	3 $B_{1,5}$	3 $B_{1,5}$	average	variance	a_{wg}	4 $B_{1,5}$	4 $B_{1,5}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	3,00	2,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 6	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71
item 7	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 8	3,00	4,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	4,00	5,00	4,50	0,50	0,71
item 9	4,00	4,00	4,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 10	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87
item 11	4,00	3,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 12	3,00	3,00	3,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87
Average scores	2,42	2,33			0,97	1,58	1,67			0,95	2,08	2,00			0,97	3,25	3,25			0,93
Mutuality	2,38					1,63					2,04					3,25				

Activity 2 – Ex. 1-2	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	mediator		
Students	1 $B_{1,6}$	1 $B_{1,6}$	average	variance	a_{wg}	2 $B_{1,6}$	2 $B_{1,6}$	average	variance	a_{wg}	3 $B_{1,6}$	3 $B_{1,6}$	average	variance	a_{wg}	4 $B_{1,6}$	4 $B_{1,6}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 3	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 10	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 11	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 12	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
Average scores	1,92	1,92			0,98	1,00	1,00			1,00	1,75	1,58			0,98	1,00	1,00			1,00
Mutuality	1,92					1,00					1,67					1,00				

Activity 2 – Ex. 3-4-5	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	mediator		
Students	1 $B_{1,6}$	1 $B_{1,6}$	average	variance	a_{wg}	2 $B_{1,6}$	2 $B_{1,6}$	average	variance	a_{wg}	3 $B_{1,6}$	3 $B_{1,6}$	average	variance	a_{wg}	4 $B_{1,6}$	4 $B_{1,6}$	average	variance	a_{wg}
item 1	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 3	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 10	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 11	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 12	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
Average scores	1,67	1,67			0,97	1,08	1,08			1,00	1,50	1,58			0,94	1,17	1,17			1,00
Mutuality	1,67					1,08					1,54					1,17				

Activity 3 – Ex. 1	Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	reader		
Students	1 $B_{1,6}$	1 $B_{1,6}$	average	variance	a_{wg}	2 $B_{1,6}$	2 $B_{1,6}$	average	variance	a_{wg}	3 $B_{1,6}$	3 $B_{1,6}$	average	variance	a_{wg}	4 $B_{1,6}$	4 $B_{1,6}$	average	variance	a_{wg}
item 1	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 2	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	2,00	2,00	2,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	2,00	1,00	1,50	0,50	0,71	2,00	1,00	1,50	0,50	0,71
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 10	4,00	3,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 11	3,00	4,00	3,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87	2,00	1,00	1,50	0,50	0,71
item 12	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
Average scores	2,33	2,33			0,98	1,42	1,42			0,97	1,75	1,75			0,97	1,75	1,50			0,93
Mutuality	2,33					1,42					1,75					1,63				

Activity 3 – Ex. 2-3	Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	reader		
Students	1 $B_{1,6}$	1 $B_{1,6}$	average	variance	a_{wg}	2 $B_{1,6}$	2 $B_{1,6}$	average	variance	a_{wg}	3 $B_{1,6}$	3 $B_{1,6}$	average	variance	a_{wg}	4 $B_{1,6}$	4 $B_{1,6}$	average	variance	a_{wg}
item 1	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	2,00	1,00	1,50	0,50	0,71
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00
item 10	2,00	3,00	2,50	0,50	0,87	2,00	1,00	1,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
item 11	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 12	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
Average scores	2,00	2,00			0,98	1,08	1,00			0,98	1,58	1,33			0,94	1,25	1,08			0,95
Mutuality	2,00					1,04					1,46					1,17				

Activity 3 – Ex. 4-5	Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2			
Students	1 $B_{1,6}$	1 $B_{1,6}$	average	variance	a_{wg}	2 $B_{1,6}$	2 $B_{1,6}$	average	variance	a_{wg}	3 $B_{1,6}$	3 $B_{1,6}$	average	variance	a_{wg}	4 $B_{1,6}$	4 $B_{1,6}$	average	variance	a_{wg}
item 1	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 2	3,00	4,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71					
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 4	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 5	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 6	4,00	5,00	4,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 9	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 10	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 11	4,00	5,00	4,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71					
item 12	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
Average scores	2,50	2,67			0,93	1,17	1,17			1,00	1,33	1,33			0,95					
Mutuality	2,58					1,17					1,33									

1st group test	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	reader		
Students	1 $B_{1,6}$	1 $B_{1,6}$	average	variance	a_{wg}	2 $B_{1,6}$	2 $B_{1,6}$	average	variance	a_{wg}	3 $B_{1,6}$	3 $B_{1,6}$	average	variance	a_{wg}	4 $B_{1,6}$	4 $B_{1,6}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
item 6	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 10	3,00	2,00	2,50	0,50	0,87	2,00	1,00	1,50	0,50	0,71	3,00	4,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00
item 11	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 12	2,00	3,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
Average scores	2,00	2,00			0,98	1,42	1,33			0,98	2,25	2,42			0,98	1,42	1,33			0,98
Mutuality	2,00					1,38					2,33					1,38				

Activity 8 – Ex. 1-2	Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter		
Students	1 $B_{1,6}$	1 $B_{1,6}$	average	variance	a_{wg}	2 $B_{1,6}$	2 $B_{1,6}$	average	variance	a_{wg}	3 $B_{1,6}$	3 $B_{1,6}$	average	variance	a_{wg}	4 $B_{1,6}$	4 $B_{1,6}$	average	variance	a_{wg}
item 1	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 10	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 11	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 12	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
Average scores	2,33	2,25			0,97	1,00	1,00			1,00	1,25	1,25			1,00	1,08	1,08			1,00
Mutuality	2,29					1,00					1,25					1,08				

2nd group test	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	mediator		
Students	1 $B_{1,6}$	1 $B_{1,6}$	average	variance	a_{wg}	2 $B_{1,6}$	2 $B_{1,6}$	average	variance	a_{wg}	3 $B_{1,6}$	3 $B_{1,6}$	average	variance	a_{wg}	4 $B_{1,6}$	4 $B_{1,6}$	average	variance	a_{wg}
item 1	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 7	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 8	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 9	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 10	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 11	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 12	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
Average scores	2,17	2,25			0,97	1,00	1,00			1,00	1,67	1,58			0,95	1,17	1,17			1,00
Mutuality	2,21					1,00					1,63					1,17				

Appendix C.2.3: Observation protocols of the mutuality parameter - Class C_2

Activity 2 – Ex. 1-2	Obs. 1	Obs. 2	writer-presenter			Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2			
Students	1 $C_{2,1}$	1 $C_{2,1}$	average	variance	a_{wg}	2 $C_{2,1}$	2 $C_{2,1}$	average	variance	a_{wg}	3 $C_{2,1}$	3 $C_{2,1}$	average	variance	a_{wg}
item 1	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00					
item 2	5,00	5,00	5,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 3	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 4	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 5	3,00	4,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00					
item 6	5,00	5,00	5,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71					
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 9	5,00	5,00	5,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 10	5,00	5,00	5,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 11	5,00	4,00	4,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00					
item 12	4,00	5,00	4,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00					
Average scores	3,75	3,75			0,93	1,33	1,25			0,98					
Mutuality	3,75					1,29									

Activity 2 – Ex. 3-4-5	Obs. 1	Obs. 2	writer-presenter			Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2			
Students	1 $C_{2,1}$	1 $C_{2,1}$	average	variance	a_{wg}	2 $C_{2,1}$	2 $C_{2,1}$	average	variance	a_{wg}	3 $C_{2,1}$	3 $C_{2,1}$	average	variance	a_{wg}
item 1	3,00	3,00	3,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71					
item 2	3,00	4,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00					
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 6	4,00	3,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00					
item 7	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 9	4,00	3,00	3,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87					
item 10	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00					
item 11	4,00	5,00	4,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00					
item 12	4,00	4,00	4,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87					
Average scores	2,67	2,67			0,94	1,75	1,67			0,95					
Mutuality	2,67					1,71									

Activity 3 – Ex. 1	Obs. 1	Obs. 2				Obs. 1	Obs. 2				Obs. 1	Obs. 2			
Students	1 $C_{2,1}$	1 $C_{2,1}$	average	variance	a_{wg}	2 $C_{2,1}$	2 $C_{2,1}$	average	variance	a_{wg}	3 $C_{2,1}$	3 $C_{2,1}$	average	variance	a_{wg}
item 1															
item 2															
item 3															
item 4															
item 5															
item 6															
item 7															
item 8															
item 9															
item 10															
item 11															
item 12															
Average scores															
Mutuality															

Activity 3 – Ex. 2-3	Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	writer-presenter			Obs. 1	Obs. 2			
Students	1 $C_{2,1}$	1 $C_{2,1}$	average	variance	a_{wg}	2 $C_{2,1}$	2 $C_{2,1}$	average	variance	a_{wg}	3 $C_{2,1}$	3 $C_{2,1}$	average	variance	a_{wg}
item 1	4,00	5,00	4,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00					
item 2	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 4	5,00	5,00	5,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 5	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 6	4,00	3,00	3,50	0,50	0,87	2,00	1,00	1,50	0,50	0,71					
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 9	5,00	4,00	4,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00					
item 10	5,00	5,00	5,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00					
item 11	4,00	5,00	4,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00					
item 12	5,00	5,00	5,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71					
Average scores	3,58	3,58			0,92	1,42	1,42			0,95					
Mutuality	3,58					1,42									

Activity 3 – Ex. 4-5	Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	writer-presenter			Obs. 1	Obs. 2			
Students	1 $C_{2,1}$	1 $C_{2,1}$	average	variance	a_{wg}	2 $C_{2,1}$	2 $C_{2,1}$	average	variance	a_{wg}	3 $C_{2,1}$	3 $C_{2,1}$	average	variance	a_{wg}
item 1	4,00	3,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00					
item 2	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00					
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 4	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 5	5,00	5,00	5,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 6	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 9	3,00	4,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00					
item 10	3,00	3,00	3,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71					
item 11	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00					
item 12	3,00	4,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00					
Average scores	2,92	2,83			0,94	1,33	1,25			0,98					
Mutuality	2,88					1,29									

1st group test	Obs. 1	Obs. 2				Obs. 1	Obs. 2				Obs. 1	Obs. 2			
Students	1 $C_{2,1}$	1 $C_{2,1}$	average	variance	a_{wg}	2 $C_{2,1}$	2 $C_{2,1}$	average	variance	a_{wg}	3 $C_{2,1}$	3 $C_{2,1}$	average	variance	a_{wg}
item 1															
item 2															
item 3															
item 4															
item 5															
item 6															
item 7															
item 8															
item 9															
item 10															
item 11															
item 12															
Average scores															
Mutuality															

Activity 8 – Ex. 1-2	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader-mediator		
Students	1 $C_{2,1}$	1 $C_{2,1}$	average	variance	a_{wg}	2 $C_{2,1}$	2 $C_{2,1}$	average	variance	a_{wg}	3 $C_{2,1}$	3 $C_{2,1}$	average	variance	a_{wg}
item 1	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 3	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	3,00	4,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	3,00	4,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 10	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 11	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 12	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
Average scores	2,58	2,58			0,96	1,08	1,08			1,00	1,00	1,00			1,00
Mutuality	2,58					1,08					1,00				

2nd group test	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	writer		
Students	1 $C_{2,1}$	1 $C_{2,1}$	average	variance	a_{wg}	2 $C_{2,1}$	2 $C_{2,1}$	average	variance	a_{wg}	3 $C_{2,1}$	3 $C_{2,1}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 3	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 7	3,00	3,00	3,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00
item 8	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 10	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 11	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 12	3,00	4,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
Average scores	3,00	2,92			0,95	1,25	1,17			0,98	1,25	1,25			1,00
Mutuality	2,96					1,21					1,25				

Activity 2 – Ex. 1-2	Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2			
Students	1 $C_{2,2}$	1 $C_{2,2}$	average	variance	a_{wg}	2 $C_{2,2}$	2 $C_{2,2}$	average	variance	a_{wg}	3 $C_{2,2}$	3 $C_{2,2}$	average	variance	a_{wg}	4 $C_{2,2}$	4 $C_{2,2}$	average	variance	a_{wg}
item 1	3,00	4,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 2	4,00	4,00	4,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00					
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 4	3,00	2,00	2,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00					
item 5	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 6	2,00	2,00	2,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00					
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 8	3,00	4,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 9	5,00	4,00	4,50	0,50	0,71	4,00	4,00	4,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87					
item 10	5,00	5,00	5,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71	3,00	3,00	3,00	0,00	1,00					
item 11	5,00	4,00	4,50	0,50	0,71	3,00	3,00	3,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71					
item 12	5,00	4,00	4,50	0,50	0,71	4,00	5,00	4,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00					
Average scores	3,17	3,00			0,90	2,83	2,58			0,92	1,58	1,58			0,97					
Mutuality	3,08					2,71					1,58									

Activity 2 – Ex. 3-4-5	Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2			
Students	1 $C_{2,2}$	1 $C_{2,2}$	average	variance	a_{wg}	2 $C_{2,2}$	2 $C_{2,2}$	average	variance	a_{wg}	3 $C_{2,2}$	3 $C_{2,2}$	average	variance	a_{wg}	4 $C_{2,2}$	4 $C_{2,2}$	average	variance	a_{wg}
item 1	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 2	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 3	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 6	4,00	3,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 7	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71					
item 8	3,00	4,00	3,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00					
item 9	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 10	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 11	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71					
item 12	4,00	5,00	4,50	0,50	0,71	4,00	5,00	4,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00					
Average scores	3,17	3,17			0,94	2,58	2,75			0,97	1,25	1,25			0,95					
Mutuality	3,17					2,67					1,25									

Activity 3 – Ex. 1	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter		
Students	1 $C_{2,2}$	1 $C_{2,2}$	average	variance	a_{wg}	2 $C_{2,2}$	2 $C_{2,2}$	average	variance	a_{wg}	3 $C_{2,2}$	3 $C_{2,2}$	average	variance	a_{wg}	4 $C_{2,2}$	4 $C_{2,2}$	average	variance	a_{wg}
item 1	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 3	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 6	1,00	2,00	1,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 10	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
item 11	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 12	3,00	2,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
Average scores	1,83	1,75			0,94	1,92	1,92			1,00	1,00	1,00			1,00	1,50	1,42			0,98
Mutuality	1,79					1,92					1,00					1,46				

Activity 3 – Ex. 2-3	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter		
Students	1 $C_{2,2}$	1 $C_{2,2}$	average	variance	a_{wg}	2 $C_{2,2}$	2 $C_{2,2}$	average	variance	a_{wg}	3 $C_{2,2}$	3 $C_{2,2}$	average	variance	a_{wg}	4 $C_{2,2}$	4 $C_{2,2}$	average	variance	a_{wg}
item 1	4,00	3,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	3,00	4,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	4,00	3,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	4,00	4,00	4,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 10	4,00	3,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	2,00	1,00	1,50	0,50	0,71
item 11	4,00	4,00	4,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 12	3,00	4,00	3,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
Average scores	2,83	2,75			0,94	2,08	2,00			0,97	1,08	1,00			0,98	1,08	1,00			0,98
Mutuality	2,79					2,04					1,04					1,04				

Activity 3 – Ex. 4-5	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter		
Students	1 $C_{2,2}$	1 $C_{2,2}$	average	variance	a_{wg}	2 $C_{2,2}$	2 $C_{2,2}$	average	variance	a_{wg}	3 $C_{2,2}$	3 $C_{2,2}$	average	variance	a_{wg}	4 $C_{2,2}$	4 $C_{2,2}$	average	variance	a_{wg}
item 1	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	4,00	4,00	4,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	2,00	2,00	2,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	4,00	3,00	3,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	4,00	3,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 10	3,00	4,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
item 11	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 12	4,00	5,00	4,50	0,50	0,71	3,00	4,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
Average scores	2,75	2,75			0,94	2,75	2,67			0,94	1,08	1,08			1,00	1,25	1,25			0,95
Mutuality	2,75					2,71					1,08					1,25				

1st group test	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2			
Students	1 $C_{2,2}$	1 $C_{2,2}$	average	variance	a_{wg}	2 $C_{2,2}$	2 $C_{2,2}$	average	variance	a_{wg}	3 $C_{2,2}$	3 $C_{2,2}$	average	variance	a_{wg}	4 $C_{2,2}$	4 $C_{2,2}$	average	variance	a_{wg}
item 1	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 2	4,00	3,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00					
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 6	1,00	2,00	1,50	0,50	0,71	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00					
item 7	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 8	2,00	3,00	2,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 9	4,00	3,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00					
item 10	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 11	3,00	4,00	3,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 12	3,00	4,00	3,50	0,50	0,87	5,00	4,00	4,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00					
Average scores	2,33	2,50			0,92	3,08	2,75			0,94	1,17	1,17			1,00					
Mutuality	2,42					2,92					1,17									

Activity 8 – Ex. 1-2	Obs. 1	Obs. 2	writer-mediator			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2			
Students	1 $C_{2,2}$	1 $C_{2,2}$	average	variance	a_{wg}	2 $C_{2,2}$	2 $C_{2,2}$	average	variance	a_{wg}	3 $C_{2,2}$	3 $C_{2,2}$	average	variance	a_{wg}	4 $C_{2,2}$	4 $C_{2,2}$	average	variance	a_{wg}
item 1	5,00	4,00	4,50	0,50	0,71	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 2	5,00	4,00	4,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 4	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 5	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 6	5,00	4,00	4,50	0,50	0,71	4,00	5,00	4,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00					
item 7	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 8	3,00	3,00	3,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00					
item 9	4,00	5,00	4,50	0,50	0,71	5,00	4,00	4,50	0,50	0,71	1,00	2,00	1,50	0,50	0,71					
item 10	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 11	4,00	3,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 12	4,00	5,00	4,50	0,50	0,71	5,00	4,00	4,50	0,50	0,71	2,00	1,00	1,50	0,50	0,71					
Average scores	3,50	3,33			0,87	3,33	3,17			0,90	1,25	1,25			0,95					
Mutuality	3,42					3,25					1,25									

2nd group test	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter		
Students	1 $C_{2,2}$	1 $C_{2,2}$	average	variance	a_{wg}	2 $C_{2,2}$	2 $C_{2,2}$	average	variance	a_{wg}	3 $C_{2,2}$	3 $C_{2,2}$	average	variance	a_{wg}	4 $C_{2,2}$	4 $C_{2,2}$	average	variance	a_{wg}
item 1	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	2,00	1,00	1,50	0,50	0,71	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 7	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 8	4,00	4,00	4,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	5,00	4,00	4,50	0,50	0,71	4,00	5,00	4,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 10	5,00	5,00	5,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
item 11	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 12	4,00	5,00	4,50	0,50	0,71	5,00	4,00	4,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
Average scores	3,08	3,00			0,93	3,00	2,92			0,91	1,08	1,08			1,00	1,25	1,17			0,98
Mutuality	3,04					2,96					1,08					1,21				

Activity 2 – Ex. 1-2	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2			
Students	1 $C_{2,4}$	1 $C_{2,4}$	average	variance	a_{wg}	2 $C_{2,4}$	2 $C_{2,4}$	average	variance	a_{wg}	3 $C_{2,4}$	3 $C_{2,4}$	average	variance	a_{wg}	4 $C_{2,5}$	4 $C_{2,5}$	average	variance	a_{wg}
item 1	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 2	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71					
item 3	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 5	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 6	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 9	2,00	1,00	1,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71					
item 10	3,00	3,00	3,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00					
item 11	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 12	2,00	3,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
Average scores	1,67	1,67			0,97	2,25	2,17			0,99	1,25	1,25			0,95					
Mutuality	1,67					2,21					1,25									

Activity 2 – Ex. 3-4-5	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2			
Students	1 $C_{2,4}$	1 $C_{2,4}$	average	variance	a_{wg}	2 $C_{2,4}$	2 $C_{2,4}$	average	variance	a_{wg}	3 $C_{2,4}$	3 $C_{2,4}$	average	variance	a_{wg}	4 $C_{2,5}$	4 $C_{2,5}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00					
item 2	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00					
item 3	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 5	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 6	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 9	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 10	2,00	2,00	2,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00					
item 11	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 12	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
Average scores	1,17	1,17			1,00	1,33	1,42			0,93	1,00	1,00			1,00					
Mutuality	1,17					1,38					1,00									

Activity 3 – Ex. 1	Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	writer		
Students	1 $C_{2,4}$	1 $C_{2,4}$	average	variance	a_{wg}	2 $C_{2,4}$	2 $C_{2,4}$	average	variance	a_{wg}	3 $C_{2,4}$	3 $C_{2,4}$	average	variance	a_{wg}	4 $C_{2,5}$	4 $C_{2,5}$	average	variance	a_{wg}
item 1	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 2	3,00	2,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	2,00	3,00	2,50	0,50	0,87	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 10	4,00	3,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 11	4,00	4,00	4,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	2,00	1,00	1,50	0,50	0,71	3,00	3,00	3,00	0,00	1,00
item 12	3,00	4,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
Average scores	2,25	2,25			0,96	1,75	1,58			0,95	1,33	1,25			0,98	1,83	1,92			0,98
Mutuality	2,25					1,67					1,29					1,88				

Activity 3 – Ex. 2-3	Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	writer		
Students	1 $C_{2,4}$	1 $C_{2,4}$	average	variance	a_{wg}	2 $C_{2,4}$	2 $C_{2,4}$	average	variance	a_{wg}	3 $C_{2,4}$	3 $C_{2,4}$	average	variance	a_{wg}	4 $C_{2,5}$	4 $C_{2,5}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
item 6	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 10	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
item 11	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 12	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
Average scores	1,33	1,33			0,95	1,00	1,00			1,00	1,08	1,08			1,00	1,67	1,50			0,95
Mutuality	1,33					1,00					1,08					1,58				

Activity 3 – Ex. 4-5	Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	writer		
Students	1 $C_{2,4}$	1 $C_{2,4}$	average	variance	a_{wg}	2 $C_{2,4}$	2 $C_{2,4}$	average	variance	a_{wg}	3 $C_{2,4}$	3 $C_{2,4}$	average	variance	a_{wg}	4 $C_{2,5}$	4 $C_{2,5}$	average	variance	a_{wg}
item 1	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 10	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 11	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 12	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
Average scores	1,83	1,75			0,97	1,08	1,08			1,00	1,00	1,00			1,00	1,08	1,08			1,00
Mutuality	1,79					1,08					1,00					1,08				

1st group test	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2				Obs. 1	Obs. 2	writer		
Students	1 $C_{2,4}$	1 $C_{2,4}$	average	variance	a_{wg}	2 $C_{2,4}$	2 $C_{2,4}$	average	variance	a_{wg}	3 $C_{2,4}$	3 $C_{2,4}$	average	variance	a_{wg}	4 $C_{2,5}$	4 $C_{2,5}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 2	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00						2,00	2,00	2,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 4	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00						2,00	2,00	2,00	0,00	1,00
item 6	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						1,00	2,00	1,50	0,50	0,71
item 7	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						2,00	2,00	2,00	0,00	1,00
item 8	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 9	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						2,00	2,00	2,00	0,00	1,00
item 10	3,00	3,00	3,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71						2,00	2,00	2,00	0,00	1,00
item 11	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 12	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00						2,00	1,00	1,50	0,50	0,71
Average scores	2,08	1,83			0,92	1,08	1,17			0,98						1,50	1,50			0,95
Mutuality	1,96					1,13										1,50				

Activity 8 – Ex. 1-2	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	mediator		
Students	1 $C_{2,4}$	1 $C_{2,4}$	average	variance	a_{wg}	2 $C_{2,4}$	2 $C_{2,4}$	average	variance	a_{wg}	3 $C_{2,4}$	3 $C_{2,4}$	average	variance	a_{wg}	4 $C_{2,5}$	4 $C_{2,5}$	average	variance	a_{wg}
item 1	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 7	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 10	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 11	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 12	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
Average scores	2,17	2,25			0,92	1,00	1,00			1,00	1,58	1,58			1,00	1,25	1,25			1,00
Mutuality	2,21					1,00										1,25				

2nd group test	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter		
Students	1 $C_{2,4}$	1 $C_{2,4}$	average	variance	a_{wg}	2 $C_{2,4}$	2 $C_{2,4}$	average	variance	a_{wg}	3 $C_{2,4}$	3 $C_{2,4}$	average	variance	a_{wg}	4 $C_{2,5}$	4 $C_{2,5}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 8	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 9	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 10	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 11	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 12	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
Average scores	1,33	1,25			0,93	1,08	1,17			0,99	1,42	1,50			0,98	1,42	1,33			0,94
Mutuality	1,29					1,13					1,46					1,38				

Activity 2 – Ex. 1-2	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2			
Students	1 $C_{2,5}$	1 $C_{2,5}$	average	variance	a_{wg}	2 $C_{2,5}$	2 $C_{2,5}$	average	variance	a_{wg}	3 $C_{2,5}$	3 $C_{2,5}$	average	variance	a_{wg}	4 $C_{2,5}$	4 $C_{2,5}$	average	variance	a_{wg}
item 1	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71					
item 2	3,00	4,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71					
item 3	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 6	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 8	3,00	4,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 9	3,00	4,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87					
item 10	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00					
item 11	5,00	4,00	4,50	0,50	0,71	3,00	2,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00					
item 12	3,00	4,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87					
Average scores	2,67	2,92			0,93	1,83	1,75			0,99	1,92	1,92			0,93					
Mutuality	2,79					1,79					1,92									

Activity 2 – Ex. 3-4-5	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2			
Students	1 $C_{2,5}$	1 $C_{2,5}$	average	variance	a_{wg}	2 $C_{2,5}$	2 $C_{2,5}$	average	variance	a_{wg}	3 $C_{2,5}$	3 $C_{2,5}$	average	variance	a_{wg}	4 $C_{2,5}$	4 $C_{2,5}$	average	variance	a_{wg}
item 1	3,00	4,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 2	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 5	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71					
item 6	3,00	4,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 9	4,00	4,00	4,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00					
item 10	4,00	3,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87					
item 11	5,00	5,00	5,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00					
item 12	3,00	4,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87					
Average scores	2,58	2,75			0,96	1,67	1,50			0,98	1,58	1,50			0,95					
Mutuality	2,67					1,58					1,54									

Activity 3 – Ex. 1	Obs. 1	Obs. 2				Obs. 1	Obs. 2				Obs. 1	Obs. 2				Obs. 1	Obs. 2			
Students	1 $C_{2,5}$	1 $C_{2,5}$	average	variance	a_{wg}	2 $C_{2,5}$	2 $C_{2,5}$	average	variance	a_{wg}	3 $C_{2,5}$	3 $C_{2,5}$	average	variance	a_{wg}	4 $C_{2,5}$	4 $C_{2,5}$	average	variance	a_{wg}
item 1																				
item 2																				
item 3																				
item 4																				
item 5																				
item 6																				
item 7																				
item 8																				
item 9																				
item 10																				
item 11																				
item 12																				
Average scores																				
Mutuality																				

Activity 3 – Ex. 2-3	Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter		
Students	1 $C_{2,5}$	1 $C_{2,5}$	average	variance	a_{wg}	2 $C_{2,5}$	2 $C_{2,5}$	average	variance	a_{wg}	3 $C_{2,5}$	3 $C_{2,5}$	average	variance	a_{wg}	4 $C_{2,5}$	4 $C_{2,5}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 3	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	3,00	3,00	3,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 10	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 11	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 12	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
Average scores	1,58	1,67			0,98	1,17	1,08			0,98	1,17	1,17			1,00	1,33	1,25			0,98
Mutuality	1,63					1,13					1,17					1,29				

Activity 3 – Ex. 4-5	Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter		
Students	1 $C_{2,5}$	1 $C_{2,5}$	average	variance	a_{wg}	2 $C_{2,5}$	2 $C_{2,5}$	average	variance	a_{wg}	3 $C_{2,5}$	3 $C_{2,5}$	average	variance	a_{wg}	4 $C_{2,5}$	4 $C_{2,5}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 3	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 10	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 11	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 12	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
Average scores	1,08	1,08			1,00	1,00	1,00			1,00	1,00	1,00			1,00	1,00	1,00			1,00
Mutuality	1,08					1,00					1,00					1,00				

1st group test	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2				Obs. 1	Obs. 2	presenter		
Students	1 $C_{2,5}$	1 $C_{2,5}$	average	variance	a_{wg}	2 $C_{2,5}$	2 $C_{2,5}$	average	variance	a_{wg}	3 $C_{2,5}$	3 $C_{2,5}$	average	variance	a_{wg}	4 $C_{2,5}$	4 $C_{2,5}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 2	3,00	2,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00						2,00	2,00	2,00	0,00	1,00
item 6	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 7	2,00	1,00	1,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 8	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 9	3,00	2,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 10	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 11	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 12	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
Average scores	2,08	1,92			0,94	1,58	1,58			1,00						1,08	1,08			1,00
Mutuality	2,00					1,58										1,08				

Activity 8 – Ex. 1-2	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer		
Students	1 $C_{2,5}$	1 $C_{2,5}$	average	variance	a_{wg}	2 $C_{2,5}$	2 $C_{2,5}$	average	variance	a_{wg}	3 $C_{2,5}$	3 $C_{2,5}$	average	variance	a_{wg}	4 $C_{2,5}$	4 $C_{2,5}$	average	variance	a_{wg}
item 1	2,00	3,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 2	3,00	3,00	3,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 3	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 4	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 7	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 8	2,00	3,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 10	4,00	3,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 11	4,00	4,00	4,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 12	3,00	4,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
Average scores	2,42	2,58			0,96	2,25	2,17			0,97	1,00	1,00			1,00	1,67	1,58			0,98
Mutuality	2,50					2,21					1,00					1,63				

2nd group test	Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter		
Students	1 $C_{2,5}$	1 $C_{2,5}$	average	variance	a_{wg}	2 $C_{2,5}$	2 $C_{2,5}$	average	variance	a_{wg}	3 $C_{2,5}$	3 $C_{2,5}$	average	variance	a_{wg}	4 $C_{2,5}$	4 $C_{2,5}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	3,00	3,00	3,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 7	2,00	2,00	2,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 8	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 9	3,00	4,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 10	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 11	4,00	3,00	3,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
item 12	4,00	3,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
Average scores	2,42	2,33			0,97	2,08	2,00			0,97	1,17	1,17			1,00	1,92	1,83			0,95
Mutuality	2,38					2,04					1,17					1,88				

Activity 2 – Ex. 1-2	Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	writer-presenter			Obs. 1	Obs. 2			
Students	1 $C_{2,6}$	1 $C_{2,6}$	average	variance	a_{wg}	2 $C_{2,6}$	2 $C_{2,6}$	average	variance	a_{wg}	3 $C_{2,6}$	3 $C_{2,6}$	average	variance	a_{wg}
item 1	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00					
item 2	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 3	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 4	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 5	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 6	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00					
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 9	4,00	5,00	4,50	0,50	0,71	4,00	4,00	4,00	0,00	1,00					
item 10	4,00	4,00	4,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87					
item 11	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00					
item 12	3,00	4,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87					
Average scores	2,50	2,75			0,95	2,42	2,25			0,98					
Mutuality	2,63					2,33									

Activity 2 – Ex. 3-4-5	Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	writer-presenter			Obs. 1	Obs. 2			
Students	1 $C_{2,6}$	1 $C_{2,6}$	average	variance	a_{wg}	2 $C_{2,6}$	2 $C_{2,6}$	average	variance	a_{wg}	3 $C_{2,6}$	3 $C_{2,6}$	average	variance	a_{wg}
item 1	2,00	2,00	2,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87					
item 2	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 5	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 6	3,00	3,00	3,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71					
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 8	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 9	4,00	3,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00					
item 10	3,00	3,00	3,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87					
item 11	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00					
item 12	4,00	3,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87					
Average scores	2,25	2,08			0,98	2,25	1,92			0,94					
Mutuality	2,17					2,08									

Activity 3 – Ex. 1	Obs. 1	Obs. 2	writer-presenter			Obs. 1	Obs. 2				Obs. 1	Obs. 2	reader-mediator		
Students	1 $C_{2,6}$	1 $C_{2,6}$	average	variance	a_{wg}	2 $C_{2,6}$	2 $C_{2,6}$	average	variance	a_{wg}	3 $C_{2,6}$	3 $C_{2,6}$	average	variance	a_{wg}
item 1	3,00	2,00	2,50	0,50	0,87						1,00	1,00	1,00	0,00	1,00
item 2	3,00	3,00	3,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 6	2,00	3,00	2,50	0,50	0,87						1,00	1,00	1,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 9	2,00	1,00	1,50	0,50	0,71						1,00	1,00	1,00	0,00	1,00
item 10	3,00	3,00	3,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 11	2,00	1,00	1,50	0,50	0,71						1,00	1,00	1,00	0,00	1,00
item 12	2,00	3,00	2,50	0,50	0,87						1,00	1,00	1,00	0,00	1,00
Average scores	1,83	1,75			0,92						1,00	1,00			1,00
Mutuality	1,79										1,00				

Activity 3 – Ex. 2-3	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader-mediator		
Students	1 $C_{2,6}$	1 $C_{2,6}$	average	variance	a_{wg}	2 $C_{2,6}$	2 $C_{2,6}$	average	variance	a_{wg}	3 $C_{2,6}$	3 $C_{2,6}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 4	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	4,00	5,00	4,50	0,50	0,71	3,00	2,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00
item 10	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 11	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 12	3,00	4,00	3,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
Average scores	1,83	2,00			0,97	1,83	1,67			0,94	1,17	1,17			1,00
Mutuality	1,92					1,75					1,17				

Activity 3 – Ex. 4-5	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader-mediator		
Students	1 $C_{2,6}$	1 $C_{2,6}$	average	variance	a_{wg}	2 $C_{2,6}$	2 $C_{2,6}$	average	variance	a_{wg}	3 $C_{2,6}$	3 $C_{2,6}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	3,00	4,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 10	3,00	4,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87	2,00	1,00	1,50	0,50	0,71
item 11	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 12	4,00	3,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00
Average scores	2,42	2,50			0,97	2,42	2,25			0,98	1,17	1,08			0,98
Mutuality	2,46					2,33					1,13				

1st group test	Obs. 1	Obs. 2				Obs. 1	Obs. 2				Obs. 1	Obs. 2			
Students	1 $C_{2,6}$	1 $C_{2,6}$	average	variance	a_{wg}	2 $C_{2,6}$	2 $C_{2,6}$	average	variance	a_{wg}	3 $C_{2,6}$	3 $C_{2,6}$	average	variance	a_{wg}
item 1															
item 2															
item 3															
item 4															
item 5															
item 6															
item 7															
item 8															
item 9															
item 10															
item 11															
item 12															
Average scores															
Mutuality															

Activity 8 – Ex. 1-2	Obs. 1	Obs. 2				Obs. 1	Obs. 2				Obs. 1	Obs. 2			
Students	1 $C_{2,6}$	1 $C_{2,6}$	average	variance	a_{wg}	2 $C_{2,6}$	2 $C_{2,6}$	average	variance	a_{wg}	3 $C_{2,6}$	3 $C_{2,6}$	average	variance	a_{wg}
item 1															
item 2															
item 3															
item 4															
item 5															
item 6															
item 7															
item 8															
item 9															
item 10															
item 11															
item 12															
Average scores															
Mutuality															

2nd group test	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader-mediator		
Students	1 $C_{2,6}$	1 $C_{2,6}$	average	variance	a_{wg}	2 $C_{2,6}$	2 $C_{2,6}$	average	variance	a_{wg}	3 $C_{2,6}$	3 $C_{2,6}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	4,00	5,00	4,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 6	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 7	3,00	3,00	3,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 8	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	4,00	5,00	4,50	0,50	0,71	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 10	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
item 11	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 12	5,00	4,00	4,50	0,50	0,71	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
Average scores	2,92	3,00			0,93	2,17	1,83			0,94	1,08	1,00			0,98
Mutuality	2,96					2,00					1,04				

Appendix C.3: Questionnaires data

Appendix C.3.1: Questionnaires full data - Class A_2

Initial attitude questionnaire class A_2

class A_2	1	2	3	4	5	6	7	8	9	totals	totals by groups
student 1 $A_{2,1}$	2	4	4	2	2	3	2	1	4	**2,67**	
student 2 $A_{2,1}$	3	4	3	1	3	3	2	2	2	**2,56**	
student 3 $A_{2,1}$	2	4	3	2	2	4	2	2	3	**2,67**	
student 4 $A_{2,1}$	2	4	3	2	2	3	1	3	4	**2,67**	**2,64**
student 1 $A_{2,2}$	-	-	-	-	-	-	-	-	-	**-**	
student 2 $A_{2,2}$	3	2	3	2	4	3	2	3	4	**2,89**	
student 3 $A_{2,2}$	2	4	4	3	2	3	3	4	4	**3,22**	
student 4 $A_{2,2}$	3	4	4	3	2	3	3	4	4	**3,33**	**3,15**
student 1 $A_{2,3}$	3	3	4	3	3	3	3	4	4	**3,33**	
student 2 $A_{2,3}$	3	3	4	4	4	4	2	4	4	**3,56**	
student 3 $A_{2,3}$	-	-	-	-	-	-	-	-	-	**-**	
student 4 $A_{2,3}$	2	3	3	2	3	3	1	2	2	**2,33**	**3,07**
student 1 $A_{2,4}$	2	3	3	1	3	3	2	3	2	**2,44**	
student 2 $A_{2,4}$	2	4	4	3	3	3	2	3	3	**3,00**	
student 3 $A_{2,4}$	3	2	4	2	2	4	1	1	4	**2,56**	
student 4 $A_{2,4}$	3	2	3	3	2	3	1	3	3	**2,56**	**2,64**
student 1 $A_{2,5}$	2	3	4	2	3	3	3	4	4	**3,11**	
student 2 $A_{2,5}$	4	3	3	3	4	3	2	4	3	**3,22**	
student 3 $A_{2,5}$	3	4	4	4	3	3	3	4	4	**3,56**	
student 4 $A_{2,5}$	3	4	4	4	4	4	3	4	4	**3,78**	**3,42**
totals by question	**2,61**	**3,33**	**3,56**	**2,56**	**2,83**	**3,22**	**2,11**	**3,06**	**3,44**	**2,97**	

Final attitude questionnaire class A_2

class A_2	1	2	3	4	5	6	7	8	9	totals	totals by groups
student 1 $A_{2,1}$	2	4	3	1	1	3	1	1	2	**2,00**	
student 2 $A_{2,1}$	2	4	3	2	3	3	3	2	2	**2,67**	
student 3 $A_{2,1}$	3	4	4	2	2	3	2	4	4	**3,11**	
student 4 $A_{2,1}$	2	4	3	2	2	4	2	4	4	**3,00**	**2,69**
student 1 $A_{2,2}$	3	3	4	2	3	4	3	2	4	**3,11**	
student 2 $A_{2,2}$	2	3	4	3	4	4	2	3	4	**3,22**	
student 3 $A_{2,2}$	4	4	4	3	3	3	3	3	4	**3,44**	
student 4 $A_{2,2}$	3	3	4	3	3	3	2	4	4	**3,22**	**3,25**
student 1 $A_{2,3}$	3	4	4	3	2	3	3	4	4	**3,33**	
student 2 $A_{2,3}$	-	-	-	-	-	-	-	-	-	**-**	
student 3 $A_{2,3}$	1	2	3	1	2	3	1	2	1	**1,78**	
student 4 $A_{2,3}$	3	3	4	2	2	2	2	2	3	**2,56**	**2,56**
student 1 $A_{2,4}$	2	3	2	1	2	2	2	4	1	**2,11**	
student 2 $A_{2,4}$	-	-	-	-	-	-	-	-	-	**-**	
student 3 $A_{2,4}$	3	3	2	3	3	1	4	2	4	**2,78**	
student 4 $A_{2,4}$	3	3	3	3	4	4	2	3	4	**3,22**	**2,70**
student 1 $A_{2,5}$	3	4	4	3	4	2	2	4	4	**3,33**	
student 2 $A_{2,5}$	4	3	3	3	3	3	3	4	3	**3,22**	
student 3 $A_{2,5}$	3	4	4	4	4	4	3	4	4	**3,78**	
student 4 $A_{2,5}$	3	4	4	4	3	4	4	4	4	**3,78**	**3,53**
totals by question	**2,72**	**3,44**	**3,44**	**2,50**	**2,78**	**3,06**	**2,44**	**3,11**	**3,33**	**2,98**	

Initial – final questionnaires comparison class A_2

students	totals	totals by group	totals	totals by group	initial – final differences	initial – final differences by group
student 1 $A_{2,1}$	2,67		2,00		**-0,67**	
student 2 $A_{2,1}$	2,56		2,67		**0,11**	
student 3 $A_{2,1}$	2,67		3,11		**0,44**	
student 4 $A_{2,1}$	2,67	2,64	3,00	2,69	**0,33**	**0,06**
student 1 $A_{2,2}$	-		3,11		**-**	
student 2 $A_{2,2}$	2,89		3,22		**0,33**	
student 3 $A_{2,2}$	3,22		3,44		**0,22**	
student 4 $A_{2,2}$	3,33	3,15	3,22	3,30	**-0,11**	**0,15**
student 1 $A_{2,3}$	3,33		3,33		**0,00**	
student 2 $A_{2,3}$	3,56		-		**-**	
student 3 $A_{2,3}$	-		1,78		**-**	
student 4 $A_{2,3}$	2,33	2,83	2,56	2,94	**0,22**	**0,11**
student 1 $A_{2,4}$	2,44		2,11		**-0,33**	
student 2 $A_{2,4}$	3,00		-		**-**	
student 3 $A_{2,4}$	2,56		2,78		**0,22**	
student 4 $A_{2,4}$	2,56	2,52	3,22	2,70	**0,67**	**0,19**
student 1 $A_{2,5}$	3,11		3,33		**0,22**	
student 2 $A_{2,5}$	3,22		3,22		**0,00**	
student 3 $A_{2,5}$	3,56		3,78		**0,22**	
student 4 $A_{2,5}$	3,78	3,42	3,78	3,53	**0,00**	**0,11**
totals by question	**2,93**		**3,05**		**0,12**	

Appendix C.3.2: Questionnaires full data - Class B_1

Initial attitude questionnaire class B_1

class B_1	1	2	3	4	5	6	7	8	9	totals	totals by groups
student 1 $B_{1,1}$	1	4	3	1	3	2	2	1	2	**2,11**	
student 2 $B_{1,1}$	3	4	3	2	2	3	1	2	1	**2,33**	
student 3 $B_{1,1}$	2	4	1	1	3	3	1	2	4	**2,33**	
student 4 $B_{1,1}$	2	4	3	1	3	3	1	1	2	**2,22**	**2,25**
student 1 $B_{1,2}$	2	4	2	1	1	3	2	1	1	**1,89**	
student 2 $B_{1,2}$	1	3	2	1	2	2	1	1	1	**1,56**	
student 3 $B_{1,2}$	4	4	4	4	3	4	3	4	4	**3,78**	
student 4 $B_{1,2}$	3	4	3	3	4	4	3	4	4	**3,56**	**2,69**
student 1 $B_{1,3}$	2	4	4	1	3	3	1	2	2	**2,44**	
student 2 $B_{1,3}$	1	3	1	1	3	2	1	1	2	**1,67**	
student 3 $B_{1,3}$	1	2	2	1	2	3	1	1	1	**1,56**	
student 4 $B_{1,3}$	2	4	3	2	3	4	2	4	4	**3,11**	**2,19**
student 1 $B_{1,4}$	2	1	2	1	2	1	1	2	2	**1,56**	
student 2 $B_{1,4}$	2	4	2	1	3	3	2	1	2	**2,22**	
student 3 $B_{1,4}$	3	4	2	1	3	3	1	2	1	**2,22**	
student 4 $B_{1,4}$	4	3	4	1	2	4	1	2	4	**2,78**	**2,19**
student 1 $B_{1,5}$	3	4	2	3	4	4	2	3	3	**3,11**	
student 2 $B_{1,5}$	1	3	1	1	4	4	1	3	1	**2,11**	
student 3 $B_{1,5}$	2	3	3	2	4	4	2	3	3	**2,89**	
student 4 $B_{1,5}$	2	4	4	1	4	4	1	4	2	**2,89**	**2,75**
student 1 $B_{1,6}$	1	4	2	1	3	4	2	3	2	**2,44**	
student 2 $B_{1,6}$	1	3	2	1	3	3	1	1	1	**1,78**	
student 3 $B_{1,6}$	2	4	2	1	2	3	1	2	4	**2,33**	
student 4 $B_{1,6}$	1	1	3	1	3	3	1	2	1	**1,78**	**2,08**
totals by question	**2,00**	**3,42**	**2,50**	**1,42**	**2,88**	**3,17**	**1,46**	**2,17**	**2,25**	**2,36**	

Final attitude questionnaire class B_1

class B_1	1	2	3	4	5	6	7	8	9	totals	totals by groups
student 1 $B_{1,1}$	2	4	2	1	2	4	4	1	1	2,33	
student 2 $B_{1,1}$	1	2	3	4	4	4	2	2	1	2,56	
student 3 $B_{1,1}$	3	3	4	1	3	3	3	3	2	2,78	
student 4 $B_{1,1}$	2	4	2	1	4	3	3	1	2	2,44	**2,53**
student 1 $B_{1,2}$	2	3	2	1	3	3	2	2	1	2,11	
student 2 $B_{1,2}$	2	3	3	1	1	2	1	2	2	1,89	
student 3 $B_{1,2}$	4	4	4	3	2	3	2	3	4	3,22	
student 4 $B_{1,2}$	3	4	3	3	4	4	4	4	4	3,67	**2,72**
student 1 $B_{1,3}$	2	4	4	1	2	2	2	2	2	2,33	
student 2 $B_{1,3}$	2	1	3	2	3	3	2	4	4	2,67	
student 3 $B_{1,3}$	2	2	2	1	1	3	1	1	1	1,56	
student 4 $B_{1,3}$	3	4	2	3	4	4	3	4	4	3,44	**2,50**
student 1 $B_{1,4}$	2	3	3	1	2	3	2	3	2	2,33	
student 2 $B_{1,4}$	2	4	2	1	3	4	4	1	1	2,44	
student 3 $B_{1,4}$	2	3	2	1	2	3	1	2	1	1,89	
student 4 $B_{1,4}$	3	4	3	1	2	3	1	2	2	2,33	**2,25**
student 1 $B_{1,5}$	4	4	3	3	4	3	4	3	2	3,33	
student 2 $B_{1,5}$	2	4	4	1	2	3	2	1	1	2,22	
student 3 $B_{1,5}$	4	4	4	3	1	4	3	3	4	3,33	
student 4 $B_{1,5}$	4	4	4	1	3	3	2	4	3	3,11	**3,00**
student 1 $B_{1,6}$	2	4	3	2	4	4	1	4	2	2,89	
student 2 $B_{1,6}$	2	4	2	1	2	2	1	1	1	1,78	
student 3 $B_{1,6}$	2	4	2	1	3	3	2	1	4	2,44	
student 4 $B_{1,6}$	2	4	2	1	4	3	1	2	2	2,33	**2,36**
totals by question	**2,46**	**3,50**	**2,83**	**1,63**	**2,71**	**3,17**	**2,21**	**2,33**	**2,21**	**2,56**	

Initial – final questionnaires comparison class B_1

students	totals	totals by group	totals	totals by group	initial – final differences	initial – final differences by group
student 1 $B_{1,1}$	2,11		2,33		**0,22**	
student 2 $B_{1,1}$	2,33		2,56		**0,22**	
student 3 $B_{1,1}$	2,33		2,78		**0,44**	
student 4 $B_{1,1}$	2,22	2,25	2,44	2,53	**0,22**	**0,28**
student 1 $B_{1,2}$	1,89		2,11		**0,22**	
student 2 $B_{1,2}$	1,56		1,89		**0,33**	
student 3 $B_{1,2}$	3,78		3,22		**-0,56**	
student 4 $B_{1,2}$	3,56	2,69	3,67	2,72	**0,11**	**0,03**
student 1 $B_{1,3}$	2,44		2,33		**-0,11**	
student 2 $B_{1,3}$	1,67		2,67		**1,00**	
student 3 $B_{1,3}$	1,56		1,56		**0,00**	
student 4 $B_{1,3}$	3,11	2,19	3,44	2,50	**0,33**	**0,31**
student 1 $B_{1,4}$	1,56		2,33		**0,78**	
student 2 $B_{1,4}$	2,22		2,44		**0,22**	
student 3 $B_{1,4}$	2,22		1,89		**-0,33**	
student 4 $B_{1,4}$	2,78	2,19	2,33	2,25	**-0,44**	**0,06**
student 1 $B_{1,5}$	3,11		3,33		**0,22**	
student 2 $B_{1,5}$	2,11		2,22		**0,11**	
student 3 $B_{1,5}$	2,89		3,33		**0,44**	
student 4 $B_{1,5}$	2,89	2,75	3,11	3,00	**0,22**	**0,25**
student 1 $B_{1,6}$	2,44		2,89		**0,44**	
student 2 $B_{1,6}$	1,78		1,78		**0,00**	
student 3 $B_{1,6}$	2,33		2,44		**0,11**	
student 4 $B_{1,6}$	1,78	2,08	2,33	2,36	**0,56**	**0,28**
totals by question	**2,36**		**2,56**		**0,20**	

Appendix C.3.3: Questionnaires full data - Class C_2

Initial attitude questionnaire class C_2

class C_2	1	2	3	4	5	6	7	8	9	totals	totals by groups
student 1 $C_{2,1}$	2	4	4	2	3	4	3	3	2	**3,00**	
student 2 $C_{2,1}$	1	4	3	2	3	3	2	4	2	**2,67**	
student 3 $C_{2,1}$	4	4	4	2	4	4	3	4	4	**3,67**	**3,11**
student 1 $C_{2,2}$	4	4	3	3	4	4	3	4	4	**3,67**	
student 2 $C_{2,2}$	2	3	4	1	3	3	1	2	2	**2,33**	
student 3 $C_{2,2}$	3	3	2	1	2	3	1	3	4	**2,44**	
student 4 $C_{2,2}$	3	4	4	3	4	4	3	4	4	**3,67**	**3,03**
student 1 $C_{2,3}$	1	2	1	1	2	2	1	1	4	**1,67**	
student 2 $C_{2,3}$	1	3	3	1	2	2	2	1	2	**1,89**	
student 3 $C_{2,3}$	1	3	2	1	3	2	2	2	2	**2,00**	**1,85**
student 1 $C_{2,4}$	1	1	1	1	1	1	1	1	2	**1,11**	
student 2 $C_{2,4}$	1	3	1	1	2	2	1	1	1	**1,44**	
student 3 $C_{2,4}$	2	4	3	3	4	4	2	4	3	**3,22**	
student 4 $C_{2,4}$	2	4	2	2	3	3	2	2	4	**2,67**	**2,11**
student 1 $C_{2,5}$	3	4	3	3	4	4	3	4	4	**3,56**	
student 2 $C_{2,5}$	2	2	3	1	3	4	2	3	3	**2,56**	
student 3 $C_{2,5}$	4	3	3	3	4	4	3	3	3	**3,33**	
student 4 $C_{2,5}$	2	4	3	3	2	3	2	4	2	**2,78**	**3,06**
student 1 $C_{2,6}$	2	4	4	4	4	4	2	2	4	**3,33**	
student 2 $C_{2,6}$	3	2	1	1	2	2	1	3	1	**1,78**	
student 3 $C_{2,6}$	4	4	4	4	4	4	4	4	4	**4,00**	**3,04**
totals by question	**2,29**	**3,29**	**2,76**	**2,05**	**3,00**	**3,14**	**2,10**	**2,81**	**2,90**	**2,70**	

Final attitude questionnaire class C_2

class C_2	1	2	3	4	5	6	7	8	9	totals	totals by groups
student 1 $C_{2,1}$	1	4	4	2	3	3	3	3	1	**2,67**	
student 2 $C_{2,1}$	4	4	3	2	4	3	3	4	2	**3,22**	
student 3 $C_{2,1}$	4	4	2	2	4	4	3	3	4	**3,33**	**3,07**
student 1 $C_{2,2}$	4	4	4	2	2	4	4	3	2	**3,22**	
student 2 $C_{2,2}$	2	4	4	2	4	3	3	3	3	**3,11**	
student 3 $C_{2,2}$	4	4	3	2	2	3	3	3	4	**3,11**	
student 4 $C_{2,2}$	4	4	4	3	4	4	4	4	4	**3,89**	**3,33**
student 1 $C_{2,3}$	3	3	2	1	2	2	1	2	2	**2,00**	
student 2 $C_{2,3}$	3	4	4	2	2	2	-	1	2	**2,50**	
student 3 $C_{2,3}$	2	3	4	1	4	3	2	2	4	**2,78**	**2,43**
student 1 $C_{2,4}$	2	1	3	1	2	2	1	3	4	**2,11**	
student 2 $C_{2,4}$	1	1	2	1	2	3	1	2	2	**1,67**	
student 3 $C_{2,4}$	3	4	4	3	4	4	4	4	4	**3,78**	
student 4 $C_{2,4}$	2	3	2	1	4	2	-	3	4	**2,63**	**2,55**
student 1 $C_{2,5}$	3	4	4	3	4	4	2	4	2	**3,33**	
student 2 $C_{2,5}$	3	3	3	1	3	3	2	3	3	**2,67**	
student 3 $C_{2,5}$	3	3	3	2	3	3	3	3	4	**3,00**	
studentt 4 $C_{2,5}$	3	4	4	2	3	2	1	3	4	**2,89**	**2,97**
student 1 $C_{2,6}$	4	4	4	3	4	4	1	2	4	**3,33**	
student 2 $C_{2,6}$	3	3	4	1	3	1	3	3	2	**2,56**	
student 3 $C_{2,6}$	4	4	4	4	4	4	4	4	4	**4,00**	**3,30**
totals by question	**2,95**	**3,43**	**3,38**	**1,95**	**3,19**	**3,00**	**2,53**	**2,95**	**3,10**	**2,94**	

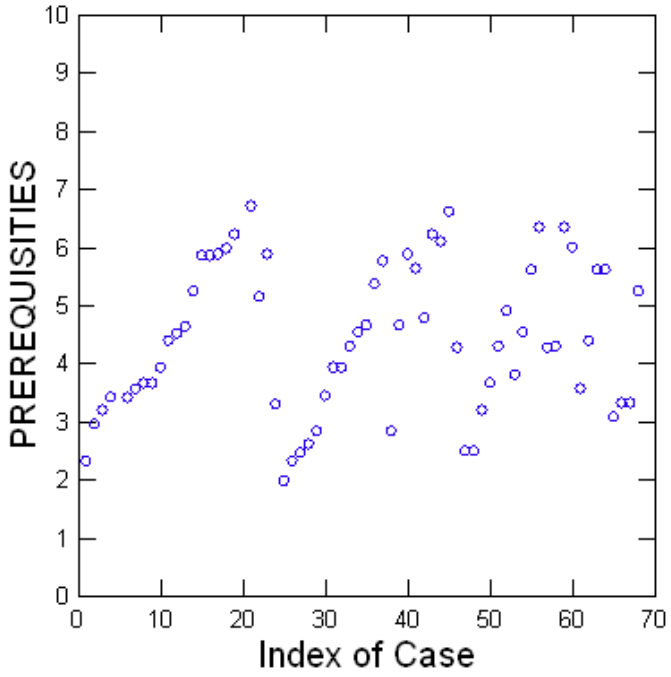
Initial – final questionnaires comparison class C_2

students	totals	totals by group	totals	totals by group	initial – final differences	initial – final differences by group
student 1 $C_{2,1}$	3,00		2,67		**-0,33**	
student 2 $C_{2,1}$	2,67		3,22		**0,56**	
student 3 $C_{2,1}$	3,67	3,11	3,33	3,07	**-0,33**	**-0,04**
student 1 $C_{2,2}$	3,67		3,22		**-0,44**	
student 2 $C_{2,2}$	2,33		3,11		**0,78**	
student 3 $C_{2,2}$	2,44		3,11		**0,67**	
student 4 $C_{2,2}$	3,67	3,03	3,89	3,33	**0,22**	**0,31**
student 1 $C_{2,3}$	1,67		2,00		**0,33**	
student 2 $C_{2,3}$	1,89		2,50		**0,61**	
student 3 $C_{2,3}$	2,00	1,85	2,78	2,43	**0,78**	**0,57**
student 1 $C_{2,4}$	1,11		2,11		**1,00**	
student 2 $C_{2,4}$	1,44		1,67		**0,22**	
student 3 $C_{2,4}$	3,22		3,78		**0,56**	
student 4 $C_{2,4}$	2,67	2,11	2,63	2,55	**-0,04**	**0,43**
student 1 $C_{2,5}$	3,56		3,33		**-0,22**	
student 2 $C_{2,5}$	2,56		2,67		**0,11**	
student 3 $C_{2,5}$	3,33		3,00		**-0,33**	
student 4 $C_{2,5}$	2,78	3,06	2,89	2,97	**0,11**	**-0,08**
student 1 $C_{2,6}$	3,33		3,33		**0,00**	
student 2 $C_{2,6}$	1,78		2,56		**0,78**	
student 3 $C_{2,6}$	4,00	3,04	4,00	3,30	**0,00**	**0,26**
totals by question	**2,70**		**2,94**		**0,24**	

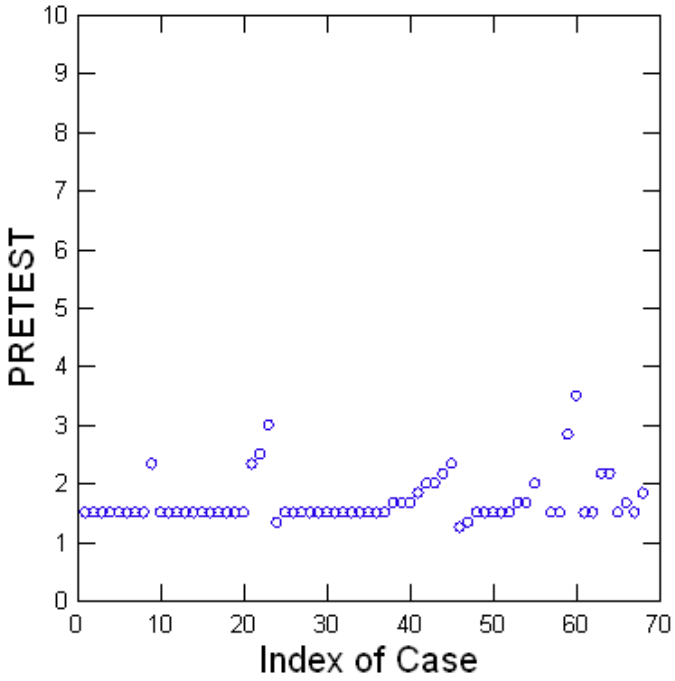
APPENDIX D
Quadratic functions unit

Appendix D.1: Didactic material

Appendix D.1.1: Students' prerequisites test results graph on quadratic functions



Appendix D.1.1: Students' pre-test results graph on quadratic functions



Appendix D.1.3: Quadratic functions prerequisites test

Name: _____ Surname: _____

School: _____ Class: _____

1) Which is the greatest among these numbers? Circle the correct answer.

0.5 0.490 0.499 0.059

2) Which is the greatest fraction among these? Circle the correct answer.

$\frac{3}{4}$ $\frac{4}{3}$ $\frac{11}{12}$ $\frac{5}{3}$

3) What equals $-2+3-(-5-7)$?

_____

4) Since *a* is negative number, which of the following expressions represents a positive number? Circle the correct answer.

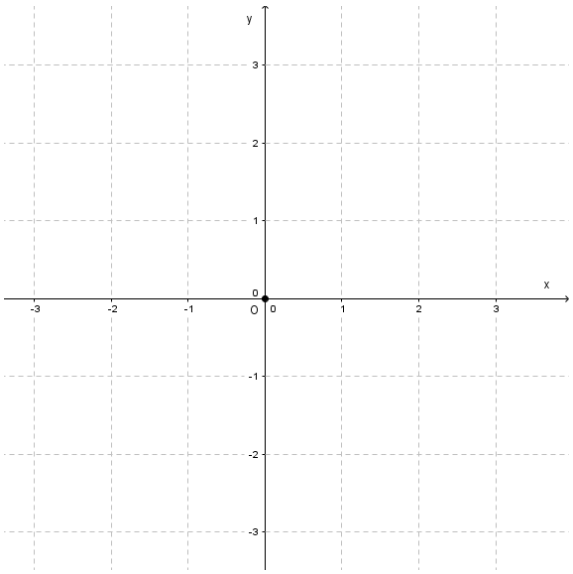
$(-a)^2$ $-(a)^2$ $(-a^2)$ $-(a^2)$

5) A wooden board is divided into two parts, with one being the half of the other. Which fraction of the whole board corresponds to the smallest part?

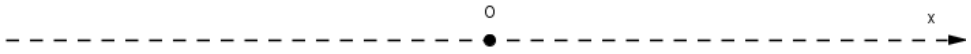
_____

6) Find the following couples of points (x, y) on the Cartesian plane:

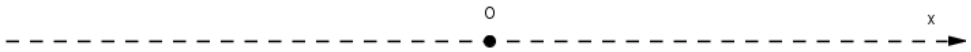
A $(-3;\ 3)$ B $(-1;\ 0)$ C $(0;\ 0{,}5)$ D $(0{,}5;\ -\frac{3}{2})$ E $(3;\ -1)$



7) On the numeric line below, mark with a continuous stroke all real numbers x such that **x ≥ 1**:



8) On the numeric line below, mark with a continuous stroke all real numbers x such that $-\frac{5}{3} \leq x < 2$:



9) Solve the equations and inequalities below showing every step of the resolution process and comment the final result:

$$12\,(x-3)+8x=10\,(2x+5)$$

$$(x+2)(x-2)-3x<x^2-x+2$$

$$2x+(x-1)^2>x^2$$

10) What is a function? Write the definition and try to write an example.

11) In December 2012, two phone companies proposed the following offers for mobile phones contracts[121]:

	Minuti settimanali gratuiti di telefonate verso fissi o mobili inclusi nel costo fisso	Costo fisso (€)	Costo al minuto per i minuti di telefonate oltre quelli gratuiti (€/min)
Compagnia B	200	12.86	0.16
Compagnia C	100	17.14	0.10

Complete the table below:

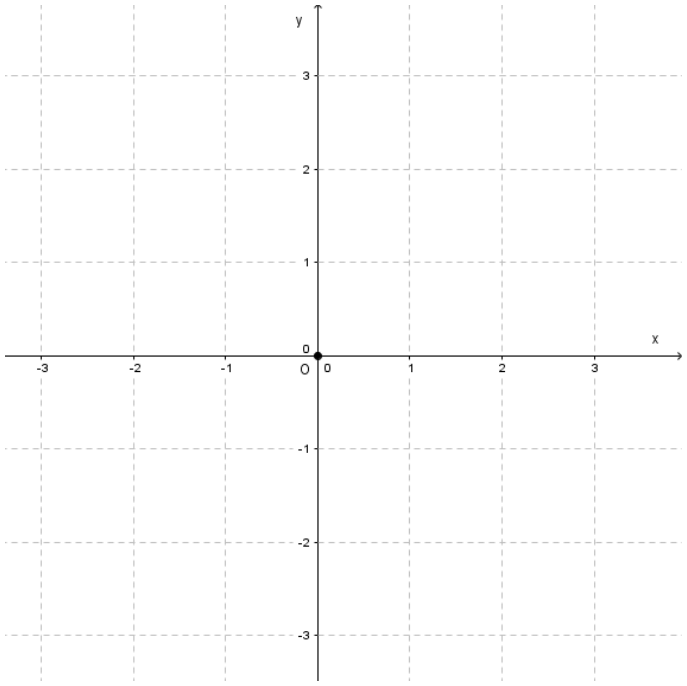
Used weekly minutes	**0**	**100**	**200**	**300**
Cost with Company B	12.86	12.86		
Cost with Company C	17.14	17.14		

[121] "Compagnia B" means "Company B", "Compagnia C" means "Company C".
Column 1 means: Free weekly minutes for calls to landlines or mobiles included in the fixed cost.
Column 2 means: Fixed cost (€).
Column 3 means: Cost per minute for minutes exceeding the free min. (€/min).

12a) Given the function $f(x) = x - 1$, complete the following equalities:

- $f(2) = \_\_$
- $f(-3) = \_\_$
- $f(\_\_) = 6$
- $f(\_\_) = -\frac{1}{2}$

12b) Draw the function $f(x) = x - 1$ on the Cartesian plane. What do you get graphically?



_____

12c) Explain the meaning of solving the equation: $x - 1 = 0$ graphically.

_____
_____
_____

12d) What are the "zeros of a function"? Answer the question and calculate the zeros of the function $f(x) = x - 1$.

_____
_____
_____

12e) What is the "study of the sign of a function"? Answer the question and study the sign of the function $f(x) = x - 1$.

_____
_____
_____

Appendix D.1.4: Quadratic functions pre-test

Name: _____ Surname: _____

School: _____ Class: _____

1a) Given a generic quadratic function $f(x) = ax^2 + bx + c$, what does its graph represent on the Cartesian plane?

_____

1b) What is the meaning of the coefficients *a*, *b* and *c* on the graph?

Coeff. *a*: _____

Coeff. *b*: _____

Coeff. *c*: _____

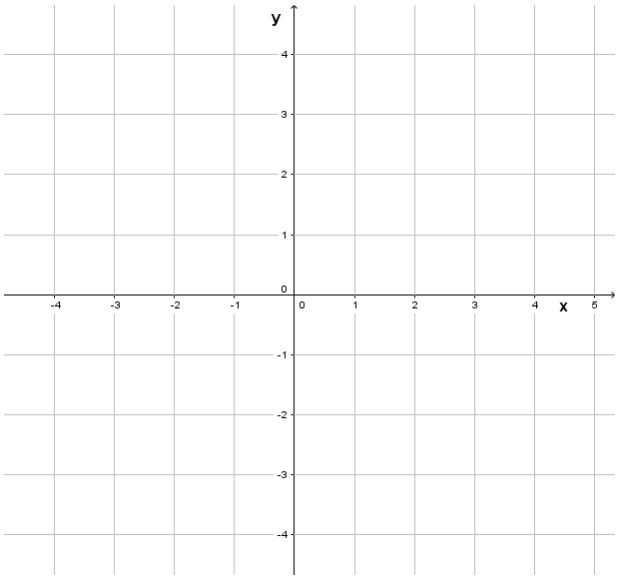
1c) What are and how can you calculate the vertex and the axis of symmetry of a parabola?

_____

_____

_____

2) Draw the graph of the quadratic function $f(x) = x^2 + 2x - 3$ and locate the coordinates of the points of intersection of the graph with the *x*-axis and the *y*-axis.



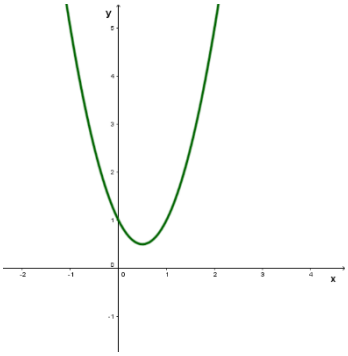
3) Solve the equation: $-2x^2 + x + 1 = 0$, showing all the steps of the resolution process:

_____

_____

_____

4) Looking only at the graph of the quadratic function: $f(x) = 2x^2 + 2x + 1$, complete the table by working out for which values of x the equations and inequalities next to it are verified (you can highlight the respective solution intervals on the same graph)

graph of $f(x) = 2x^2 + 2x + 1$	inequalities	solutions
	$2x^2 + 2x + 1 = 0$	_____
	$2x^2 + 2x + 1 > 0$	_____
	$2x^2 + 2x + 1 < 0$	_____

5) Solve the following inequalities showing each step of the resolution process:

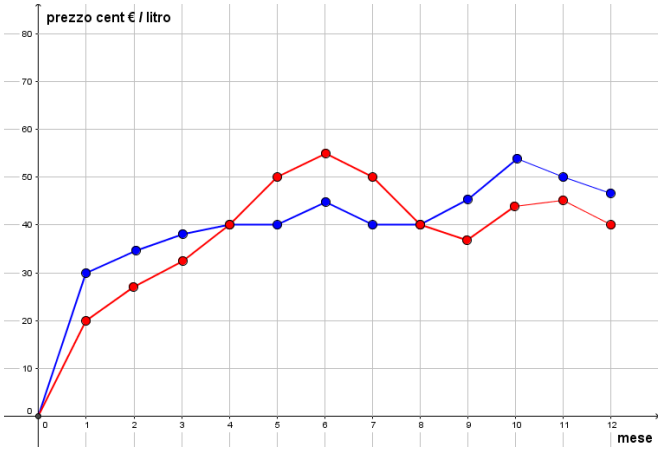
a) $-4x^2 - 8x > 0$

_____
_____
_____

b) $x^2 - 9 \geq 0$

_____
_____
_____

6) These following graphs[122] show the price trend (in cents) of a liter of water sold by the "blue" and the "red" businesses in 12 months.



Answer to the questions below:

- Mark the points of intersection between the two graphs on the graph above.
- In which months did the two brands have the same price?

  _____
- In which months was the blue brand more expensive than the red one?

  _____
- In which months was the red brand more expensive than the blue one instead?

  _____

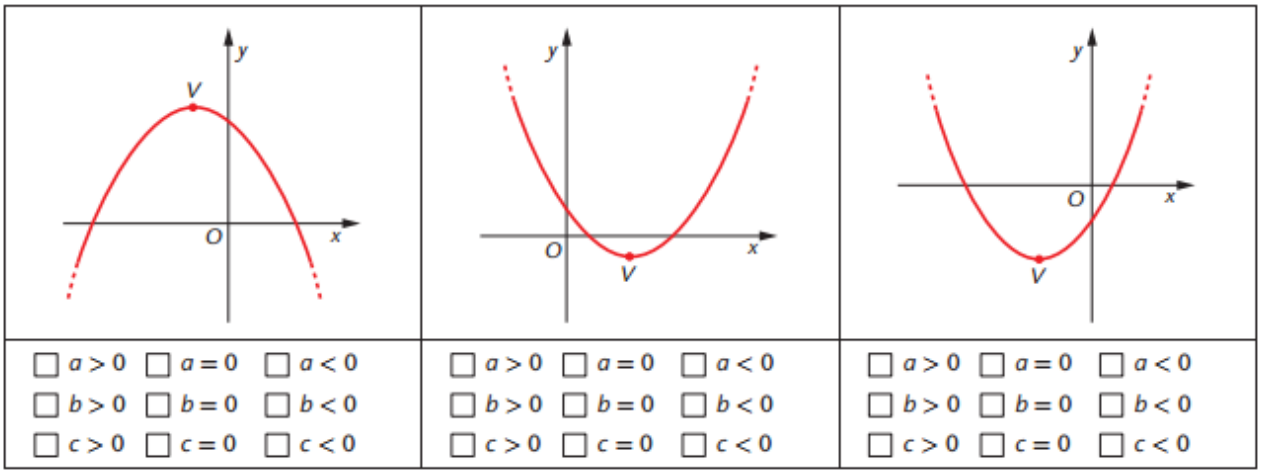
[122] "Prezzo cent € / litro" means "Price € / liter". "Mese" means "month".

Appendix D.1.5: Quadratic functions final test

Name: _____ Surname: _____

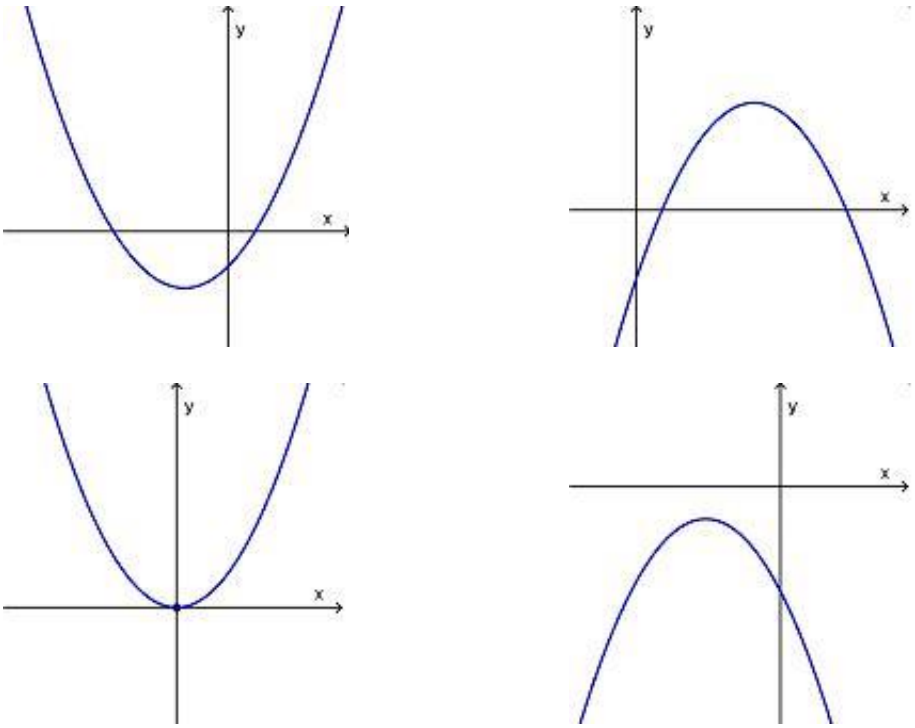
School: _____ Class: _____

1) For each of the following parabolas, tick the correct box relatively to the coefficients *a*, *b* and *c* of the function $f(x) = a \cdot x^2 + b \cdot x + c$.



☐ $a>0$ ☐ $a=0$ ☐ $a<0$ ☐ $b>0$ ☐ $b=0$ ☐ $b<0$ ☐ $c>0$ ☐ $c=0$ ☐ $c<0$	☐ $a>0$ ☐ $a=0$ ☐ $a<0$ ☐ $b>0$ ☐ $b=0$ ☐ $b<0$ ☐ $c>0$ ☐ $c=0$ ☐ $c<0$	☐ $a>0$ ☐ $a=0$ ☐ $a<0$ ☐ $b>0$ ☐ $b=0$ ☐ $b<0$ ☐ $c>0$ ☐ $c=0$ ☐ $c<0$

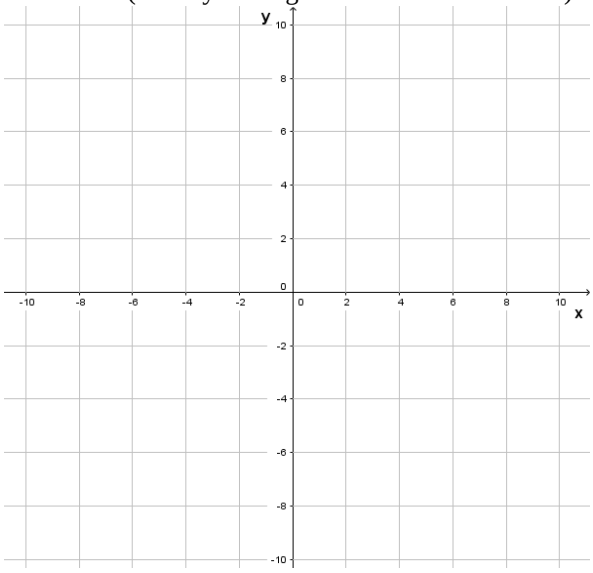
2) Match each parabola to the equations a, b, c, d:



a: $f(x) = -x^2 - 3x - 4$; **b**: $f(x) = 2x^2 + 3x - 1$; **c**: $f(x) = -x^2 + 4x - 3$; **d**: $f(x) = 2x^2$

3) Draw the graph of the quadratic function $\boldsymbol{f(x) = -2x^2 + 8x - 6}$ and define <u>both graphically and algebraically:</u>

- the coordinates of the vertex V(x_v, y_v);
- the equation of the axis of symmetry;
- the coordinates of the point of intersection with the y-axis;
- the coordinates of the points of intersection with the *x*-axis (start by finding the zeros of the function).

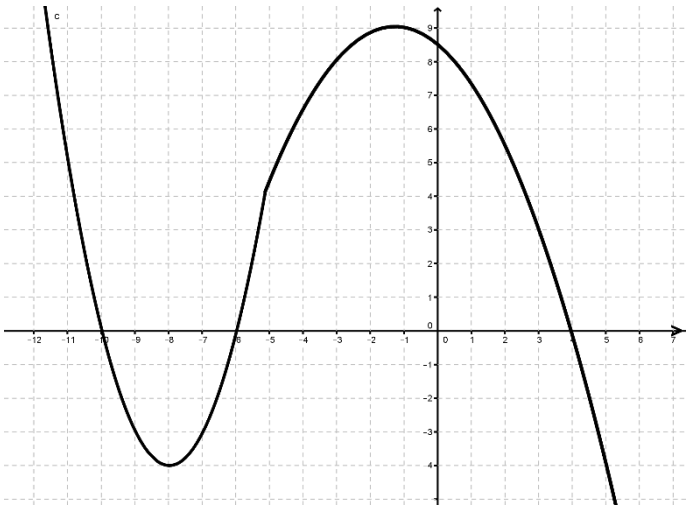


_____

4) Solve the equation: $2x^2 + x - 1 = 0$, showing each step of the resolution process and commenting the final result:

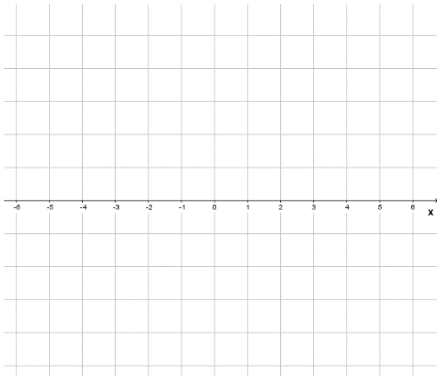
_____
_____
_____

5) Looking <u>only at the graph</u> of the function $f(x)$, complete the table by working out for which values of *x* the equations and inequalities next to it are verified (you can highlight the respective solution intervals on the same graph).

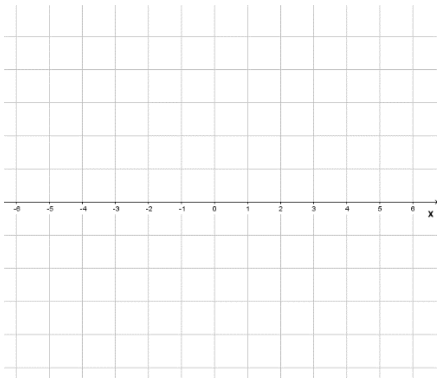
Graph of $y = f(x)$	*equat. and inequal.*	*solutions*
	$f(x) = 0$	_____
	$f(x) > 0$	_____
	$f(x) < 0$	_____

6) Solve the following quadratic inequalities showing each step of the resolution process and commenting the final result:

a) $6x^2 - 8x > 0$



b) $-x^2 - 4 \geq 0$

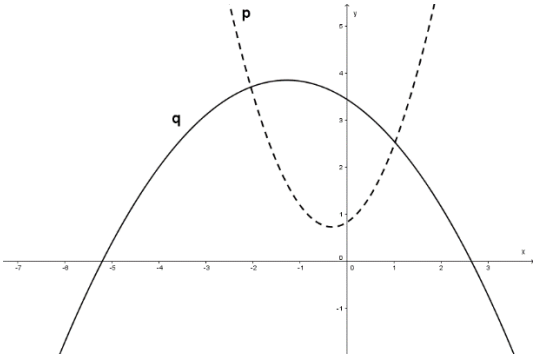


7) Observe the graph below. Try to compare the parabolas *p* and *q* by answering to the following questions:

- Mark the points of intersection between the two parabolas on the graph.
- For which values of *x* do the two parabolas intersect each other?

- For which values of *x* are the corresponding *y* of the points of the parabola *p* greater than those of the parabola *q*?

- For which values of *x* are the corresponding *y* of the points of the parabola *p* smaller than those of the parabola *q* instead?



Appendix D.1.6: Texts of the ten quadratic functions didactic activities

Activity 1: Braking distance!

Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____

Introduction:

Braking distance is the distance a vehicle will cover from the point when its brakes are fully applied to when it stops completely.

If a vehicle is in good conditions and it travels on a dry road, braking distance s can be described through this function: $(v) = \frac{v^2}{200}$, where v is the speed of the vehicle when it starts braking. (**NB**: this relationship is only numerical and it does not take into consideration any units of measurement involved in the game!).

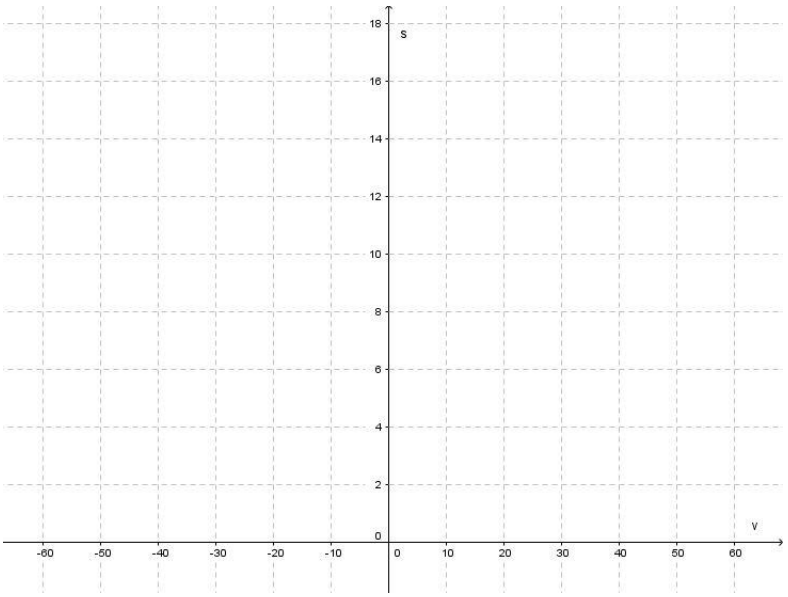
Activities:

1) Complete the following table by calculating the values assumed by the function "braking distance" $s(v) = \frac{v^2}{200}$ *compared to the speed values* v*.*

***NB**: Calculator may be used*

v	***s***
0	0
10	0.5
20	
30	
40	
50	

2) Draw the points of the coordinates (v, s) *that you calculated in exercise 1) on the Cartesian plane below. Try to connect them with a pencil, in order to draw the graph of the relationship between speed* v *(on the x-axis) and the braking distance* s *(on the y-axis).*



3) Now examine a few negative speed values (the vehicle moves backwards). Complete the table and draw the new points of coordinates (v, s) on the previous Cartesian plane. Eventually connect all the points you drew.

v	***s***
0	0
-10	
-20	
-30	
-40	
-50	

4) Which particular details do you see in the scheme of the points you drew? Are there any similarities between the positive speed examples and the negative ones?

_____
_____

5) In which quadrants of the Cartesian plane are the points you identified located? In this case, which sign do their ordinates assume?

_____
_____

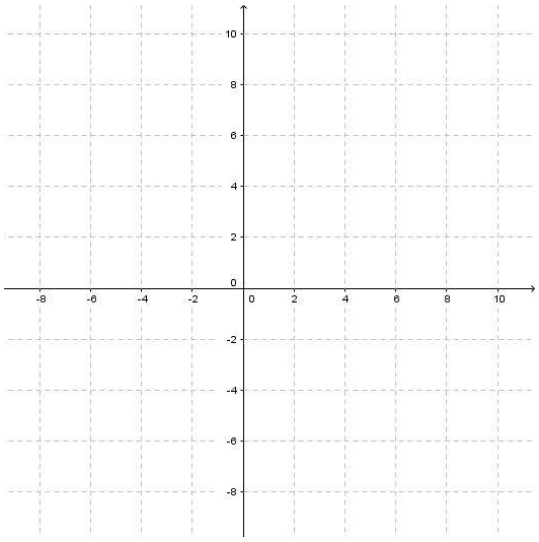
6) Is there a "particular/peculiar" point among the ones you drew? If yes, describe its characteristics:

_____
_____

7) Using your previous observations, what are the main elements that would help you to draw a parabola quicker (even if approximatively)?

_____
_____

8) This is another case that can be described by the quadratic function: $\boldsymbol{f(x) = -2 \cdot x^2}$. Draw its graph in the Cartesian plane below using the table next to it:



$\boldsymbol{x}$	$\boldsymbol{f(x) = -2x^2}$
…	…

Do you see any difference in comparison to the "speed – braking distance" graph that you analyzed before? What changes and what is the element of the equation that causes this change?

_____

Activity 2: Quadratic functions

Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____

Summary:

Starting from a real situation (the braking distance of a car), we will now study a new locus of points that we will call **parabola**. The parabolic model (also called "quadratic") can describe several other phenomena. For this reason we will continue to study it from mathematical point of view only.

Introduction:

So far we have only studied parabola cases which can be described with such functions like $f(x) = a \cdot x^2$ with $a \in \mathbb{R}$. Starting from these cases, we identified the first key elements that allowed us to draw their graphs more easily: the "particular" point called **vertex**, **the axis of symmetry** and the **geometric significance of the coefficient *a*** (if $a > 0$ the parabola is concave up, if $a < 0$ the parabola is concave down).

Usually, all possible parabolas with their axis parallel to the y-axis are described by functions like this:

$$f(x) = a \cdot x^2 + b \cdot x + c \text{ with } a, b, c \in \mathbb{R}$$

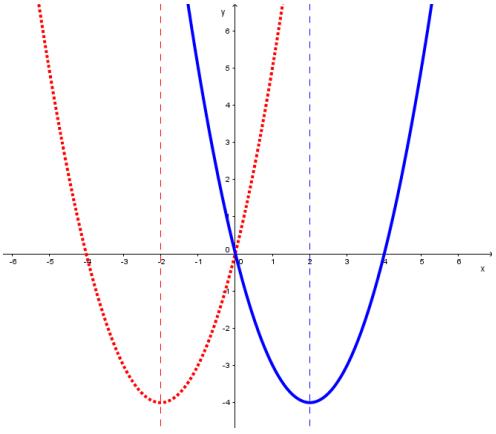
Problem:

What is the meaning of coefficients *b* and *c* graphically? Let's find it out together…

Activities:

1) In the following Cartesian plane we can observe the graphs of the following functions:

$$f(x) = x^2 + 4x;$$
$$g(x) = x^2 - 4x.$$

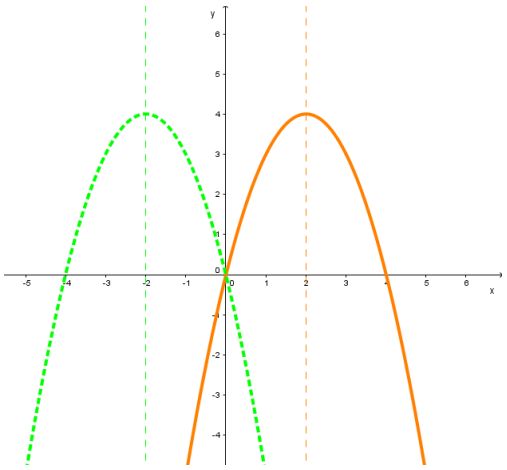


These two functions are different by one coefficient. Which one is it? How can this coefficient influence the position of the axis of symmetry in relation to the y-axis?

_____
_____

2) In the following Cartesian plane we can observe the graphs of the following functions:

$$h(x) = -x^2 - 4x;$$
$$k(x) = -x^2 + 4x.$$



Which coefficient changes between the two functions now? Does it have the same influence as the previous case? Describe the differences you have observed between the two examples.

_____

_____

3) In conclusion, given a generic quadratic function $f(x) = ax^2 + bx$, what is the relationship between the coefficients a and b that defines the position of the axis of symmetry in relation to the y-axis?

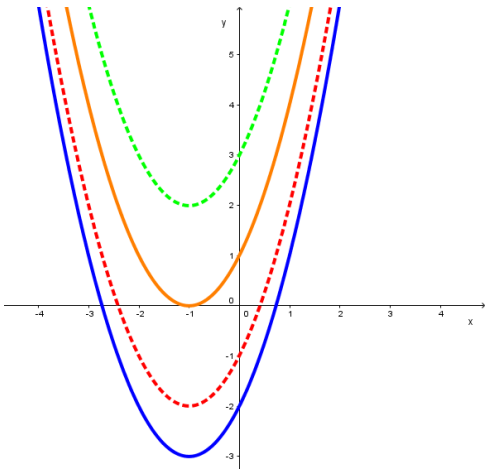
_____

_____

4) In the following Cartesian plane we can observe the graphs of the following functions:

$$f(x) = x^2 + 3x + 3;$$
$$g(x) = x^2 + 3x + 1;$$
$$h(x) = x^2 + 3x - 1;$$
$$k(x) = x^2 + 3x - 2.$$

***NB**: the letters of the functions f, g, h, k are the same as the previous exercises, but the equations are different!*

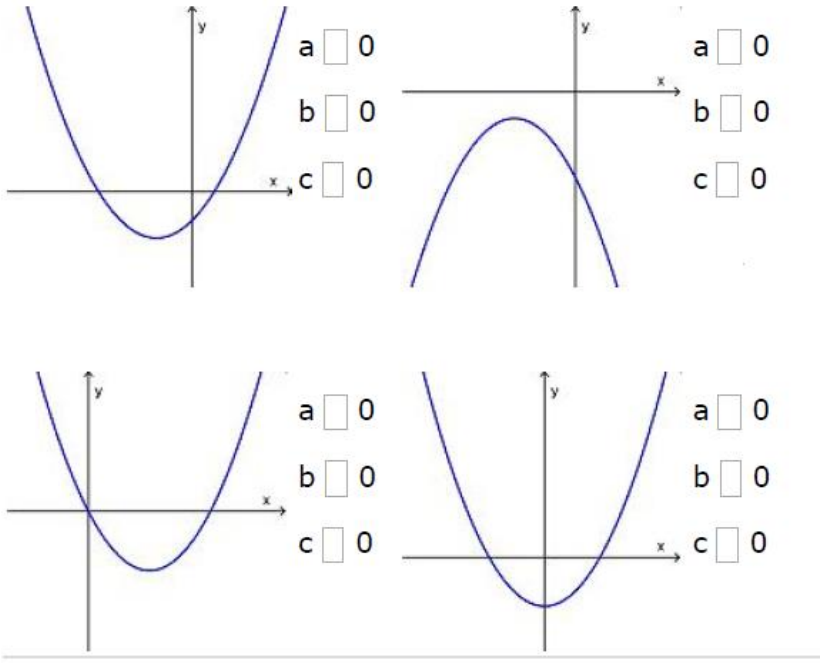


Which coefficient changes among the functions? What and how does this coefficient affect the graph?

_____

_____

5) Enter the right symbol (‘<’ smaller, ‘>’ greater or ‘=’equal) for each parabola below:



Activity 3: Define the vertex and the axis of a parabola

Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____

Summary:

Last time we started studying the quadratic model:

$$f(x) = a \cdot x^2 + b \cdot x + c \text{ with } a, b, c \in \mathbb{R}$$

Throughout the group activities we have done so far, the following points should be clear:

- The importance of the **vertex** (the "particular" point) and of the **axis of symmetry** in the study of a parabola;

- The vertex is the only point of the parabola that belongs to the axis of simmetry. Moreover, depending on the sign of the coefficient *a,* its ordinate *y* will be the biggest (if $a < 0$) or the smallest (if $a > 0$) of all the ordinates of the points belonging to the parabola.
- It is possible to draw the entire graph working only on the development of the curve in one of the two half-planes identified by its axis of symmetry; in fact, once a semi parabola is identified, it is sufficient to invert it symmetrically against the axis on the other half-plane.

- The geometric meaning of the three coefficients ***a, b, c:***

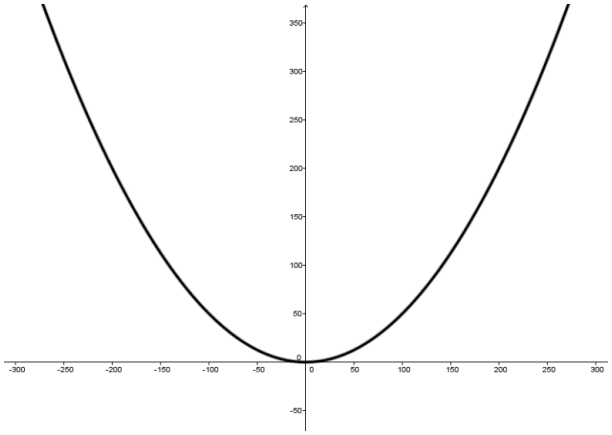
- If $a > 0$, the parabola has its concavity upwards and it is called ***convex parabola***;
  If $a < 0$, the parabola has its concavity downwards and it is called ***concave parabola.***
- If *a* and *b* have the same sign, the vertex and, therefore, the axis of symmetry, are on the left side of the *y*-axis.
  If a and b have opposite signs, the vertex and, therefore, the axis of symmetry, are on the right side of the y-axis.
- The coefficient *c* is the ordinate of the point of intersection of the parabola with the *y*-axis.

Problem:

How can we define precisely the coordinates of both the vertex and the axis of the graph of a generic function $f(x) = a \cdot x^2 + b \cdot x + c$? Let's find it out…

Activities:

1) In the following Cartesian plane the parabola studied in the first lesson on the braking distance is shown: $f(x) = \frac{1}{200}x^2$*, where the speed is now x (instead of v) and the braking distance is now* $y = f(x)$ *(instead of s):*



What are the coordinates of its vertex? What is the equation of its axis of symmetry?

The coordinates of the vertex are $x = \_\_$ *and* $y = \_\_$*, while the equation of the axis of symmetry is* ____ .

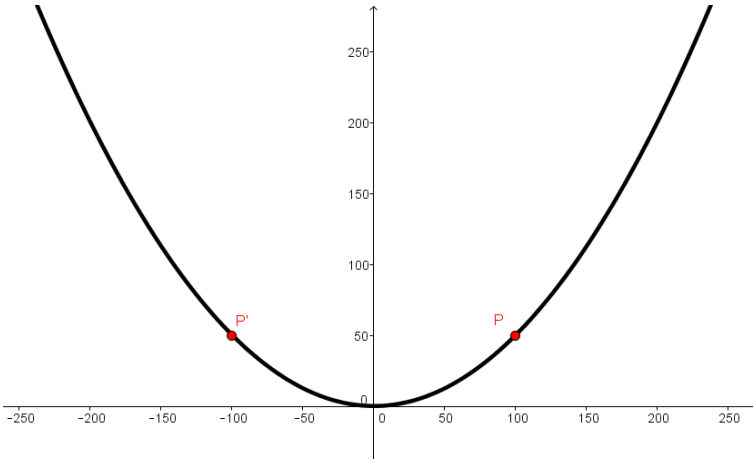
Is there any relationship between the coordinates of the vertex and the equation of the axis of symmetry?

_____

_____

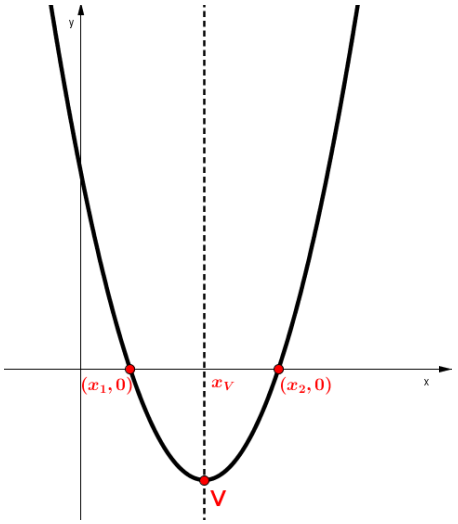
2) If we keep on considering the function $f(x) = \frac{1}{200}x^2$*, at the end of Activity 2 we found the key element "axis of symmetry" that allowed us to say that:*

"if you choose a point of the parabola like, for example, point P with coordinates $(100; 50)$*, then also point P' with coordinates* $(-100; 50)$ *will surely belong to the parabola".*

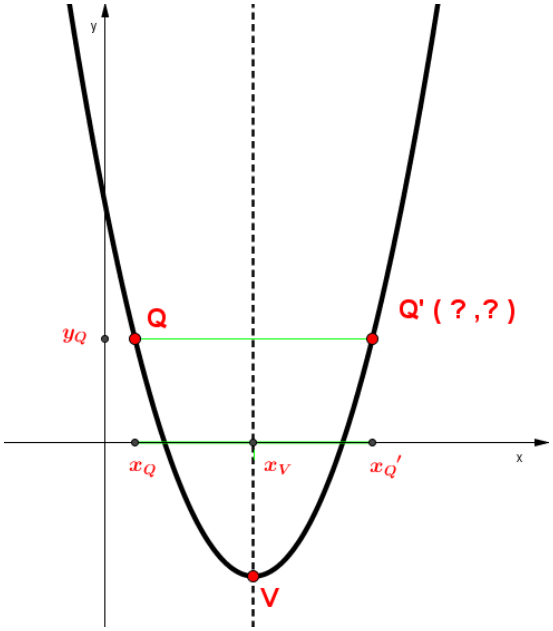


Now let's take another parabolic model whose graph has its axis of symmetry separated from the y-axis, for example $f(x) = \frac{1}{2}x^2 - 5x + 8$ *(see the graph below).*
What successful strategy would you choose to define the abscissa (the first coordinate x) of the vertex V (and the equation of the axis of symmetry of the parabola as a consequence) if we already knew the coordinates of two symmetric points belonging to the parabola?

***Hint**: For instance, suppose you already know the two symmetric points in the graph with coordinates* $(x_1, 0)$ *and* $(x_2, 0)$.



3) If you still consider the parabola described by the function $f(x) = \frac{1}{2}x^2 - 5x + 8$ *and you already knew the coordinates* (x_Q, y_Q) *of a point Q belonging to the parabola and the coordinates* (x_V, y_V) *of the vertex V, how would you define the coordinates* $(x_{Q'}, y_{Q'})$ *of the symmetric Q'?*



Activity 4: The zeros of a quadratic function

Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____

Summary:

Last time we started studying the quadratic model:

$$f(x) = a \cdot x^2 + b \cdot x + c \text{ with } a, b, c \in \mathbb{R}$$

Throughout the group activities we have done so far, the following points should be clear:

- The domain and the range of a quadratic function match the set $\mathbb{R}$ of real numbers.

- A **parabola** is the graph of a quadratic function and we already know how to draw a first draft in the Cartesian plane if we identify:

- The **vertex V**, whose coordinates are: $\left(-\frac{b}{2a}; f(-\frac{b}{2a})\right)$.
- The **axis of symmetry**, whose equation is: $x = x_V = -\frac{b}{2a}$.
- The analysis of the **sign of the coefficient *a***:
  - If $a > 0$, the parabola has its concavity upwards and it is called **convex parabola**;
  - If a < 0, the parabola has its concavity downwards and it is called **concave parabola.**
- The **point of intersection of the parabola with the *y*-axis**, whose coordinates are $(0;\ c)$.

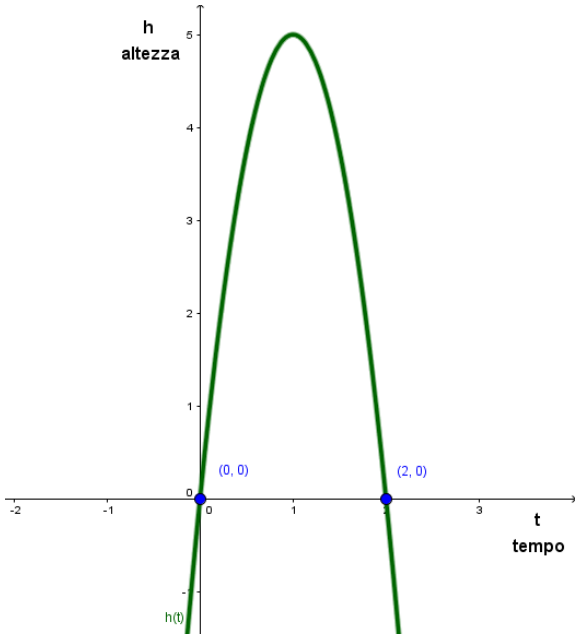
Problem:

How can we find the **zeros of a quadratic function**? Let's find it out…
Generally speaking, remember that *the **zeros** of a function are all those values of x where the function is equal to zero*.

Activities:

1) If you ignore the air resistance, the formula $h(t) = -5 \cdot t^2 + 10 \cdot t$ explains approximately the height h (in meters) of an object which is thrown from the ground up in the air depending on the time t (in seconds). How long does the object take to fall on the ground ($h = 0$)?

2) Look at the parabola described by the function $h(t)$[123]. *What does the resolution of the equation* $h(t) = 0$ *mean graphically?*

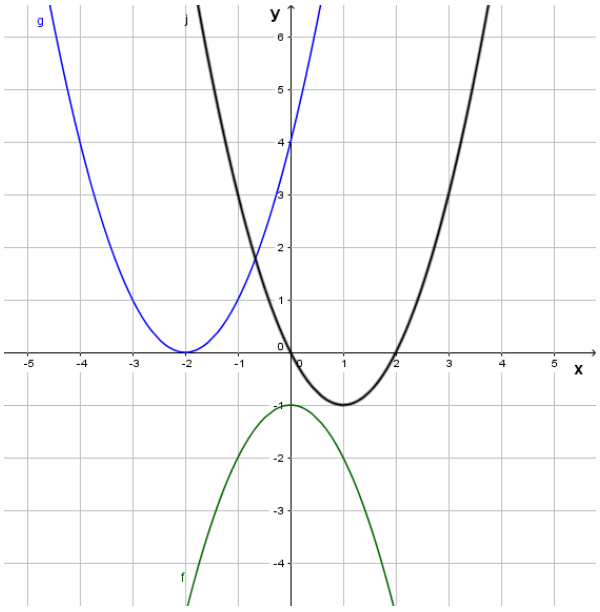


_____

_____

3) Given the graphs of the following quadratic functions, find their zeros graphically:

$f(x) = -x^2 - 1$ $\quad$ $g(x) = x^2 + 4x + 4$ $\quad$ $j(x) = x^2 - 2x$



Does the function f(x) have any zeros? If yes, how many? _____

Does the function g(x) have any zeros? If yes, how many? _____

Does the function j(x) have any zeros? If yes, how many? _____

[123] h= height; t= time.

Activity 5: Quadratic equations

Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____

Summary:

In our previous activity we found out that, given a quadratic function $f(x) = ax^2 + bx + c$, the difficulty in defining the **two zeros of f** (if any) can be dealt in two ways:

- **Graphically:** on the Cartesian plane you can identify the abscissas of the points of intersection (if any) of the parabola with the x-axis.
- **Algebraically:** you can define the solutions (if any) of the quadratic equation in the unknown x: $ax^2 + bx + c = 0$.

Problem:

What does this mean in algebra: *"define the solutions (if any) of the quadratic equation in the unknown x: $ax^2 + bx + c = 0$"*? How do you solve a generic quadratic equation: $ax^2 + bx + c = 0$?

How to solve a quadratic equation

First of all, we have to say that the **normal** form is $ax^2 + bx + c = 0$.
Starting from a quadratic equation expressed in normal form, we will always consider that $\boldsymbol{a \neq 0}$. Otherwise, if $a = 0$ we would have to go back to study a simple equation that we already know how to solve. Moreover, if $b \neq 0$ and $c \neq 0$, we will have a **complete** equation.

If you want to know if there are any real solutions to a complete quadratic equation, you only need to calculate the value of the **delta** $\Delta = \boldsymbol{b^2 - 4ac}$ which is also called **discriminant** because of its discriminating importance.

In general, depending on the value of the discriminant, you can find three cases:

1. If $\Delta > 0$: the equation has **two real and distinct solutions**:

$$x_1 = \frac{-b+\sqrt{b^2-4ac}}{2a} \quad \text{and} \quad x_2 = \frac{-b-\sqrt{b^2-4ac}}{2a}$$

2. If $\Delta = 0$: the equation **has two real coincident solutions**:

$$x_1 = x_2 = \frac{-b}{2a}$$

3. If $\Delta < 0$: the equation **does not have any real solutions**, i.e. it is impossible in R .

Activities:

1) Find the solutions (if any) of the following quadratic equations and show all the steps you follow to solve them:

$$\boldsymbol{3x^2 - x + 1 = 0} \qquad \boldsymbol{2x^2 + 3x - 2 = 0} \qquad \boldsymbol{4x^2 - 12x + 9 = 0} \qquad \boldsymbol{\frac{1}{2}x^2 + x - 1} = 0$$

Activity 6: 1st group test

Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____

Rules:

In this activity each group has to draw the graph of 3/4 parabolas and to solve 6/8 quadratic equations.

20 minutes:

Each member of the group has to draw the graph of a parabola and solve two equations. These exercises have to be done by each member alone.

15 minutes:

At the end, every member has hand the sheets to the **reader** who will read them and discuss the solutions found with the group. If a member or the reader himself/herself has any questions or needs any explanation or corrections, the **mediator** will stop the reading and he/she will coordinate the discussion in order to meet a mutual position.

During the discussions **ALL** members have to check the exercises of the other group members because it is important to understand the topic completely before the final individual test.

Once you reach a mutual position, the **writer** only will write:

1 – the possible corrections and/or additions on each paper sheet in a written form;
2 – the final answer shared by each member of the group in three lines.

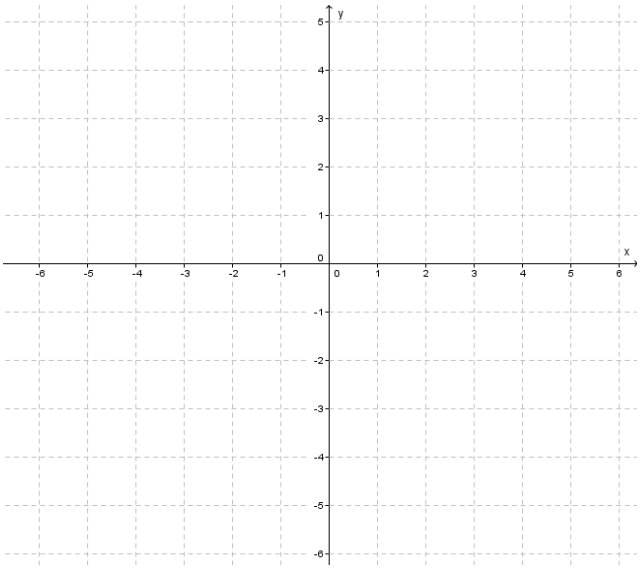
20 minutes:

Finally, each **presenter** will be asked by the teacher to explain the results of his/her group to the whole class at the end of the discussion.

Let's start!

Reader's sheet

- *Draw the graph of* $\boldsymbol{f(x) = 2x^2 - 6x}$ *and define* <u>*both graphically and algebraically*</u>*:*
    - *the coordinates of the vertex* $V(x_v, y_v)$*;*
    - *the equation of the axis of symmetry;*
    - *the coordinates of the point of intersection with the y-axis;*
    - *the coordinates of the points of intersection with the x-axis (start by finding the zeros of the function).*



<u>Writer:</u>

- *Define the zeros of the quadratic function* $\boldsymbol{f(x) = -x^2 + 8x - 7}$*:*

<u>Writer:</u>

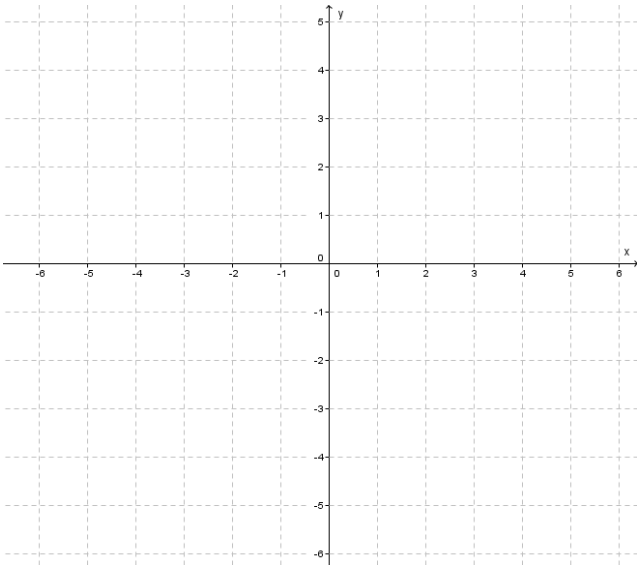
- *Solve the following equation and discuss the final result:*

$$\boldsymbol{4(2x - 1)^2 - 6x(3x + 1) = 4 - 6x}$$

<u>Writer:</u>

Mediator's sheet

- *Draw the graph of* $\boldsymbol{f(x) = x^2 - 3}$ *and define* <u>*both graphically and algebraically*</u>*:*
    - *the coordinates of the vertex* $V(x_v, y_v)$*;*
    - *the equation of the axis of symmetry;*
    - *the coordinates of the point of intersection with the y-axis;*
    - *the coordinates of the points of intersection with the x-axis (start by finding the zeros of the function).*



Writer:

- *Define the zeros of the quadratic function* $\boldsymbol{f(x) = -2x^2 + 3x - 2}$*:*

Writer:

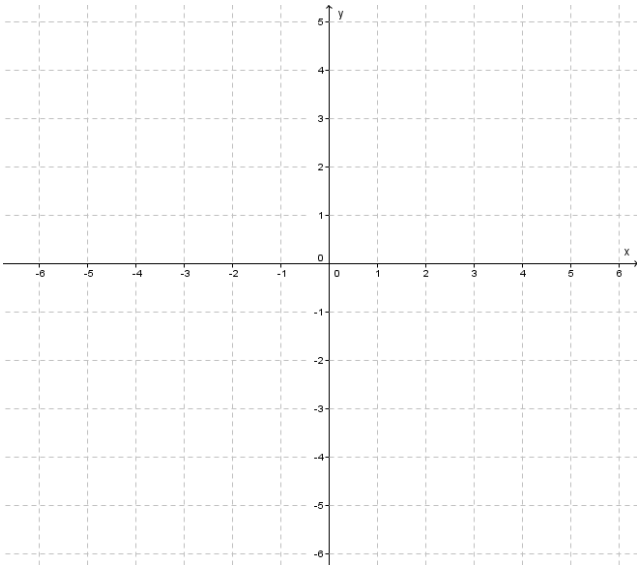
- *Solve the following equation and discuss the final result:*

$$\boldsymbol{x(5 - x) - (6 - x)(6 + 5) = x(x + 1)}$$

Writer:

Writer's sheet

- *Draw the graph of* $\boldsymbol{f(x) = -x^2 - 3}$ *and define* <u>*both graphically and algebraically*</u>*:*
  - *the coordinates of the vertex* $V(x_v, y_v)$*;*
  - *the equation of the axis of symmetry;*
  - *the coordinates of the point of intersection with the y-axis;*
  - *the coordinates of the points of intersection with the x-axis (start by finding the zeros of the function).*



Writer:

- *Define the zeros of the quadratic function* $\boldsymbol{f(x) = x^2 - 5x + 6}$*:*

Writer:

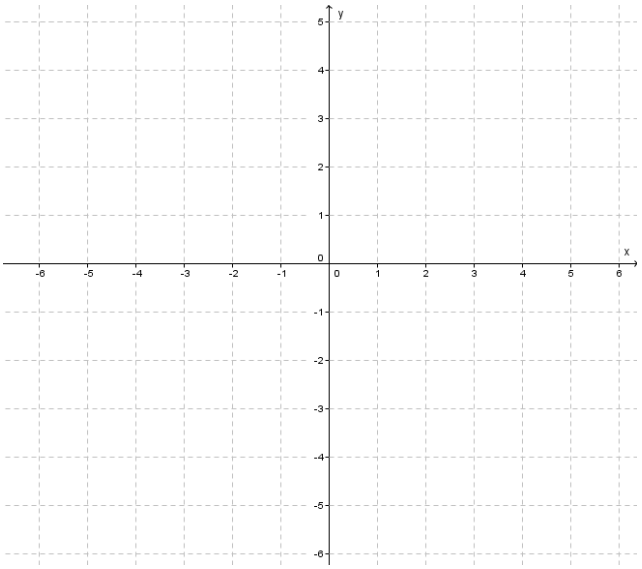
- *Solve the following equation and discuss the final result:*

$$\boldsymbol{3(x^2 + 2) - 3(x + 2)(x - 2) - 6 = 5x^2 - (2x + 3)^2 + 32}$$

Writer:

Presenter's sheet

- *Draw the graph of* $\boldsymbol{f(x) = x^2 - x}$ *and define* <u>*both graphically and algebraically*</u>*:*
    - *the coordinates of the vertex* $V(x_v, y_v)$*;*
    - *the equation of the axis of symmetry;*
    - *the coordinates of the point of intersection with the y-axis;*
    - *the coordinates of the points of intersection with the x-axis (start by finding the zeros of the function).*



Writer:

- *Define the zeros of the quadratic function* $\boldsymbol{f(x) = -x^2 + 4x - 4}$*:*

Writer:

- *Solve the following equation and discuss the final result:*

$$\boldsymbol{(x - 3)(x + 3) = 3x(x - 1) + 3x - 9}$$

Writer:

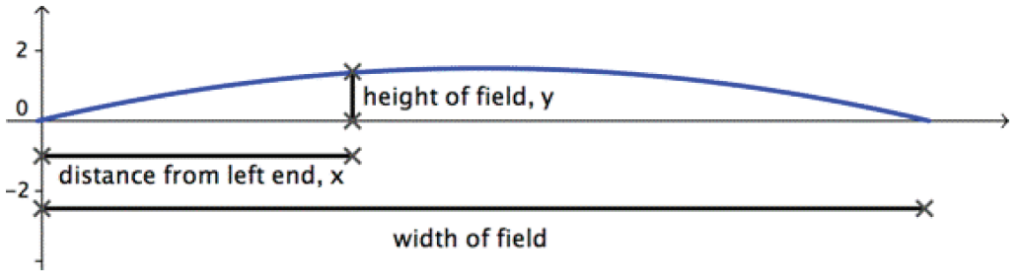
Activity 7: Challenge!

Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____

Problem 1:

Although a stadium field of synthetic turf appears to be flat, its surface is actually shaped like a parabola. This is so that rainwater runs off to the sides. If we take a cross section of the turf, the surface can be modeled by: $\boldsymbol{y = -0,000234 \cdot (x - 80)^2 + 1,5}$, where *x* is the distance from the left end of the field and *y* is the height of the field.

What is the width of the field?



Introduction:

The equation $h(t) = -16t^2 + v_0 \cdot t + h_0$ is commonly used to model an object that is launched or thrown. The variable *h* represents the height in feet, and *t* represents the time in seconds. The other two values are usually given numbers: h_0 is the initial height in feet and v_0 is the initial velocity in feet/second.

When working with this equation, we assume the object is in "free fall", which means it is moving under the sole influence of gravity. There is no air resistance or any other interference of any kind (not so likely in the real world, but still, these equations are quite helpful).

Problem 2:

A ball is launched upward at 48 ft/s from a platform that is 100 ft. high. Find the maximum height the ball reaches and how long it will take to get there.

Activity 8: The sign of a quadratic function

Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____

Summary:

Throughout our last activities, we know now how to draw the graph of a quadratic function on the Cartesian plane starting from its expression. Therefore, given a generic quadratic function like $f(x) = a \cdot x^2 + b \cdot x + c$, now we know how to define:

- Its **vertex V**, whose coordinates are: $x_V = -\frac{b}{2a}$, while for y_V you will only need to calculate the value of the function in x_V ($y_V = f(x_V) = a \cdot x_V^2 + b \cdot x_V + c$);

- The equation of its **axis of symmetry**: $= x_V$, i.e. $x = -\frac{b}{2a}$;

- Its **concavity** (from the sign of the coefficient *a*);

- Its **intersection with the *y*-axis** (given by the point of coordinates $(0; c)$);

- The **zeros of the function**, i.e. the abscissas of the (possible) intersections of its graph with the *x*-axis, which can be found from the resolution of the equation: $a \cdot x^2 + b \cdot x + c = 0$.

The last step we need to develop is the **study of the sign** of a quadratic function.

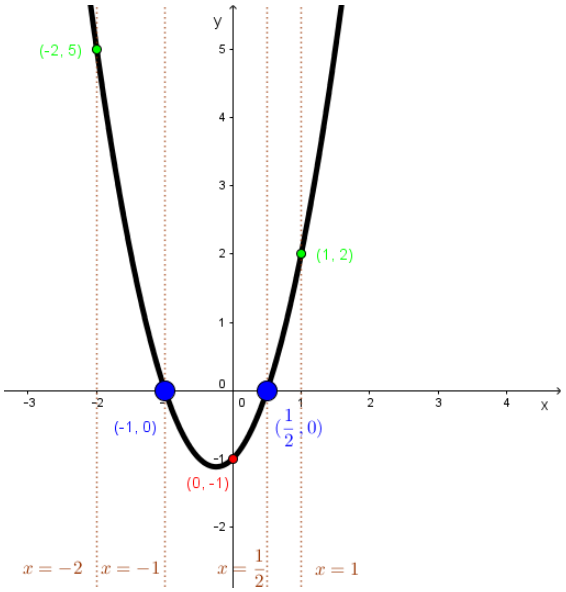
Problem:

What does "*study the sign of a quadratic function*" mean?

Definition: ***The study of the sign of a quadratic function*** *means that you identify those values of x that make the function have positive values* ($f(x) > 0$) *or negative values* ($f(x) < 0$) *or, in the end, zero value* ($f(x) = 0$).

Activities:

1) *Let's have a look at the function* $f(x) = 2 \cdot x^2 + x - 1$, *whose graph is:*



We want to study the sign of this function. Let's start with a few "attempts":

For $x = 2$ *, what value does* $f(x)$ *assume? Is it positive, negative or zero?* $f(x)$ *equals* __ *and so it is* _____

For $x = -1$ *what value does* $f(x)$ *assume? Is it positive, negative or zero?* $f(x)$ *equals* __ *and so it is* _____

For $x = 0$ *what value does* $f(x)$ *assume? Is it positive, negative or zero?* $f(x)$ *equals* __ *and so it is* _____

For $x = \frac{1}{2}$ *what value does* $f(x)$ *assume? Is it positive, negative or zero?* $f(x)$ *equals* __ *and so it is* _____

For $x = 1$ *what value does* $f(x)$ *assume? Is it positive, negative or zero?* $f(x)$ *equals* __ *and so it is* _____

As you can see, the two points of intersection of the parabola with the *x-axis*: $P_1\ (-1{,}0)$ and $P_2\ \left(\frac{1}{2}, 0\right)$ have been already identified in the graph. From our previous activities, we already know how to identify their abscissas and so we only need to solve the equation $a \cdot x^2 + b \cdot x + c = 0$ (in our case it is: $2 \cdot x^2 + x - 1 = 0$). These values of x (if any) are the only ones in which the function assumes zero value. Therefore, in our next exercises we have to remember that, using this method, we can already identify *"the values of x (if any) for which the function gets zero value"* (from the definition of "study of the sign of a quadratic function", case $f(x) = 0$).

2) According to the previous graph, let's try to use the intersection of the quadratic function $f(x) = 2 \cdot x^2 + x - 1$ *with the x-axis in the points of abscissa* $x = -1$ *and* $x = \frac{1}{2}$ *to complete the study of the sign. For which values of x do the cases below count?*

- $f(x) = 0$ *when* $x = -1$ *and* $x = \frac{1}{2}$*;*
- $f(x) > 0$ *when* _____
- $f(x) < 0$ *when* _____

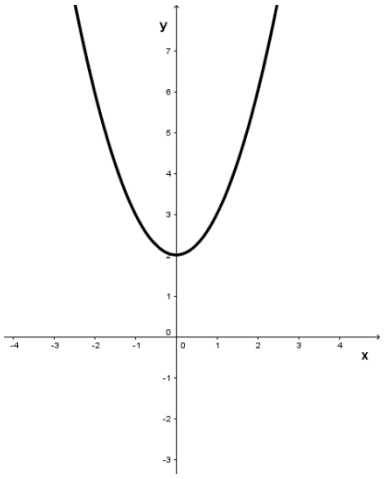
Therefore, what relationship can we identify between the study of the sign and the abscissas of the points of intersection (when they exist)?

_____

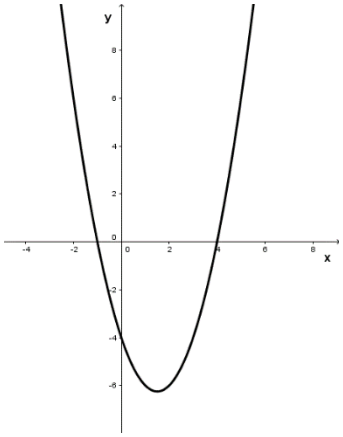
_____

3) Study the sign of the quadratic functions already plotted at home:

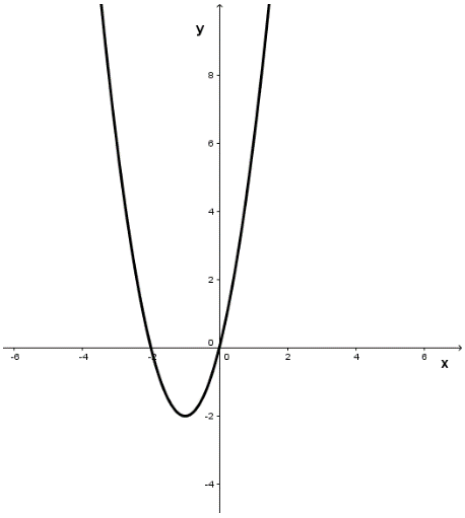
1. $f(x) = x^2 + 2$



2. $f(x) = x^2 - 3x - 4$



3. $f(x) = 2x^2 + 4x$



Activity 9: Quadratic inequalities

Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____

Summary:

In the previous activity we analyzed the **"study of the sign of a quadratic function $f(x) = ax^2 + bx + c$"**.

The study of the sign of a quadratic function means that you identify those values of x that make the function have positive values ($f(x) > 0$) or negative values ($f(x) < 0$) or, in the end, zero value ($f(x) = 0$).

Generally speaking, once the points of intersection (if any) of the parabola with the *x*-axis are identified, it is possible to study the sign of the function by following these steps:

- Split the study of the sign in the cases $f(x) > 0$ and $f(x) < 0$ ($f(x) = 0$ (we already knew this from the study of the zeros of a function).
- Identify, by observing the graph of the parabola, the intervals of the x in which $f(x) > 0$ and the intervals of the x in which $f(x) < 0$, intervals whose extreme values strictly depend on the zeros x_1 and x_2 (if any) of the function.

Introduction:

Now let's see what **"solving a quadratic inequality"** means:

A quadratic inequality is a disparity like: $ax^2 + bx + c > 0$ or $ax^2 + bx + c < 0$.

Quadratic inequalities can be taken as questions. In fact:

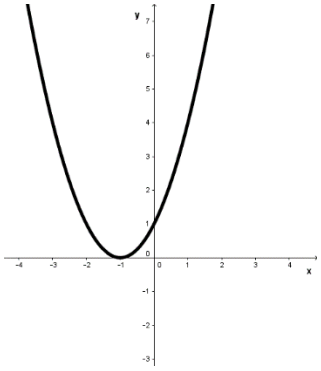
- $ax^2 + bx + c > 0$ is the equivalent of asking *"for which x is the expression: $ax^2 + bx + c$ positive?"*
- $ax^2 + bx + c < 0$ is the equivalent of asking *"for which x is the expression: $ax^2 + bx + c$ negative?"*

Solving a quadratic inequality means identifying the set of all real x that verify the associated disparity.

Activities:

1a) Look at the graph of the quadratic function $f(x) = x^2 + 2x + 1$ and identify its zeros graphically and algebraically.

Graphically:



Algebraically:

_____

1b) If you only look at the graph of the quadratic function $f(x) = x^2 + 2x + 1$, would you be able to say for which values of x is the inequality $x^2 + 2x + 1 \geq 0$ satisfied?

_____

Conclusion:

Solving a quadratic inequality in the form $ax^2 + bx + c > 0$ is the same as studying the sign of the function $f(x) = ax^2 + bx + c$ and then focus only on the case $f(x) > 0$. Sure enough $f(x) > 0$ is the same as studying: $ax^2 + bx + c > 0$.

Problem:

Do we need all those steps which are required to draw the graph of a quadratic function or can we just use some of them in order to solve a quadratic inequality?

_____
_____

2) For which values of x is: $-x^2 - 2x - 1 \leq 0$*?*

3) For which values of x is: $\frac{2}{3}x^2 - 1 \geq 0$*?*

Activity 10: 2nd group test

Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____
Name: _____ Surname: _____ Role: _____

Rules:

In this activity each group has to study the sign of 3/4 quadratic functions and solve 6/8 quadratic inequalities.

30 minutes:

Each member of the group has to study the sign and solve two quadratic inequalities. These exercises have to be done by each member alone.

20 minutes:

At the end, every member has hand the sheets to the **reader** who will read them and discuss the solutions with the group. If a member or the reader himself/herself has any questions or needs any explanation or corrections, the **mediator** will stop the reading and he/she will coordinate the discussion in order to meet a mutual position.

During the discussions, **ALL** members have to check the exercises of the other group members because it is important to understand the topic completely before the final individual test.

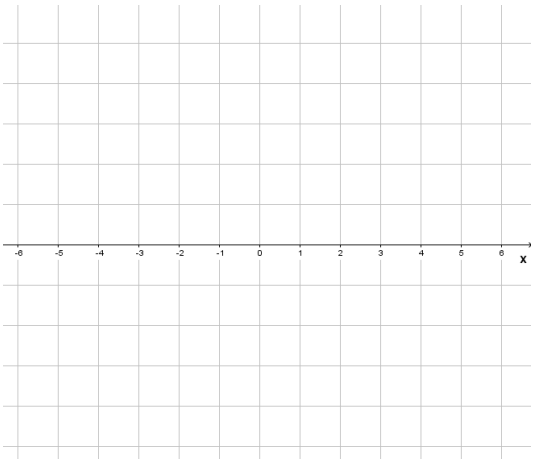
Once you reach a mutual position, only the **writer** has to write:

1 – the possible corrections and/or additions on each paper sheet in a written form;
2 – the final answer shared by each member of the group in three lines.

Let's start!

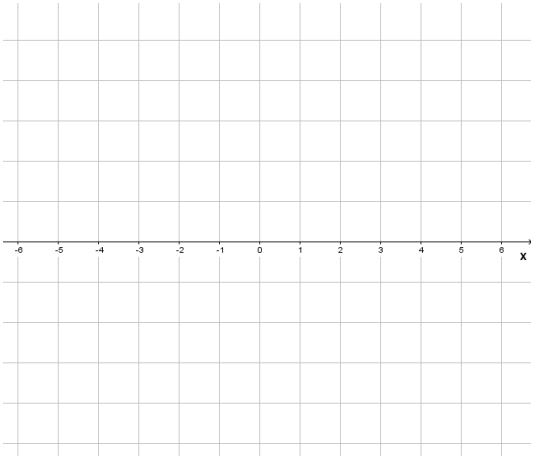
Reader's sheet (1)

- *Study the sign of the quadratic function* $\boldsymbol{f(x) = x^2 - 2x + 1}$*:*



Writer:

- *Solve the following quadratic inequality:* $\boldsymbol{2x^2 - 3x + 1 > 0}$.

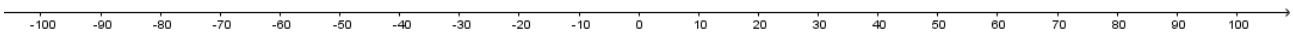


Writer:

Reader's sheet (2)

- *Solve the following quadratic inequality:*

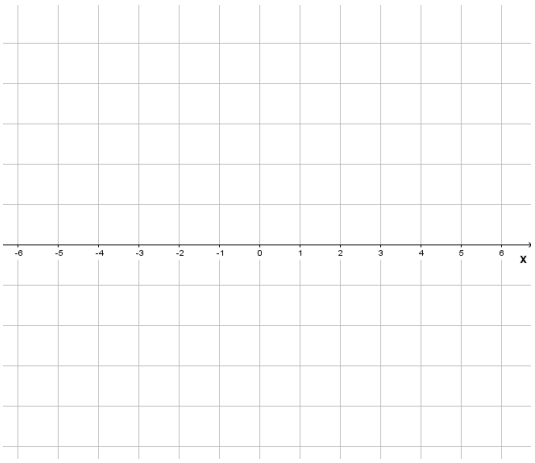
$$\boldsymbol{25 \cdot (4x - 1) + (x - 5)^2 \geq 0}$$



Writer:

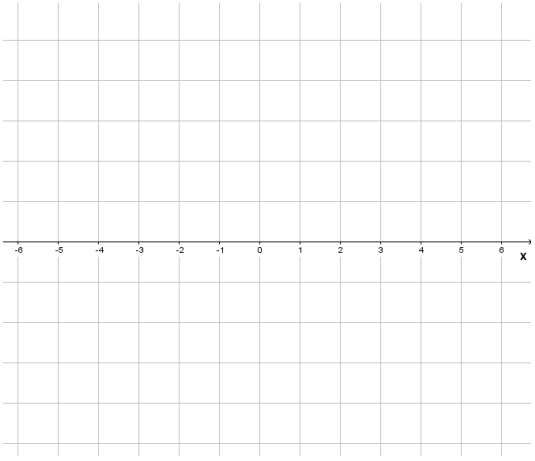
Mediator's sheet (1)

- *Study the sign of the quadratic function* $\boldsymbol{f(x) = -2x^2 - 1}$*:*



Writer:

- *Solve the following quadratic inequality:* $\boldsymbol{x^2 - x + 3 \geq 0}$.

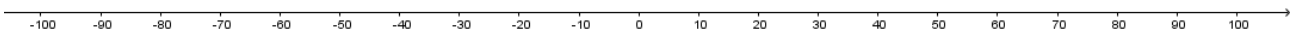


Writer:

Mediator's sheet (2)

- *Solve the following quadratic inequality:*

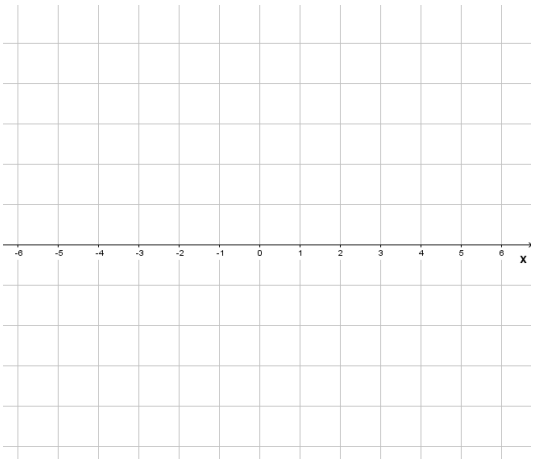
$$\boldsymbol{4 \cdot (x^2 - 1) < 4x - 1}$$



Writer:

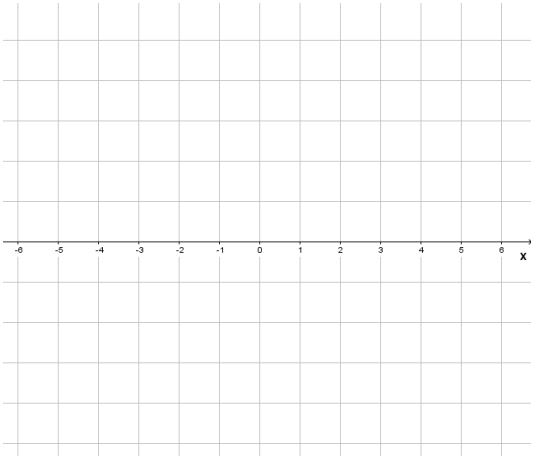
Writer's sheet (1)

- *Study the sign of the quadratic function* $\boldsymbol{f(x) = -x^2 + 6x - 9}$*:*



Writer:

- *Solve the following quadratic inequality:* $\boldsymbol{4x^2 - x < 0}$.

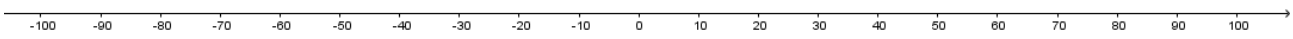


Writer:

Writer's sheet (2)

- *Solve the following quadratic inequality:*

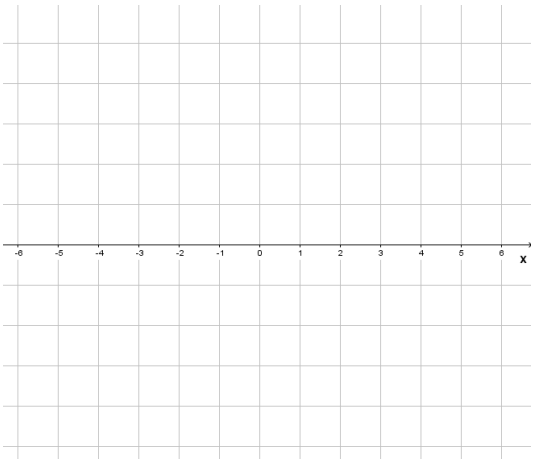
$$\frac{\boldsymbol{2x - (3 + x^2)}}{\boldsymbol{2}} \boldsymbol{- 1} > \frac{\boldsymbol{3 - x^2}}{\boldsymbol{4}}$$



Writer:

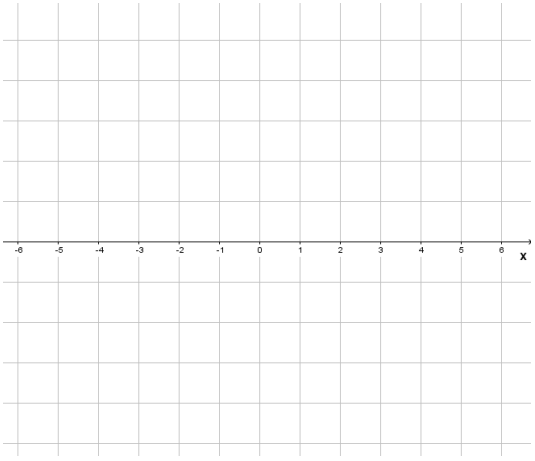
Presenter's sheet (1)

- *Study the sign of the quadratic function* $\boldsymbol{f(x) = x^2 - 3x + 2}$*:*



Writer:

- *Solve the following quadratic inequality:* $\boldsymbol{-x^2 + 3x < 0}$.

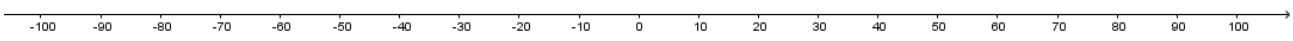


Writer:

Presenter's sheet (2)

- *Solve the following quadratic inequality:*

$$\boldsymbol{-x \cdot (7x - 1) < 2x - 2 \cdot (x - 1)}$$



Writer:

Appendix D.2: Observation protocols of the mutuality parameter

Legend	
i A $_{j,k}$	The student *i* who belongs to the class Aj and to the group *k*.
Obs. 1 / Obs. 2	The two observers who evaluated the mutuality parameter.
Text: Black	Nothing has changed since the first observation – two observers.
Text: Red	The evaluation has changed following the discussion with the other observer.
Background: white	A one unit gap exists between the two oberservers' evaluations (it does not matter whether this happened before or after the discussion).
Background: green	The observers' evaluations coincide (it does not matter whether this happened before or after the discussion).

Appendix D.2.1: Observation protocols of the mutuality parameter - Class A_3

Activity 1 - Ex. 1-2-3	Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader		
Students	1 $A_{3,1}$	1 $A_{3,1}$	average	variance	a_{wg}	2 $A_{3,1}$	2 $A_{3,1}$	average	variance	a_{wg}	3 $A_{3,1}$	3 $A_{3,1}$	average	variance	a_{wg}	4 $A_{3,1}$	4 $A_{3,1}$	average	variance	a_{wg}
item 1	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 2	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	3,00	4,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 7	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 9	3,00	4,00	3,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 10	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 11	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 12	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
Average scores	2,33	2,58			0,97	1,58	1,67			0,99	3,67	3,67			1,00	3,58	3,50			0,99
Mutuality	2,46					1,63					3,67					3,54				

Activity 1 - Ex. 4-5-6-7	Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader		
Students	1 $A_{3,1}$	1 $A_{3,1}$	average	variance	a_{wg}	2 $A_{3,1}$	2 $A_{3,1}$	average	variance	a_{wg}	3 $A_{3,1}$	3 $A_{3,1}$	average	variance	a_{wg}	4 $A_{3,1}$	4 $A_{3,1}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 2	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87
item 5	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87
item 6	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00
item 9	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	5,00	4,00	4,50	0,50	0,71
item 10	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 11	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 12	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71	5,00	4,00	4,50	0,50	0,71
Average scores	1,50	1,67			0,97	1,00	1,00			1,00	4,42	4,17			0,93	4,17	4,00			0,93
Mutuality	1,58					1,00					4,29					4,08				

Activity 2 - Ex. 1-2-3	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	1 $A_{3,1}$	1 $A_{3,1}$	average	variance	a_{wg}	2 $A_{3,1}$	2 $A_{3,1}$	average	variance	a_{wg}	3 $A_{3,1}$	3 $A_{3,1}$	average	variance	a_{wg}	4 $A_{3,1}$	4 $A_{3,1}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87
item 2	2,00	3,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 4	2,00	3,00	2,50	0,50	0,87	1,00	2,00	1,50	0,50	0,71	2,00	3,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	3,00	4,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 6	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	2,00
item 7	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	2,00	1,00	1,50	0,50	0,71
item 8	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	2,00	1,00	1,50	0,50	0,71
item 9	2,00	3,00	2,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
item 10	3,00	4,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87
item 11	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 12	3,00	3,00	3,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
Average scores	2,17	2,58			0,94	1,75	2,08			0,93	3,17	3,25			0,91	2,50	2,17			0,99
Mutuality	2,38					1,92					3,21					2,33				

Activity 2 - Ex. 4	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	1 $A_{3,1}$	1 $A_{3,1}$	average	variance	a_{wg}	2 $A_{3,1}$	2 $A_{3,1}$	average	variance	a_{wg}	3 $A_{3,1}$	3 $A_{3,1}$	average	variance	a_{wg}	4 $A_{3,1}$	4 $A_{3,1}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
item 6	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 9	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87
item 10	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 11	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 12	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
Average scores	1,00	1,00			1,00	1,17	1,25			0,99	3,42	3,42			0,97	3,42	3,17			0,97
Mutuality	1,00					1,21					3,42					3,29				

1st group test	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter		
Students	1 $A_{3,1}$	1 $A_{3,1}$	average	variance	a_{wg}	2 $A_{3,1}$	2 $A_{3,1}$	average	variance	a_{wg}	3 $A_{3,1}$	3 $A_{3,1}$	average	variance	a_{wg}	4 $A_{3,1}$	4 $A_{3,1}$	average	variance	a_{wg}
item 1	4,00	4,00	4,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	2,00	3,00	2,50	0,50	0,87
item 5	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 7	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 8	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00
item 9	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71
item 10	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 11	3,00	4,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00
item 12	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71
Average scores	2,83	3,08			0,95	1,08	1,17			0,99	2,92	3,25			0,90	3,42	3,33			0,94
Mutuality	2,96					1,13					3,08					3,38				

Activity 8 - Ex. 1-2	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2				Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	1 $A_{3,1}$	1 $A_{3,1}$	average	variance	a_{wg}	2 $A_{3,1}$	2 $A_{3,1}$	average	variance	a_{wg}	3 $A_{3,1}$	3 $A_{3,1}$	average	variance	a_{wg}	4 $A_{3,1}$	4 $A_{3,1}$	average	variance	a_{wg}
item 1	2,00	3,00	2,50	0,50	0,87						4,00	4,00	4,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87
item 2	3,00	3,00	3,00	0,00	1,00						5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 3	3,00	3,00	3,00	0,00	1,00						4,00	5,00	4,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 4	2,00	3,00	2,50	0,50	0,87						5,00	5,00	5,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	3,00	3,00	3,00	0,00	1,00						3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 6	2,00	3,00	2,50	0,50	0,87						5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 7	2,00	1,00	1,50	0,50	0,71						1,00	2,00	1,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00
item 8	2,00	3,00	2,50	0,50	0,87						4,00	5,00	4,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00
item 9	2,00	2,00	2,00	0,00	1,00						4,00	3,00	3,50	0,50	0,87	5,00	4,00	4,50	0,50	0,71
item 10	3,00	3,00	3,00	0,00	1,00						5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 11	3,00	3,00	3,00	0,00	1,00						5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 12	3,00	4,00	3,50	0,50	0,87						5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
Average scores	2,50	2,83			0,92						4,17	4,33			0,92	3,67	3,67			0,97
Mutuality	2,67										4,25					3,67				

2nd group test	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	reader		
Students	1 $A_{3,1}$	1 $A_{3,1}$	average	variance	a_{wg}	2 $A_{3,1}$	2 $A_{3,1}$	average	variance	a_{wg}	3 $A_{3,1}$	3 $A_{3,1}$	average	variance	a_{wg}	4 $A_{3,1}$	4 $A_{3,1}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 5	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 6	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 7	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 8	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 9	2,00	3,00	2,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 10	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 11	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71
item 12	2,00	3,00	2,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
Average scores	2,25	2,50			0,97	1,83	2,00			0,98	3,67	3,67			1,00	3,58	3,83			0,94
Mutuality	2,38					1,92					3,67					3,71				

Activity 1 - Ex. 1-2-3	Obs. 1	Obs. 2				Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer		
Students	1 $A_{3,2}$	1 $A_{3,2}$	average	variance	a_{wg}	2 $A_{3,2}$	2 $A_{3,2}$	average	variance	a_{wg}	3 $A_{3,2}$	3 $A_{3,2}$	average	variance	a_{wg}	4 $A_{3,2}$	4 $A_{3,2}$	average	variance	a_{wg}
item 1						1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 2						3,00	4,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 3						1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4						1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 5						3,00	4,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 6						4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 7						1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8						1,00	2,00	1,50	0,50	0,71	1,00	2,00	1,50	0,50	0,71	1,00	2,00	1,50	0,50	0,71
item 9						2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 10						4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 11						3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 12						3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
Average scores						2,25	2,58			0,93	2,58	2,75			0,97	1,92	2,08			0,95
Mutuality						2,42					2,67					2,00				

Activity 1 - Ex. 4-5-6-7	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	1 $A_{3,2}$	1 $A_{3,2}$	average	variance	a_{wg}	2 $A_{3,2}$	2 $A_{3,2}$	average	variance	a_{wg}	3 $A_{3,2}$	3 $A_{3,2}$	average	variance	a_{wg}	4 $A_{3,2}$	4 $A_{3,2}$	average	variance	a_{wg}
item 1	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87
item 3	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 6	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
item 7	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 9	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 10	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 11	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
item 12	2,00	3,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
Average scores	1,42	1,50			0,99	2,50	2,25			0,97	2,83	2,67			0,98	2,42	2,25			0,94
Mutuality	1,46					2,38					2,75					2,33				

Activity 2 - Ex. 1-2-3	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	1 $A_{3,2}$	1 $A_{3,2}$	average	variance	a_{wg}	2 $A_{3,2}$	2 $A_{3,2}$	average	variance	a_{wg}	3 $A_{3,2}$	3 $A_{3,2}$	average	variance	a_{wg}	4 $A_{3,2}$	4 $A_{3,2}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 3	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 9	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 10	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 11	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 12	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
Average scores	1,08	1,08			1,00	3,33	3,25			0,97	1,75	1,58			0,97	2,75	2,58			0,98
Mutuality	1,08					3,29					1,67					2,67				

Activity 2 - Ex. 4	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	1 $A_{3,2}$	1 $A_{3,2}$	average	variance	a_{wg}	2 $A_{3,2}$	2 $A_{3,2}$	average	variance	a_{wg}	3 $A_{3,2}$	3 $A_{3,2}$	average	variance	a_{wg}	4 $A_{3,2}$	4 $A_{3,2}$	average	variance	a_{wg}
item 1	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 9	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	4,00	4,00	4,00	0,00	1,00
item 10	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 11	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	1,00	1,50	0,50	1,00	4,00	3,00	3,50	0,50	0,87
item 12	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
Average scores	1,08	1,08			1,00	2,33	2,17			0,98	1,25	1,25			0,98	2,75	2,58			0,98
Mutuality	1,08					2,25					1,25					2,67				

1st group test	Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2				Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter		
Students	1 $A_{3,2}$	1 $A_{3,2}$	average	variance	a_{wg}	2 $A_{3,2}$	2 $A_{3,2}$	average	variance	a_{wg}	3 $A_{3,2}$	3 $A_{3,2}$	average	variance	a_{wg}	4 $A_{3,2}$	4 $A_{3,2}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 2	2,00	3,00	2,50	0,50	0,87						3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	5,00	5,00	5,00	0,00	1,00						2,00	3,00	2,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87
item 6	2,00	2,00	2,00	0,00	1,00						3,00	3,00	3,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00						4,00	3,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00						2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 9	1,00	1,00	1,00	0,00	1,00						3,00	3,00	3,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 10	3,00	3,00	3,00	0,00	1,00						3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 11	2,00	2,00	2,00	0,00	1,00						3,00	3,00	3,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 12	2,00	2,00	2,00	0,00	1,00						4,00	3,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00
Average scores	1,83	1,92			0,99						2,50	2,42			0,97	3,17	3,08			0,95
Mutuality	1,88										2,46					3,13				

Activity 8 - Ex. 1-2	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	1 $A_{3,2}$	1 $A_{3,2}$	average	variance	a_{wg}	2 $A_{3,2}$	2 $A_{3,2}$	average	variance	a_{wg}	3 $A_{3,2}$	3 $A_{3,2}$	average	variance	a_{wg}	4 $A_{3,2}$	4 $A_{3,2}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
item 6	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71	5,00	4,00	4,50	0,50	0,71
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	4,00	4,00	4,00	0,00	1,00
item 9	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 10	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 11	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00
item 12	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
Average scores	1,00	1,00			1,00	1,83	1,75			0,98	2,42	2,33			0,94	3,33	3,08			0,95
Mutuality	1,00					1,79					2,38					3,21				

2nd group test	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2			
Students	1 $A_{3,2}$	1 $A_{3,2}$	average	variance	a_{wg}	2 $A_{3,2}$	2 $A_{3,2}$	average	variance	a_{wg}	3 $A_{3,2}$	3 $A_{3,2}$	average	variance	a_{wg}	4 $A_{3,2}$	4 $A_{3,2}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 2	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00					
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 5	2,00	2,00	2,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87					
item 6	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00					
item 7	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 8	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71					
item 9	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00					
item 10	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87					
item 11	2,00	2,00	2,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00					
item 12	2,00	2,00	2,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00					
Average scores	1,42	1,42			1,00	2,42	2,17			0,97	3,17	3,08			0,95					
Mutuality	1,42					2,29					3,13									

Activity 1 - Ex. 1-2-3	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	1 $A_{3,3}$	1 $A_{3,3}$	average	variance	a_{wg}	2 $A_{3,3}$	2 $A_{3,3}$	average	variance	a_{wg}	3 $A_{3,3}$	3 $A_{3,3}$	average	variance	a_{wg}	3 $A_{3,3}$	3 $A_{3,3}$	average	variance	a_{wg}
item 1	3,00	3,00	3,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 2	3,00	3,00	3,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	4,00	3,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 7	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	2,00	1,50	0,50	0,71	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 9	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 10	3,00	3,00	3,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 11	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 12	2,00	3,00	2,50	0,50	0,87	1,00	2,00	1,50	0,50	0,71	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
Average scores	2,25	2,33			0,95	2,17	1,92			0,93	1,25	1,17			0,98	1,25	1,33			0,99
Mutuality	2,29					2,04					1,21					1,29				

Activity 1 - Ex. 4-5-6-7	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	1 $A_{3,3}$	1 $A_{3,3}$	average	variance	a_{wg}	2 $A_{3,3}$	2 $A_{3,3}$	average	variance	a_{wg}	3 $A_{3,3}$	3 $A_{3,3}$	average	variance	a_{wg}	3 $A_{3,3}$	3 $A_{3,3}$	average	variance	a_{wg}
item 1	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 2	4,00	3,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 3	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	3,00	2,00	2,50	0,50	0,87	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
item 6	4,00	3,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	1,00	2,00	1,50	0,50	0,71
item 7	3,00	2,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	3,00	2,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 10	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 11	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 12	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
Average scores	3,08	2,67			0,94	1,75	1,67			0,98	1,42	1,50			0,99	1,08	1,17			0,93
Mutuality	2,88					1,71					1,46					1,13				

Activity 2 - Ex. 1-2-3	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	1 $A_{3,3}$	1 $A_{3,3}$	average	variance	a_{wg}	2 $A_{3,3}$	2 $A_{3,3}$	average	variance	a_{wg}	3 $A_{3,3}$	3 $A_{3,3}$	average	variance	a_{wg}	3 $A_{3,3}$	3 $A_{3,3}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	4,00	3,00	3,50	0,50	0,87	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	2,00	2,00	2,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 7	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 9	3,00	3,00	3,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 10	3,00	3,00	3,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 11	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 12	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
Average scores	2,50	2,33			0,98	1,08	1,42			0,92	1,08	1,08			1,00	2,00	2,00			1,00
Mutuality	2,42					1,25					1,08					2,00				

Activity 2 - Ex. 4	Obs. 1	Obs. 2				Obs. 1	Obs. 2				Obs. 1	Obs. 2				Obs. 1	Obs. 2			
Students	1 $A_{3,3}$	1 $A_{3,3}$	average	variance	a_{wg}	2 $A_{3,3}$	2 $A_{3,3}$	average	variance	a_{wg}	3 $A_{3,3}$	3 $A_{3,3}$	average	variance	a_{wg}	3 $A_{3,3}$	3 $A_{3,3}$	average	variance	a_{wg}
item 1																				
item 2																				
item 3																				
item 4																				
item 5																				
item 6																				
item 7																				
item 8																				
item 9																				
item 10																				
item 11																				
item 12																				
Average scores																				
Mutuality																				

1st group test	Obs. 1	Obs. 2				Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter		
Students	1 $A_{3,3}$	1 $A_{3,3}$	average	variance	a_{wg}	2 $A_{3,3}$	2 $A_{3,3}$	average	variance	a_{wg}	3 $A_{3,3}$	3 $A_{3,3}$	average	variance	a_{wg}	3 $A_{3,3}$	3 $A_{3,3}$	average	variance	a_{wg}
item 1						1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2						1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 3						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 7						1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 8						2,00	2,00	2,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 9						2,00	1,00	1,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 10						2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 11						2,00	2,00	2,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87
item 12						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
Average scores						1,33	1,25			0,98	2,08	1,92			0,98	1,67	1,58			0,99
Mutuality						1,29					2,00					1,63				

Activity 8 - Ex. 1-2	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	1 $A_{3,3}$	1 $A_{3,3}$	average	variance	a_{wg}	2 $A_{3,3}$	2 $A_{3,3}$	average	variance	a_{wg}	3 $A_{3,3}$	3 $A_{3,3}$	average	variance	a_{wg}	3 $A_{3,3}$	3 $A_{3,3}$	average	variance	a_{wg}
item 1	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 2	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 3	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 5	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 10	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 11	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 12	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
Average scores	1,92	1,83			0,91	1,08	1,08			1,00	1,08	1,08			1,00	2,50	2,50			0,98
Mutuality	1,88					1,08					1,08					2,50				

2nd group test	Obs. 1	Obs. 2				Obs. 1	Obs. 2				Obs. 1	Obs. 2				Obs. 1	Obs. 2			
Students	1 $A_{3,3}$	1 $A_{3,3}$	average	variance	a_{wg}	2 $A_{3,3}$	2 $A_{3,3}$	average	variance	a_{wg}	3 $A_{3,3}$	3 $A_{3,3}$	average	variance	a_{wg}	3 $A_{3,3}$	3 $A_{3,3}$	average	variance	a_{wg}
item 1																				
item 2																				
item 3																				
item 4																				
item 5																				
item 6																				
item 7																				
item 8																				
item 9																				
item 10																				
item 11																				
item 12																				
Average scores																				
Mutuality																				

Activity 1 - Ex. 1-2-3	Obs. 1	Obs. 2				Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer		
Students	1 $A_{3,4}$	1 $A_{3,4}$	average	variance	a_{wg}	2 $A_{3,4}$	2 $A_{3,4}$	average	variance	a_{wg}	3 $A_{3,4}$	3 $A_{3,4}$	average	variance	a_{wg}	4 $A_{3,4}$	4 $A_{3,4}$	average	variance	a_{wg}
item 1						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 2						2,00	3,00	2,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 3						1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00
item 4						2,00	2,00	2,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 5						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 6						2,00	2,00	2,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87
item 7						2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 8						2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
item 9						3,00	4,00	3,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 10						4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 11						4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 12						3,00	4,00	3,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87	4,00	5,00	4,50	0,50	0,71
Average scores						2,25	2,50			0,93	2,08	2,58			0,92	3,08	3,08			0,94
Mutuality						2,38					2,33					3,08				

Activity 1 - Ex. 4-5-6-7	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	1 $A_{3,4}$	1 $A_{3,4}$	average	variance	a_{wg}	2 $A_{3,4}$	2 $A_{3,4}$	average	variance	a_{wg}	3 $A_{3,4}$	3 $A_{3,4}$	average	variance	a_{wg}	4 $A_{3,4}$	4 $A_{3,4}$	average	variance	a_{wg}
item 1	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 2	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 3	4,00	4,00	4,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 4	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87
item 5	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 6	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 7	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	3,00	2,00	2,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	2,00	2,00	2,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 10	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 11	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 12	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00
Average scores	2,67	2,50			0,97	2,25	2,17			0,97	2,50	2,17			0,96	2,33	2,33			0,97
Mutuality	2,58					2,21					2,33					2,33				

Activity 2 - Ex. 1-2-3	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	1 $A_{3,4}$	1 $A_{3,4}$	average	variance	a_{wg}	2 $A_{3,4}$	2 $A_{3,4}$	average	variance	a_{wg}	3 $A_{3,4}$	3 $A_{3,4}$	average	variance	a_{wg}	4 $A_{3,4}$	4 $A_{3,4}$	average	variance	a_{wg}
item 1	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 2	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 3	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	2,00	2,00	2,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 5	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	3,00	2,00	2,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 7	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 8	4,00	3,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
item 9	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 10	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 11	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 12	3,00	2,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
Average scores	2,83	2,50			0,94	2,00	2,17			0,97	2,08	2,25			0,95	1,67	1,58			0,99
Mutuality	2,67					2,08					2,17					1,63				

Activity 2 - Ex. 4	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	1 $A_{3,4}$	1 $A_{3,4}$	average	variance	a_{wg}	2 $A_{3,4}$	2 $A_{3,4}$	average	variance	a_{wg}	3 $A_{3,4}$	3 $A_{3,4}$	average	variance	a_{wg}	4 $A_{3,4}$	4 $A_{3,4}$	average	variance	a_{wg}
item 1	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 6	4,00	4,00	4,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87
item 10	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 11	3,00	2,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 12	3,00	2,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
Average scores	2,58	2,42			0,92	1,67	1,75			0,99	2,25	2,00			0,97	2,08	2,08			0,98
Mutuality	2,50					1,71					2,13					2,08				

1st group test	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter		
Students	1 $A_{3,4}$	1 $A_{3,4}$	average	variance	a_{wg}	2 $A_{3,4}$	2 $A_{3,4}$	average	variance	a_{wg}	3 $A_{3,4}$	3 $A_{3,4}$	average	variance	a_{wg}	4 $A_{3,4}$	4 $A_{3,4}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	5,00	5,00	5,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	4,00	5,00	4,50	0,50	0,71	4,00	4,00	4,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	3,00	3,00	3,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71
item 6	5,00	5,00	5,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	4,00	5,00	4,50	0,50	0,71	4,00	4,00	4,00	0,00	1,00
item 7	4,00	5,00	4,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 8	5,00	5,00	5,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	4,00	5,00	4,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00
item 9	5,00	5,00	5,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 10	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 11	5,00	5,00	5,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71	3,00	3,00	3,00	0,00	1,00
item 12	5,00	5,00	5,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
Average scores	3,67	3,75			0,98	2,75	2,92			0,96	3,25	3,50			0,89	2,83	3,00			0,95
Mutuality	3,71					2,83					3,38					2,92				

Activity 8 - Ex. 1-2	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2				Obs. 1	Obs. 2	presenter		
Students	1 $A_{3,4}$	1 $A_{3,4}$	average	variance	a_{wg}	2 $A_{3,4}$	2 $A_{3,4}$	average	variance	a_{wg}	3 $A_{3,4}$	3 $A_{3,4}$	average	variance	a_{wg}	4 $A_{3,4}$	4 $A_{3,4}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						3,00	3,00	3,00	0,00	1,00
item 2	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00						3,00	3,00	3,00	0,00	1,00
item 3	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 4	3,00	2,00	2,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87						1,00	2,00	1,50	0,50	0,71
item 5	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 6	5,00	5,00	5,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87						3,00	4,00	3,50	0,50	0,87
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						2,00	3,00	2,50	0,50	0,87
item 8	3,00	2,00	2,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87						1,00	1,00	1,00	0,00	1,00
item 9	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00						2,00	2,00	2,00	0,00	1,00
item 10	4,00	3,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00						4,00	4,00	4,00	0,00	1,00
item 11	4,00	3,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00						3,00	4,00	3,50	0,50	0,87
item 12	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00						4,00	4,00	4,00	0,00	1,00
Average scores	2,92	2,67			0,94	2,50	2,42			0,97						2,33	2,67			0,94
Mutuality	2,79					2,46										2,50				

2nd group test	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2			
Students	1 $A_{3,4}$	1 $A_{3,4}$	average	variance	a_{wg}	2 $A_{3,4}$	2 $A_{3,4}$	average	variance	a_{wg}	3 $A_{3,4}$	3 $A_{3,4}$	average	variance	a_{wg}	4 $A_{3,4}$	4 $A_{3,4}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 2	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00					
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 6	3,00	4,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 7	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00					
item 8	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00					
item 9	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00					
item 10	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00					
item 11	5,00	4,00	4,50	0,50	0,71	4,00	5,00	4,50	0,50	1,00	3,00	4,00	3,50	0,50	0,87					
item 12	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00					
Average scores	2,92	2,92			0,97	2,83	2,83			0,99	2,25	2,33			0,99					
Mutuality	2,92					2,83					2,29									

Activity 1 - Ex. 1-2-3	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	1 $A_{3,5}$	1 $A_{3,5}$	average	variance	a_{wg}	2 $A_{3,5}$	2 $A_{3,5}$	average	variance	a_{wg}	3 $A_{3,5}$	3 $A_{3,5}$	average	variance	a_{wg}	4 $A_{3,5}$	4 $A_{3,5}$	average	variance	a_{wg}
item 1	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 2	2,00	3,00	2,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 4	2,00	3,00	2,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	2,00	1,50	0,50	0,71
item 6	2,00	1,00	1,50	0,50	0,71	4,00	4,00	4,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	3,00	3,00	3,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	2,00	1,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	2,00	3,00	2,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 10	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87
item 11	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87
item 12	2,00	3,00	2,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
Average scores	1,92	2,25			0,91	3,17	3,17			0,97	1,92	2,33			0,92	2,33	2,58			0,92
Mutuality	2,08					3,17					2,13					2,46				

Activity 1 - Ex. 4-5-6-7	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	1 $A_{3,5}$	1 $A_{3,5}$	average	variance	a_{wg}	2 $A_{3,5}$	2 $A_{3,5}$	average	variance	a_{wg}	3 $A_{3,5}$	3 $A_{3,5}$	average	variance	a_{wg}	4 $A_{3,5}$	4 $A_{3,5}$	average	variance	a_{wg}
item 1	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 2	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 7	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 9	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 10	5,00	4,00	4,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71
item 11	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 12	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
Average scores	3,25	3,25			0,95	3,42	3,42			1,00	3,00	3,00			1,00	3,08	2,83			0,95
Mutuality	3,25					3,42					3,00					2,96				

Activity 2 - Ex. 1-2-3	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2				Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	reader-mediator		
Students	1 $A_{3,5}$	1 $A_{3,5}$	average	variance	a_{wg}	2 $A_{3,5}$	2 $A_{3,5}$	average	variance	a_{wg}	3 $A_{3,5}$	3 $A_{3,5}$	average	variance	a_{wg}	4 $A_{3,5}$	4 $A_{3,5}$	average	variance	a_{wg}
item 1	4,00	3,00	3,50	0,50	0,87						3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 2	3,00	3,00	3,00	0,00	1,00						5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 3	2,00	2,00	2,00	0,00	1,00						2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	2,00	2,00	2,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00						2,00	3,00	2,50	0,50	0,87	1,00	2,00	1,50	0,50	0,71
item 6	3,00	4,00	3,50	0,50	0,87						5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 8	1,00	1,00	1,00	0,00	1,00						5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 9	2,00	3,00	2,50	0,50	0,87						4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 10	2,00	2,00	2,00	0,00	1,00						4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 11	2,00	3,00	2,50	0,50	0,87						4,00	4,00	4,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 12	2,00	3,00	2,50	0,50	0,87						5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
Average scores	2,08	2,33			0,94						3,42	3,50			0,99	3,83	3,92			0,95
Mutuality	2,21										3,46					3,88				

Activity 2 - Ex. 4	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	1 $A_{3,5}$	1 $A_{3,5}$	average	variance	a_{wg}	2 $A_{3,5}$	2 $A_{3,5}$	average	variance	a_{wg}	3 $A_{3,5}$	3 $A_{3,5}$	average	variance	a_{wg}	4 $A_{3,5}$	4 $A_{3,5}$	average	variance	a_{wg}
item 1	1,00	2,00	1,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 2	2,00	2,00	2,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 6	1,00	2,00	1,50	0,50	0,71	4,00	5,00	4,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71
item 8	1,00	2,00	1,50	0,50	0,71	5,00	4,00	4,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 9	2,00	3,00	2,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 10	3,00	3,00	3,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00
item 11	2,00	3,00	2,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 12	2,00	3,00	2,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
Average scores	1,50	2,00			0,90	3,58	3,50			0,93	1,92	2,00			0,99	3,42	3,75			0,92
Mutuality	1,75					3,54					1,96					3,58				

1st group test	Obs. 1	Obs. 2				Obs. 1	Obs. 2				Obs. 1	Obs. 2				Obs. 1	Obs. 2			
Students	1 $A_{3,5}$	1 $A_{3,5}$	average	variance	a_{wg}	2 $A_{3,5}$	2 $A_{3,5}$	average	variance	a_{wg}	3 $A_{3,5}$	3 $A_{3,5}$	average	variance	a_{wg}	4 $A_{3,5}$	4 $A_{3,5}$	average	variance	a_{wg}
item 1																				
item 2																				
item 3																				
item 4																				
item 5																				
item 6																				
item 7																				
item 8																				
item 9																				
item 10																				
item 11																				
item 12																				
Average scores																				
Mutuality																				

Activity 8 - Ex. 1-2	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	1 $A_{3,5}$	1 $A_{3,5}$	average	variance	a_{wg}	2 $A_{3,5}$	2 $A_{3,5}$	average	variance	a_{wg}	3 $A_{3,5}$	3 $A_{3,5}$	average	variance	a_{wg}	4 $A_{3,5}$	4 $A_{3,5}$	average	variance	a_{wg}
item 1	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 2	2,00	2,00	2,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 6	3,00	2,00	2,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 7	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 8	2,00	2,00	2,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 9	2,00	3,00	2,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 10	3,00	3,00	3,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71	3,00	4,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00
item 11	2,00	2,00	2,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 12	2,00	2,00	2,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
Average scores	2,00	2,00			0,98	3,25	3,42			0,95	2,08	2,33			0,95	2,83	2,75			0,99
Mutuality	2,00					3,33					2,21					2,79				

2nd group test	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	reader		
Students	1 $A_{3,5}$	1 $A_{3,5}$	average	variance	a_{wg}	2 $A_{3,5}$	2 $A_{3,5}$	average	variance	a_{wg}	3 $A_{3,5}$	3 $A_{3,5}$	average	variance	a_{wg}	4 $A_{3,5}$	4 $A_{3,5}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 3	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 4	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 5	3,00	3,00	3,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00
item 6	4,00	5,00	4,50	0,50	1,00	5,00	5,00	5,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 7	5,00	5,00	5,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	4,00	5,00	4,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00
item 8	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 9	4,00	4,00	4,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 10	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 11	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 12	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
Average scores	3,67	3,92			0,98	3,25	3,33			0,97	3,08	3,25			0,94	3,50	3,67			0,97
Mutuality	3,79					3,29					3,17					3,58				

Activity 1 - Ex. 1-2-3	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	1 $A_{3,6}$	1 $A_{3,6}$	average	variance	a_{wg}	2 $A_{3,6}$	2 $A_{3,6}$	average	variance	a_{wg}	3 $A_{3,6}$	3 $A_{3,6}$	average	variance	a_{wg}	4 $A_{3,6}$	4 $A_{3,6}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87
item 2	2,00	3,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 4	2,00	3,00	2,50	0,50	0,87	1,00	2,00	1,50	0,50	0,71	2,00	3,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	3,00	4,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 6	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	2,00
item 7	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	2,00	1,00	1,50	0,50	0,71
item 8	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	2,00	1,00	1,50	0,50	0,71
item 9	2,00	3,00	2,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
item 10	3,00	4,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87
item 11	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 12	3,00	3,00	3,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
Average scores	2,17	2,58			0,94	1,75	2,08			0,93	3,17	3,25			0,91	2,50	2,17			0,99
Mutuality	2,38					1,92					3,21					2,33				

Activity 1 - Ex. 4-5-6-7	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	1 $A_{3,6}$	1 $A_{3,6}$	average	variance	a_{wg}	2 $A_{3,6}$	2 $A_{3,6}$	average	variance	a_{wg}	3 $A_{3,6}$	3 $A_{3,6}$	average	variance	a_{wg}	4 $A_{3,6}$	4 $A_{3,6}$	average	variance	a_{wg}
item 1	2,00	1,00	1,50	0,50	0,71	3,00	4,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 2	3,00	4,00	3,50	0,50	0,87	4,00	5,00	4,50	0,50	0,71	3,00	4,00	3,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87
item 3	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 4	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	3,00	4,00	3,50	0,50	0,87
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 6	4,00	5,00	4,50	0,50	0,71	4,00	5,00	4,50	0,50	0,71	3,00	4,00	3,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87
item 7	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	2,00	1,00	1,50	0,50	0,71	4,00	4,00	4,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	2,00	1,00	1,50	0,50	0,71
item 9	4,00	3,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 10	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 11	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 12	2,00	3,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	1,00	2,00	1,50	0,50	0,71
Average scores	2,67	2,58			0,88	2,75	3,00			0,94	2,50	3,00			0,90	1,58	2,00			0,88
Mutuality	2,63					2,88					2,75					1,79				

Activity 2 - Ex. 1-2-3	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	1 $A_{3,6}$	1 $A_{3,6}$	average	variance	a_{wg}	2 $A_{3,6}$	2 $A_{3,6}$	average	variance	a_{wg}	3 $A_{3,6}$	3 $A_{3,6}$	average	variance	a_{wg}	4 $A_{3,6}$	4 $A_{3,6}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	3,00	4,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	1,00	2,00	1,50	0,50	0,71
item 3	1,00	2,00	1,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	2,00	1,00	1,50	0,50	0,71
item 4	3,00	2,00	2,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 5	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	2,00	3,00	2,50	0,50	0,87
item 6	3,00	4,00	3,50	0,50	0,87	4,00	5,00	4,50	0,50	0,71	3,00	4,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 8	3,00	3,00	3,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 9	2,00	3,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 10	4,00	4,00	4,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 11	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
item 12	4,00	3,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87	1,00	2,00	1,50	0,50	0,71
Average scores	2,58	2,75			0,92	3,42	3,00			0,91	2,00	2,17			0,87	1,42	1,58			0,88
Mutuality	2,67					3,21					2,08					1,50				

Activity 2 - Ex. 4	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	1 $A_{3,6}$	1 $A_{3,6}$	average	variance	a_{wg}	2 $A_{3,6}$	2 $A_{3,6}$	average	variance	a_{wg}	3 $A_{3,6}$	3 $A_{3,6}$	average	variance	a_{wg}	4 $A_{3,6}$	4 $A_{3,6}$	average	variance	a_{wg}
item 1	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	4,00	3,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87	5,00	4,00	4,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 6	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 7	3,00	3,00	3,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
item 8	2,00	1,00	1,50	0,50	0,71	3,00	2,00	2,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 9	4,00	4,00	4,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 10	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 11	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 12	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
Average scores	2,83	2,67			0,97	2,33	2,25			0,92	3,17	2,75			0,88	1,17	1,25			0,94
Mutuality	2,75					2,29					2,96					1,21				

1st group test	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter		
Students	1 $A_{3,6}$	1 $A_{3,6}$	average	variance	a_{wg}	2 $A_{3,6}$	2 $A_{3,6}$	average	variance	a_{wg}	3 $A_{3,6}$	3 $A_{3,6}$	average	variance	a_{wg}	4 $A_{3,6}$	4 $A_{3,6}$	average	variance	a_{wg}
item 1	2,00	3,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87
item 2	3,00	4,00	3,50	0,50	0,87	4,00	5,00	4,50	0,50	0,71	3,00	4,00	3,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	3,00	2,00	2,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87	4,00	2,00	3,00	2,00	0,50	3,00	3,00	3,00	0,00	1,00
item 6	4,00	5,00	4,50	0,50	0,71	4,00	3,00	3,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87	3,00	1,00	2,00	2,00	0,33
item 7	3,00	3,00	3,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	3,00	5,00	4,00	2,00	0,33	3,00	3,00	3,00	0,00	1,00
item 8	4,00	3,00	3,50	0,50	0,87	5,00	4,00	4,50	0,50	0,71	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 9	5,00	4,00	4,50	0,50	0,71	5,00	4,00	4,50	0,50	0,71	2,00	3,00	2,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87
item 10	5,00	5,00	5,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 11	4,00	5,00	4,50	0,50	0,71	5,00	4,00	4,50	0,50	0,71	3,00	3,00	3,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87
item 12	5,00	4,00	4,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
Average scores	3,33	3,33			0,86	3,50	3,42			0,87	2,67	3,00			0,86	2,58	2,83			0,89
Mutuality	3,33					3,46					2,83					2,71				

Activity 8 - Ex. 1-2	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	1 $A_{3,6}$	1 $A_{3,6}$	average	variance	a_{wg}	2 $A_{3,6}$	2 $A_{3,6}$	average	variance	a_{wg}	3 $A_{3,6}$	3 $A_{3,6}$	average	variance	a_{wg}	4 $A_{3,6}$	4 $A_{3,6}$	average	variance	a_{wg}
item 1	4,00	4,00	4,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	5,00	4,00	4,50	0,50	0,71	2,00	3,00	2,50	0,50	0,87
item 2	5,00	4,00	4,50	0,50	0,71	5,00	4,00	4,50	0,50	0,71	4,00	3,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87
item 4	4,00	4,00	4,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 6	5,00	5,00	5,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71	3,00	4,00	3,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87
item 7	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	2,00	1,00	1,50	0,50	0,71	3,00	3,00	3,00	0,00	1,00
item 8	3,00	2,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 9	3,00	3,00	3,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	2,00	1,00	1,50	0,50	0,71	3,00	2,00	2,50	0,50	0,87
item 10	5,00	4,00	4,50	0,50	0,71	5,00	4,00	4,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 11	5,00	4,00	4,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 12	5,00	4,00	4,50	0,50	0,71	5,00	4,00	4,50	0,50	0,71	3,00	4,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
Average scores	3,50	3,08			0,89	3,50	3,00			0,85	2,58	2,33			0,85	2,67	2,83			0,96
Mutuality	3,29					3,25					2,46					2,75				

2nd group test	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	reader		
Students	1 $A_{3,6}$	1 $A_{3,6}$	average	variance	a_{wg}	2 $A_{3,6}$	2 $A_{3,6}$	average	variance	a_{wg}	3 $A_{3,6}$	3 $A_{3,6}$	average	variance	a_{wg}	4 $A_{3,6}$	4 $A_{3,6}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87
item 2	4,00	4,00	4,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	5,00	4,00	4,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	2,00	3,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 6	4,00	5,00	4,50	0,50	0,71	1,00	2,00	1,50	0,50	0,71	1,00	2,00	1,50	0,50	0,71	4,00	5,00	4,50	0,50	0,71
item 7	1,00	1,00	1,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 8	4,00	5,00	4,50	0,50	0,71	3,00	4,00	3,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 9	4,00	5,00	4,50	0,50	0,71	2,00	3,00	2,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71
item 10	4,00	5,00	4,50	0,50	0,71	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71
item 11	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71	5,00	4,00	4,50	0,50	0,71
item 12	4,00	4,00	4,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
Average scores	2,83	3,25			0,89	2,33	2,83			0,90	3,17	3,00			0,92	3,17	3,58			0,86
Mutuality	3,04					2,58					3,08					3,38				

Activity 1 - Ex. 1-2-3	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	presenter		
Students	1 $A_{3,7}$	1 $A_{3,7}$	average	variance	a_{wg}	2 $A_{3,7}$	2 $A_{3,7}$	average	variance	a_{wg}	3 $A_{3,7}$	3 $A_{3,7}$	average	variance	a_{wg}
item 1	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 2	4,00	4,00	4,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87
item 3	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 5	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 6	4,00	3,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87
item 7	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	4,00	4,00	4,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00
item 9	4,00	4,00	4,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71	4,00	5,00	4,50	0,50	0,71
item 10	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 11	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 12	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
Average scores	3,42	3,33			0,95	3,08	3,42			0,92	3,00	3,33			0,94
Mutuality	3,38					3,25					3,17				

Activity 1 - Ex. 4-5-6-7	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	presenter		
Students	1 $A_{3,7}$	1 $A_{3,7}$	average	variance	a_{wg}	2 $A_{3,7}$	2 $A_{3,7}$	average	variance	a_{wg}	3 $A_{3,7}$	3 $A_{3,7}$	average	variance	a_{wg}
item 1	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 2	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 4	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	4,00	5,00	4,50	0,50	0,71	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 6	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 7	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 8	5,00	5,00	5,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 9	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 10	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 11	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 12	5,00	4,00	4,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
Average scores	4,08	4,00			0,93	3,75	3,75			1,00	4,17	4,17			1,00
Mutuality	4,04					3,75					4,17				

Activity 2 - Ex. 1-2-3	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	presenter		
Students	1 $A_{3,7}$	1 $A_{3,7}$	average	variance	a_{wg}	2 $A_{3,7}$	2 $A_{3,7}$	average	variance	a_{wg}	3 $A_{3,7}$	3 $A_{3,7}$	average	variance	a_{wg}
item 1	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 2	4,00	5,00	4,50	0,50	0,71	4,00	4,00	4,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87
item 3	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 7	4,00	5,00	4,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 8	5,00	5,00	5,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00
item 9	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 10	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 11	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87
item 12	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
Average scores	3,67	4,00			0,92	3,33	3,42			0,99	2,67	2,83			0,98
Mutuality	3,83					3,38					2,75				

Activity 2 - Ex. 4	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	presenter		
Students	1 $A_{3,7}$	1 $A_{3,7}$	average	variance	a_{wg}	2 $A_{3,7}$	2 $A_{3,7}$	average	variance	a_{wg}	3 $A_{3,7}$	3 $A_{3,7}$	average	variance	a_{wg}
item 1	4,00	5,00	4,50	0,50	0,71	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 2	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71
item 3	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	2,00	3,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 7	5,00	5,00	5,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 8	2,00	3,00	2,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 9	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 10	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 11	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87
item 12	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
Average scores	3,42	3,75			0,93	3,42	3,42			1,00	2,75	2,92			0,93
Mutuality	3,58					3,42					2,83				

1st group test	Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter		
Students	1 $A_{3,7}$	1 $A_{3,7}$	average	variance	a_{wg}	2 $A_{3,7}$	2 $A_{3,7}$	average	variance	a_{wg}	3 $A_{3,7}$	3 $A_{3,7}$	average	variance	a_{wg}
item 1	5,00	5,00	5,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71	4,00	4,00	4,00	0,00	1,00
item 2	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 7	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 8	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 9	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 10	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 11	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71
item 12	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
Average scores	3,75	3,75			1,00	4,00	3,83			0,97	3,25	3,42			0,97
Mutuality	3,75					3,92					3,33				

Activity 8 - Ex. 1-2	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	presenter		
Students	1 $A_{3,7}$	1 $A_{3,7}$	average	variance	a_{wg}	2 $A_{3,7}$	2 $A_{3,7}$	average	variance	a_{wg}	3 $A_{3,7}$	3 $A_{3,7}$	average	variance	a_{wg}
item 1	5,00	5,00	5,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00
item 2	5,00	5,00	5,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 6	5,00	5,00	5,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00
item 7	2,00	3,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71
item 8	5,00	5,00	5,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00
item 9	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 10	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 11	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 12	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
Average scores	3,83	3,92			0,99	3,42	3,83			0,91	3,92	4,00			0,98
Mutuality	3,88					3,63					3,96				

2nd group test	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader-mediator		
Students	1 $A_{3,7}$	1 $A_{3,7}$	average	variance	a_{wg}	2 $A_{3,7}$	2 $A_{3,7}$	average	variance	a_{wg}	3 $A_{3,7}$	3 $A_{3,7}$	average	variance	a_{wg}
item 1	5,00	5,00	5,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71	4,00	5,00	4,50	0,50	0,71
item 2	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	4,00	3,00	3,50	0,50	0,87	1,00	2,00	1,50	0,50	0,71	2,00	3,00	2,50	0,50	0,87
item 7	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 8	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 9	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 10	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 11	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 12	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
Average scores	3,58	3,50			0,99	3,33	3,50			0,95	3,42	3,58			0,97
Mutuality	3,54					3,42					3,50				

Appendix D.2.2: Observation protocols of the mutuality parameter - Class B_3

Activity 1 - Ex. 1-2-3	Obs. 1	Obs. 2				Obs. 1	Obs. 2				Obs. 1	Obs. 2				Obs. 1	Obs. 2			
Students	**1 $B_{3,1}$**	**1 $B_{3,1}$**	**average**	**variance**	**a_{wg}**	**2 $B_{3,1}$**	**2 $B_{3,1}$**	**average**	**variance**	**a_{wg}**	**3 $B_{3,1}$**	**3 $B_{3,1}$**	**average**	**variance**	**a_{wg}**	**4 $B_{3,1}$**	**4 $B_{3,1}$**	**average**	**variance**	**a_{wg}**
item 1																				
item 2																				
item 3																				
item 4																				
item 5																				
item 6																				
item 7																				
item 8																				
item 9																				
item 10																				
item 11																				
item 12																				
Average scores																				
Mutuality																				

Activity 1 - Ex. 4-5-6-7	Obs. 1	Obs. 2				Obs. 1	Obs. 2				Obs. 1	Obs. 2				Obs. 1	Obs. 2			
Students	**1 $B_{3,1}$**	**1 $B_{3,1}$**	**average**	**variance**	**a_{wg}**	**2 $B_{3,1}$**	**2 $B_{3,1}$**	**average**	**variance**	**a_{wg}**	**3 $B_{3,1}$**	**3 $B_{3,1}$**	**average**	**variance**	**a_{wg}**	**4 $B_{3,1}$**	**4 $B_{3,1}$**	**average**	**variance**	**a_{wg}**
item 1																				
item 2																				
item 3																				
item 4																				
item 5																				
item 6																				
item 7																				
item 8																				
item 9																				
item 10																				
item 11																				
item 12																				
Average scores																				
Mutuality																				

Activity 2 - Ex. 1-2-3	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	**1 $B_{3,1}$**	**1 $B_{3,1}$**	**average**	**variance**	**a_{wg}**	**2 $B_{3,1}$**	**2 $B_{3,1}$**	**average**	**variance**	**a_{wg}**	**3 $B_{3,1}$**	**3 $B_{3,1}$**	**average**	**variance**	**a_{wg}**	**4 $B_{3,1}$**	**4 $B_{3,1}$**	**average**	**variance**	**a_{wg}**
item 1	3,00	3,00	3,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71
item 2	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87
item 5	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
item 6	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 8	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	2,00	1,00	1,50	0,50	0,71
item 9	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	4,00	3,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 10	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 11	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87
item 12	2,00	2,00	2,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
Average scores	1,75	1,75			1,00	2,00	1,83			0,93	2,92	3,00			0,97	3,08	3,00			0,88
Mutuality	1,75					1,92					2,96					3,04				

Activity 2 - Ex. 4	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	**1 $B_{3,1}$**	**1 $B_{3,1}$**	**average**	**variance**	**a_{wg}**	**2 $B_{3,1}$**	**2 $B_{3,1}$**	**average**	**variance**	**a_{wg}**	**3 $B_{3,1}$**	**3 $B_{3,1}$**	**average**	**variance**	**a_{wg}**	**4 $B_{3,1}$**	**4 $B_{3,1}$**	**average**	**variance**	**a_{wg}**
item 1	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 8	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	2,00	3,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 10	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00
item 11	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00
item 12	2,00	2,00	2,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00
Average scores	1,50	1,58			0,99	1,75	1,58			0,97	2,00	2,33			0,91	1,58	1,67			0,99
Mutuality	1,54					1,67					2,17					1,63				

1st group test	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter		
Students	1 $B_{3,1}$	1 $B_{3,1}$	average	variance	a_{wg}	2 $B_{3,1}$	2 $B_{3,1}$	average	variance	a_{wg}	3 $B_{3,1}$	3 $B_{3,1}$	average	variance	a_{wg}	4 $B_{3,1}$	4 $B_{3,1}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 2	3,00	3,00	3,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 5	2,00	3,00	2,50	0,50	0,87	1,00	2,00	1,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87
item 6	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	5,00	4,00	4,50	0,50	0,71
item 7	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71
item 8	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71
item 9	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 10	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 11	3,00	3,00	3,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 12	3,00	4,00	3,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
Average scores	2,17	2,42			0,95	2,25	2,42			0,94	1,25	1,25			0,95	3,67	3,50			0,88
Mutuality	2,29					2,33					1,25					3,58				

Activity 8 - Ex. 1-2	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	1 $B_{3,1}$	1 $B_{3,1}$	average	variance	a_{wg}	2 $B_{3,1}$	2 $B_{3,1}$	average	variance	a_{wg}	3 $B_{3,1}$	3 $B_{3,1}$	average	variance	a_{wg}	4 $B_{3,1}$	4 $B_{3,1}$	average	variance	a_{wg}
item 1	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 5	1,00	2,00	1,50	0,50	0,71	1,00	2,00	1,50	0,50	0,71	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71	4,00	4,00	4,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 9	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 10	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 11	1,00	2,00	1,50	0,50	0,71	2,00	3,00	2,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 12	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
Average scores	1,33	1,58			0,94	1,83	2,00			0,97	3,17	3,08			0,98	2,17	2,33			0,93
Mutuality	1,46					1,92					3,13					2,25				

2nd group test	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	reader		
Students	1 $B_{3,1}$	1 $B_{3,1}$	average	variance	a_{wg}	2 $B_{3,1}$	2 $B_{3,1}$	average	variance	a_{wg}	3 $B_{3,1}$	3 $B_{3,1}$	average	variance	a_{wg}	4 $B_{3,1}$	4 $B_{3,1}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
item 6	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 7	1,00	2,00	1,50	0,50	0,71	1,00	2,00	1,50	0,50	0,71	1,00	2,00	1,50	0,50	0,71	3,00	4,00	3,50	0,50	0,87
item 8	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71
item 9	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 10	3,00	4,00	3,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 11	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 12	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
Average scores	1,75	2,00			0,92	1,08	1,25			0,97	2,42	2,50			0,98	2,33	2,17			0,93
Mutuality	1,88					1,17					2,46					2,25				

Activity 1 - Ex. 1-2-3	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	1 $B_{3,2}$	1 $B_{3,2}$	average	variance	a_{wg}	2 $B_{3,2}$	2 $B_{3,2}$	average	variance	a_{wg}	3 $B_{3,2}$	3 $B_{3,2}$	average	variance	a_{wg}	4 $B_{3,2}$	4 $B_{3,2}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 2	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00
item 9	5,00	5,00	5,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 10	2,00	3,00	2,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87
item 11	3,00	3,00	3,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 12	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
Average scores	2,42	2,42			0,98	2,00	2,08			0,95	2,50	2,50			0,98	1,58	1,75			0,98
Mutuality	2,42					2,04					2,50					1,67				

Activity 1 - Ex. 4-5-6-7	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	1 $B_{3,2}$	1 $B_{3,2}$	average	variance	a_{wg}	2 $B_{3,2}$	2 $B_{3,2}$	average	variance	a_{wg}	3 $B_{3,2}$	3 $B_{3,2}$	average	variance	a_{wg}	4 $B_{3,2}$	4 $B_{3,2}$	average	variance	a_{wg}
item 1	2,00	3,00	2,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
item 2	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 3	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 6	5,00	4,00	4,50	0,50	0,71	4,00	3,00	3,50	0,50	0,87	5,00	4,00	4,50	0,50	0,71	3,00	3,00	3,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 9	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 10	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 11	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87
item 12	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87
Average scores	2,50	2,50			0,97	2,50	2,50			0,97	2,58	2,42			0,92	2,08	2,33			0,94
Mutuality	2,50					2,50					2,50					2,21				

Activity 2 - Ex. 1-2-3	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	1 $B_{3,2}$	1 $B_{3,2}$	average	variance	a_{wg}	2 $B_{3,2}$	2 $B_{3,2}$	average	variance	a_{wg}	3 $B_{3,2}$	3 $B_{3,2}$	average	variance	a_{wg}	4 $B_{3,2}$	4 $B_{3,2}$	average	variance	a_{wg}
item 1	4,00	3,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 2	5,00	4,00	4,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
item 4	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 6	5,00	5,00	5,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71	4,00	4,00	4,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 8	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 10	3,00	3,00	3,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87
item 11	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87
item 12	4,00	3,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
Average scores	3,25	2,83			0,93	2,17	2,25			0,99	2,67	2,42			0,92	2,08	2,33			0,93
Mutuality	3,04					2,21					2,54					2,21				

Activity 2 - Ex. 4	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2				Obs. 1	Obs. 2	presenter		
Students	1 $B_{3,2}$	1 $B_{3,2}$	average	variance	a_{wg}	2 $B_{3,2}$	2 $B_{3,2}$	average	variance	a_{wg}	3 $B_{3,2}$	3 $B_{3,2}$	average	variance	a_{wg}	4 $B_{3,2}$	4 $B_{3,2}$	average	variance	a_{wg}
item 1	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 2	2,00	3,00	2,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87						3,00	4,00	3,50	0,50	0,87
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						2,00	2,00	2,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00						2,00	1,00	1,50	0,50	0,71
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 6	4,00	3,00	3,50	0,50	0,87	5,00	4,00	4,50	0,50	0,71						5,00	4,00	4,50	0,50	0,71
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 9	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 10	4,00	3,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00						4,00	4,00	4,00	0,00	1,00
item 11	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00						4,00	4,00	4,00	0,00	1,00
item 12	2,00	2,00	2,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87						3,00	3,00	3,00	0,00	1,00
Average scores	2,08	1,92			0,96	2,25	2,33			0,95						2,33	2,25			0,94
Mutuality	2,00					2,29										2,29				

1st group test	Obs. 1	Obs. 2				Obs. 1	Obs. 2				Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	writer-presenter		
Students	1 $B_{3,2}$	1 $B_{3,2}$	average	variance	a_{wg}	2 $B_{3,2}$	2 $B_{3,2}$	average	variance	a_{wg}	3 $B_{3,2}$	3 $B_{3,2}$	average	variance	a_{wg}	4 $B_{3,2}$	4 $B_{3,2}$	average	variance	a_{wg}
item 1											3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 2											4,00	5,00	4,50	0,50	0,71	4,00	5,00	4,50	0,50	0,71
item 3											1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4											1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5											1,00	2,00	1,50	0,50	0,71	1,00	2,00	1,50	0,50	0,71
item 6											5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 7											2,00	3,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 8											5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 9											5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 10											5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 11											5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 12											5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
Average scores											3,50	3,75			0,94	3,58	3,75			0,95
Mutuality											3,63					3,67				

Activity 8 - Ex. 1-2	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2			
Students	1 $B_{3,2}$	1 $B_{3,2}$	average	variance	a_{wg}	2 $B_{3,2}$	2 $B_{3,2}$	average	variance	a_{wg}	3 $B_{3,2}$	3 $B_{3,2}$	average	variance	a_{wg}	4 $B_{3,2}$	4 $B_{3,2}$	average	variance	a_{wg}
item 1	2,00	2,00	2,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87					
item 2	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 4	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 5	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 6	3,00	4,00	3,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87					
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 9	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 10	3,00	2,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87					
item 11	3,00	4,00	3,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00					
item 12	3,00	3,00	3,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00					
Average scores	2,00	2,17			0,94	1,92	2,08			0,96	1,75	1,67			0,97					
Mutuality	2,08					2,00					1,71									

2nd group test	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	reader		
Students	1 $B_{3,2}$	1 $B_{3,2}$	average	variance	a_{wg}	2 $B_{3,2}$	2 $B_{3,2}$	average	variance	a_{wg}	3 $B_{3,2}$	3 $B_{3,2}$	average	variance	a_{wg}	4 $B_{3,2}$	4 $B_{3,2}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	5,00	4,00	4,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	2,00	3,00	2,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 6	1,00	2,00	1,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 7	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	4,00	5,00	4,50	0,50	0,71
item 8	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00
item 9	5,00	4,00	4,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 10	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00
item 11	5,00	4,00	4,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 12	5,00	4,00	4,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00
Average scores	3,25	3,08			0,87	3,50	3,58			0,99	3,25	3,33			0,92	3,75	3,83			0,98
Mutuality	3,17					3,54					3,29					3,79				

Activity 1 - Ex. 1-2-3	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	1 $B_{3,3}$	1 $B_{3,3}$	average	variance	a_{wg}	2 $B_{3,3}$	2 $B_{3,3}$	average	variance	a_{wg}	3 $B_{3,3}$	3 $B_{3,3}$	average	variance	a_{wg}	4 $B_{3,3}$	4 $B_{3,3}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	4,00	4,00	4,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 10	1,00	2,00	1,50	0,50	0,71	2,00	3,00	2,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 11	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	4,00	5,00	4,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00
item 12	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
Average scores	1,00	1,08			0,98	1,17	1,58			0,91	3,25	3,33			0,94	3,33	3,50			0,97
Mutuality	1,04					1,38					3,29					3,42				

Activity 1 - Ex. 4-5-6-7	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	1 $B_{3,3}$	1 $B_{3,3}$	average	variance	a_{wg}	2 $B_{3,3}$	2 $B_{3,3}$	average	variance	a_{wg}	3 $B_{3,3}$	3 $B_{3,3}$	average	variance	a_{wg}	4 $B_{3,3}$	4 $B_{3,3}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71	5,00	5,00	5,00	0,00	#####	5,00	5,00	5,00	0,00	1,00
item 2	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 3	1,00	2,00	1,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	1,00	2,00	1,50	0,50	0,71	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87
item 9	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 10	2,00	3,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00
item 11	2,00	2,00	2,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00
item 12	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
Average scores	1,50	1,67			0,92	2,33	2,50			0,97	2,33	2,58			#####	3,58	3,67			0,99
Mutuality	1,58					2,42					2,46					3,63				

Activity 2 - Ex. 1-2-3	Obs. 1	Obs. 2				Obs. 1	Obs. 2				Obs. 1	Obs. 2	writer-presenter			Obs. 1	Obs. 2	reader-mediator		
Students	1 $B_{3,3}$	1 $B_{3,3}$	average	variance	a_{wg}	2 $B_{3,3}$	2 $B_{3,3}$	average	variance	a_{wg}	3 $B_{3,3}$	3 $B_{3,3}$	average	variance	a_{wg}	4 $B_{3,3}$	4 $B_{3,3}$	average	variance	a_{wg}
item 1											4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 2											4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 3											1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4											1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5											2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6											4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 7											1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 8											2,00	3,00	2,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00
item 9											4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 10											4,00	5,00	4,50	0,50	0,71	4,00	5,00	4,50	0,50	0,71
item 11											3,00	4,00	3,50	0,50	0,87	4,00	5,00	4,50	0,50	0,71
item 12											5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
Average scores											2,92	3,17			0,95	3,42	3,58			0,95
Mutuality											3,04					3,50				

Activity 2 - Ex. 4	Obs. 1	Obs. 2				Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer		
Students	1 $B_{3,3}$	1 $B_{3,3}$	average	variance	a_{wg}	2 $B_{3,3}$	2 $B_{3,3}$	average	variance	a_{wg}	3 $B_{3,3}$	3 $B_{3,3}$	average	variance	a_{wg}	4 $B_{3,3}$	4 $B_{3,3}$	average	variance	a_{wg}
item 1						3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 2						1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 3						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 5						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6						1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	3,00	4,00	3,50	0,50	0,87
item 7						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 9						1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00
item 10						2,00	3,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87
item 11						1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	4,00	5,00	4,50	0,50	0,71
item 12						1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
Average scores						1,25	1,33			0,99	1,50	1,75			0,95	2,92	3,25			0,93
Mutuality						1,29					1,63					3,08				

1st group test	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter		
Students	1 $B_{3,3}$	1 $B_{3,3}$	average	variance	a_{wg}	2 $B_{3,3}$	2 $B_{3,3}$	average	variance	a_{wg}	3 $B_{3,3}$	3 $B_{3,3}$	average	variance	a_{wg}	4 $B_{3,3}$	4 $B_{3,3}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	4,00	3,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 7	3,00	2,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	2,00	2,00	2,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00
item 9	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71	5,00	4,00	4,50	0,50	0,71
item 10	3,00	3,00	3,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 11	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	5,00	4,50	0,50	1,00	5,00	5,00	5,00	0,00	1,00
item 12	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71
Average scores	2,00	1,83			0,98	2,25	2,33			0,97	3,50	3,33			0,94	3,33	3,17			0,95
Mutuality	1,92					2,29					3,42					3,25				

Activity 8 - Ex. 1-2	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	1 $B_{3,3}$	1 $B_{3,3}$	average	variance	a_{wg}	2 $B_{3,3}$	2 $B_{3,3}$	average	variance	a_{wg}	3 $B_{3,3}$	3 $B_{3,3}$	average	variance	a_{wg}	4 $B_{3,3}$	4 $B_{3,3}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 2	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 3	2,00	2,00	2,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00
item 5	4,00	3,00	3,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87
item 9	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00
item 10	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 11	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00
item 12	2,00	3,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
Average scores	1,75	1,75			0,98	2,58	2,42			0,98	2,17	2,25			0,95	3,83	3,92			0,99
Mutuality	1,75					2,50					2,21					3,88				

2nd group test	Obs. 1	Obs. 2				Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader-mediator		
Students	1 $B_{3,3}$	1 $B_{3,3}$	average	variance	a_{wg}	2 $B_{3,3}$	2 $B_{3,3}$	average	variance	a_{wg}	3 $B_{3,3}$	3 $B_{3,3}$	average	variance	a_{wg}	4 $B_{3,3}$	4 $B_{3,3}$	average	variance	a_{wg}
item 1						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2						4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 3						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5						1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 6						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 7						2,00	3,00	2,50	0,50	0,87	1,00	2,00	1,50	0,50	0,71	5,00	4,00	4,50	0,50	0,71
item 8						4,00	4,00	4,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00
item 9						4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 10						4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 11						3,00	4,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 12						4,00	4,00	4,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00
Average scores						2,50	2,67			0,98	2,33	2,58			0,95	3,75	3,67			0,98
Mutuality						2,58					2,46					3,71				

Activity 1 - Ex. 1-2-3	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	1 $B_{3,4}$	1 $B_{3,4}$	average	variance	a_{wg}	2 $B_{3,4}$	2 $B_{3,4}$	average	variance	a_{wg}	3 $B_{3,4}$	3 $B_{3,4}$	average	variance	a_{wg}	4 $B_{3,4}$	4 $B_{3,4}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 6	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 9	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87
item 10	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71
item 11	2,00	1,00	1,50	0,50	0,71	3,00	2,00	2,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00
item 12	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00
Average scores	1,17	1,08			0,98	1,67	1,50			0,97	2,42	2,58			0,94	2,83	3,08			0,95
Mutuality	1,13					1,58					2,50					2,96				

Activity 1 - Ex. 4-5-6-7	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	1 $B_{3,4}$	1 $B_{3,4}$	average	variance	a_{wg}	2 $B_{3,4}$	2 $B_{3,4}$	average	variance	a_{wg}	3 $B_{3,4}$	3 $B_{3,4}$	average	variance	a_{wg}	4 $B_{3,4}$	4 $B_{3,4}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	3,00	3,00	3,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
item 2	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
item 5	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 6	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	2,00	3,00	2,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87
item 10	2,00	3,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 11	2,00	3,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 12	2,00	3,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
Average scores	1,50	1,83			0,96	1,67	1,92			0,94	2,08	2,17			0,99	2,33	2,33			0,94
Mutuality	1,67					1,79					2,13					2,33				

Activity 2 - Ex. 1-2-3	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	1 $B_{3,4}$	1 $B_{3,4}$	average	variance	a_{wg}	2 $B_{3,4}$	2 $B_{3,4}$	average	variance	a_{wg}	3 $B_{3,4}$	3 $B_{3,4}$	average	variance	a_{wg}	4 $B_{3,4}$	4 $B_{3,4}$	average	variance	a_{wg}
item 1	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	#####	4,00	4,00	4,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	2,00	1,00	1,50	0,50	0,71
item 4	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 5	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	2,00	1,00	1,50	0,50	0,71	3,00	4,00	3,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00
item 7	1,00	2,00	1,50	0,50	0,71	1,00	2,00	1,50	0,50	0,71	1,00	2,00	1,50	0,50	0,71	1,00	2,00	1,50	0,50	0,71
item 8	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 9	2,00	3,00	2,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00
item 10	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 11	1,00	1,00	1,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87	5,00	4,00	4,50	0,50	0,71
item 12	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71
Average scores	1,50	1,58			0,94	2,92	3,25			0,93	2,33	2,83			#####	3,67	3,58			0,88
Mutuality	1,54					3,08					2,58					3,63				

Activity 2 - Ex. 4	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	1 $B_{3,4}$	1 $B_{3,4}$	average	variance	a_{wg}	2 $B_{3,4}$	2 $B_{3,4}$	average	variance	a_{wg}	3 $B_{3,4}$	3 $B_{3,4}$	average	variance	a_{wg}	4 $B_{3,4}$	4 $B_{3,4}$	average	variance	a_{wg}
item 1	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
item 7	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87	1,00	2,00	1,50	0,50	0,71
item 8	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71
item 9	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 10	2,00	3,00	2,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00
item 11	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 12	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71
Average scores	1,17	1,25			0,99	2,17	2,00			0,98	1,92	1,75			0,98	3,42	3,25			0,87
Mutuality	1,21					2,08					1,83					3,33				

1st group test	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter		
Students	1 $B_{3,4}$	1 $B_{3,4}$	average	variance	a_{wg}	2 $B_{3,4}$	2 $B_{3,4}$	average	variance	a_{wg}	3 $B_{3,4}$	3 $B_{3,4}$	average	variance	a_{wg}	4 $B_{3,4}$	4 $B_{3,4}$	average	variance	a_{wg}
item 1	3,00	4,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87
item 2	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 6	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 9	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 10	4,00	5,00	4,50	0,50	0,71	4,00	5,00	4,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 11	2,00	3,00	2,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 12	2,00	3,00	2,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71
Average scores	1,92	2,25			0,94	2,75	2,92			0,97	3,92	4,00			0,98	3,75	4,00			0,95
Mutuality	2,08					2,83					3,96					3,88				

Activity 8 - Ex. 1-2	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator		
Students	1 $B_{3,4}$	1 $B_{3,4}$	average	variance	a_{wg}	2 $B_{3,4}$	2 $B_{3,4}$	average	variance	a_{wg}	3 $B_{3,4}$	3 $B_{3,4}$	average	variance	a_{wg}	4 $B_{3,4}$	4 $B_{3,4}$	average	variance	a_{wg}
item 1	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87
item 2	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87
item 5	1,00	1,00	1,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 6	2,00	2,00	2,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	2,00	4,00	3,00	2,00	0,50	4,00	3,00	3,50	0,50	0,87
item 7	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 9	3,00	3,00	3,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87
item 10	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 11	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 12	3,00	4,00	3,50	0,50	0,87	4,00	5,00	4,50	0,50	0,71	4,00	5,00	4,50	0,50	0,71	4,00	5,00	4,50	0,50	0,71
Average scores	1,92	2,00			0,99	3,08	3,17			0,92	2,67	3,17			0,90	3,50	3,50			0,92
Mutuality	1,96					3,13					2,92					3,50				

2nd group test	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	reader		
Students	1 $B_{3,4}$	1 $B_{3,4}$	average	variance	a_{wg}	2 $B_{3,4}$	2 $B_{3,4}$	average	variance	a_{wg}	3 $B_{3,4}$	3 $B_{3,4}$	average	variance	a_{wg}	4 $B_{3,4}$	4 $B_{3,4}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	3,00	3,00	3,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
item 6	3,00	2,00	2,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 7	4,00	3,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87
item 8	5,00	4,00	4,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 9	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 10	3,00	4,00	3,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 11	4,00	3,00	3,50	0,50	0,87	5,00	4,00	4,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 12	3,00	3,00	3,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
Average scores	2,67	2,42			0,93	3,42	3,25			0,93	3,58	3,50			0,99	3,75	3,58			0,98
Mutuality	2,54					3,33					3,54					3,67				

Activity 1 - Ex. 1-2-3	Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer		
Students	1 $B_{3,5}$	1 $B_{3,5}$	average	variance	a_{wg}	2 $B_{3,5}$	2 $B_{3,5}$	average	variance	a_{wg}	3 $B_{3,4}$	3 $B_{3,4}$	average	variance	a_{wg}
item 1	5,00	5,00	5,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 2	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 5	2,00	2,00	2,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 6	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 9	5,00	5,00	5,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 10	5,00	5,00	5,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 11	3,00	4,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71
item 12	4,00	3,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
Average scores	2,75	2,75			0,98	2,42	2,58			0,95	3,08	3,25			0,97
Mutuality	2,75					2,50					3,17				

Activity 1 - Ex. 4-5-6-7	Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer		
Students	1 $B_{3,5}$	1 $B_{3,5}$	average	variance	a_{wg}	2 $B_{3,5}$	2 $B_{3,5}$	average	variance	a_{wg}	3 $B_{3,4}$	3 $B_{3,4}$	average	variance	a_{wg}
item 1	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 2	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 6	2,00	3,00	2,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87
item 9	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 10	4,00	3,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87
item 11	2,00	3,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 12	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
Average scores	2,00	2,08			0,97	2,67	2,75			0,95	2,92	2,92			0,98
Mutuality	2,04					2,71					2,92				

Activity 2 - Ex. 1-2-3	Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer		
Students	1 $B_{3,5}$	1 $B_{3,5}$	average	variance	a_{wg}	2 $B_{3,5}$	2 $B_{3,5}$	average	variance	a_{wg}	3 $B_{3,4}$	3 $B_{3,4}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
item 2	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 6	4,00	3,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71
item 7	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	4,00	3,00	3,50	0,50	0,87
item 9	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 10	3,00	2,00	2,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87
item 11	2,00	3,00	2,50	0,50	0,87	2,00	1,00	1,50	0,50	0,71	3,00	2,00	2,50	0,50	0,87
item 12	3,00	2,00	2,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
Average scores	1,83	1,67			0,96	2,08	1,83			0,91	2,67	2,25			0,93
Mutuality	1,75					1,96					2,46				

Activity 2 - Ex. 4	Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer		
Students	1 $B_{3,5}$	1 $B_{3,5}$	average	variance	a_{wg}	2 $B_{3,5}$	2 $B_{3,5}$	average	variance	a_{wg}	3 $B_{3,4}$	3 $B_{3,4}$	average	variance	a_{wg}
item 1	1,00	2,00	1,50	0,50	0,71	4,00	3,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87
item 2	2,00	2,00	2,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	2,00	2,00	2,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	2,00	1,00	1,50	0,50	0,71
item 9	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 10	2,00	3,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 11	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 12	2,00	3,00	2,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
Average scores	1,58	1,92			0,94	2,25	1,83			0,93	2,42	2,25			0,97
Mutuality	1,75					2,04					2,33				

1st group test	Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter		
Students	1 $B_{3,5}$	1 $B_{3,5}$	average	variance	a_{wg}	2 $B_{3,5}$	2 $B_{3,5}$	average	variance	a_{wg}	3 $B_{3,4}$	3 $B_{3,4}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 2	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87
item 6	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 9	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 10	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 11	2,00	3,00	2,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87	5,00	4,00	4,50	0,50	0,71
item 12	4,00	4,00	4,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00
Average scores	2,00	2,08			0,99	2,67	2,42			0,97	3,67	3,50			0,97
Mutuality	2,04					2,54					3,58				

Activity 8 - Ex. 1-2	Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2				Obs. 1	Obs. 2	writer-presenter		
Students	1 $B_{3,5}$	1 $B_{3,5}$	average	variance	a_{wg}	2 $B_{3,5}$	2 $B_{3,5}$	average	variance	a_{wg}	3 $B_{3,4}$	3 $B_{3,4}$	average	variance	a_{wg}
item 1	3,00	3,00	3,00	0,00	1,00						4,00	4,00	4,00	0,00	1,00
item 2	4,00	3,00	3,50	0,50	0,87						5,00	4,00	4,50	0,50	0,71
item 3	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 6	4,00	3,00	3,50	0,50	0,87						5,00	5,00	5,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 8	2,00	2,00	2,00	0,00	1,00						5,00	4,00	4,50	0,50	0,71
item 9	4,00	4,00	4,00	0,00	1,00						5,00	5,00	5,00	0,00	1,00
item 10	4,00	4,00	4,00	0,00	1,00						5,00	5,00	5,00	0,00	1,00
item 11	4,00	4,00	4,00	0,00	1,00						5,00	5,00	5,00	0,00	1,00
item 12	4,00	4,00	4,00	0,00	1,00						4,00	4,00	4,00	0,00	1,00
Average scores	2,75	2,58			0,98						3,50	3,33			0,95
Mutuality	2,67										3,42				

2nd group test	Obs. 1	Obs. 2				Obs. 1	Obs. 2				Obs. 1	Obs. 2			
Students	1 $B_{3,5}$	1 $B_{3,5}$	average	variance	a_{wg}	2 $B_{3,5}$	2 $B_{3,5}$	average	variance	a_{wg}	3 $B_{3,4}$	3 $B_{3,4}$	average	variance	a_{wg}
item 1															
item 2															
item 3															
item 4															
item 5															
item 6															
item 7															
item 8															
item 9															
item 10															
item 11															
item 12															
Average scores															
Mutuality															

Activity 1 - Ex. 1-2-3	Obs. 1	Obs. 2				Obs. 1	Obs. 2				Obs. 1	Obs. 2			
Students	1 $B_{3,6}$	1 $B_{3,6}$	average	variance	a_{wg}	2 $B_{3,6}$	2 $B_{3,6}$	average	variance	a_{wg}	3 $B_{3,6}$	3 $B_{3,6}$	average	variance	a_{wg}
item 1															
item 2															
item 3															
item 4															
item 5															
item 6															
item 7															
item 8															
item 9															
item 10															
item 11															
item 12															
Average scores															
Mutuality															

Activity 1 - Ex. 4-5-6-7	Obs. 1	Obs. 2				Obs. 1	Obs. 2				Obs. 1	Obs. 2			
Students	1 $B_{3,6}$	1 $B_{3,6}$	average	variance	a_{wg}	2 $B_{3,6}$	2 $B_{3,6}$	average	variance	a_{wg}	3 $B_{3,6}$	3 $B_{3,6}$	average	variance	a_{wg}
item 1															
item 2															
item 3															
item 4															
item 5															
item 6															
item 7															
item 8															
item 9															
item 10															
item 11															
item 12															
Average scores															
Mutuality															

Activity 2 - Ex. 1-2-3	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	reader-mediator		
Students	1 $B_{3,6}$	1 $B_{3,6}$	average	variance	a_{wg}	2 $B_{3,6}$	2 $B_{3,6}$	average	variance	a_{wg}	3 $B_{3,6}$	3 $B_{3,6}$	average	variance	a_{wg}
item 1	5,00	5,00	5,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 2	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	2,00	1,50	0,50	0,71
item 6	5,00	5,00	5,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 7	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00
item 8	5,00	5,00	5,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 9	4,00	3,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 10	5,00	4,00	4,50	0,50	0,71	4,00	3,00	3,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87
item 11	5,00	4,00	4,50	0,50	0,71	4,00	3,00	3,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87
item 12	4,00	4,00	4,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87
Average scores	3,50	3,33			0,93	2,58	2,50			0,93	2,17	2,58			0,93
Mutuality	3,42					2,54					2,38				

Activity 2 - Ex. 4	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	reader-mediator		
Students	1 $B_{3,6}$	1 $B_{3,6}$	average	variance	a_{wg}	2 $B_{3,6}$	2 $B_{3,6}$	average	variance	a_{wg}	3 $B_{3,6}$	3 $B_{3,6}$	average	variance	a_{wg}
item 1	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	5,00	4,00	4,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	5,00	5,00	5,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
item 7	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	4,00	3,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 10	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71
item 11	5,00	5,00	5,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 12	4,00	4,00	4,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
Average scores	3,33	3,17			0,97	2,42	2,42			0,98	2,08	1,92			0,97
Mutuality	3,25					2,42					2,00				

1st group test	Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter		
Students	1 $B_{3,6}$	1 $B_{3,6}$	average	variance	a_{wg}	2 $B_{3,6}$	2 $B_{3,6}$	average	variance	a_{wg}	3 $B_{3,6}$	3 $B_{3,6}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	2,00	1,00	1,00	1,00	0,00	1,00
item 2	3,00	4,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	1,00	2,00	1,50	0,50	0,71
item 6	4,00	3,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 7	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 8	4,00	4,00	4,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00
item 9	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 10	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 11	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71
item 12	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
Average scores	2,75	2,75			0,96	1,50	1,50			1,05	3,25	3,25			0,92
Mutuality	2,75					1,50					3,25				

Activity 8 - Ex. 1-2	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	reader-mediator		
Students	1 $B_{3,6}$	1 $B_{3,6}$	average	variance	a_{wg}	2 $B_{3,6}$	2 $B_{3,6}$	average	variance	a_{wg}	3 $B_{3,6}$	3 $B_{3,6}$	average	variance	a_{wg}
item 1	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 2	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 5	3,00	3,00	3,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 6	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71
item 7	1,00	2,00	1,50	0,50	0,71	2,00	1,00	1,50	0,50	0,71	1,00	2,00	1,50	0,50	0,71
item 8	3,00	4,00	3,50	0,50	0,87	1,00	2,00	1,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00
item 9	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 10	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 11	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 12	4,00	4,00	4,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00
Average scores	3,00	3,17			0,97	1,67	1,83			0,93	2,92	3,08			0,92
Mutuality	3,08					1,75					3,00				

2nd group test	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader-mediator		
Students	1 $B_{3,6}$	1 $B_{3,6}$	average	variance	a_{wg}	2 $B_{3,6}$	2 $B_{3,6}$	average	variance	a_{wg}	3 $B_{3,6}$	3 $B_{3,6}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	5,00	5,00	5,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	3,00	4,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 6	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71
item 7	5,00	5,00	5,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	5,00	4,00	4,50	0,50	0,71
item 8	5,00	5,00	5,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 9	5,00	4,00	4,50	0,50	0,71	2,00	3,00	2,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00
item 10	5,00	5,00	5,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00
item 11	5,00	5,00	5,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00
item 12	5,00	5,00	5,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
Average scores	3,50	3,50			0,97	2,00	2,17			0,96	3,75	3,67			1,00
Mutuality	3,50					2,08					3,71				

Appendix D.2.3: Observation protocols of the mutuality parameter - Class C_3

Activity 1 - Ex. 1-2-3	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer		
Students	1 $C_{3,1}$	1 $C_{3,1}$	average	variance	a_{wg}	2 $C_{3,1}$	2 $C_{3,1}$	average	variance	a_{wg}	3 $C_{3,2}$	3 $C_{3,2}$	average	variance	a_{wg}	4 $C_{3,1}$	4 $C_{3,1}$	average	variance	a_{wg}
item 1	5,00	4,00	4,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71	2,00	1,00	1,50	0,50	0,71
item 2	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 3	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00
item 6	4,00	4,00	4,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
item 8	2,00	1,00	1,50	0,50	0,71	2,00	1,00	1,50	0,50	0,71	2,00	1,00	1,50	0,50	0,71	3,00	2,00	2,50	0,50	0,87
item 9	4,00	3,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 10	5,00	4,00	4,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71
item 11	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 12	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
Average scores	3,17	2,83			0,88	2,83	2,67			0,95	3,08	3,00			0,93	3,17	2,58			0,87
Mutuality	3,00					2,75					3,04					2,88				

Activity 1 - Ex. 4-5-6-7	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer		
Students	1 $C_{3,1}$	1 $C_{3,1}$	average	variance	a_{wg}	2 $C_{3,1}$	2 $C_{3,1}$	average	variance	a_{wg}	3 $C_{3,2}$	3 $C_{3,2}$	average	variance	a_{wg}	4 $C_{3,1}$	4 $C_{3,1}$	average	variance	a_{wg}
item 1	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	4,00	4,00	4,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00
item 3	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	5,00	4,00	4,50	0,50	0,71	3,00	2,00	2,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	3,00	2,00	2,50	0,50	0,87	2,00	1,00	1,50	0,50	0,71	2,00	1,00	1,50	0,50	0,71	1,00	2,00	1,50	0,50	0,71
item 9	4,00	4,00	4,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00
item 10	5,00	4,00	4,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 11	5,00	4,00	4,50	0,50	0,71	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 12	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
Average scores	3,17	2,83			0,92	2,83	2,67			0,91	2,83	2,92			0,92	2,17	2,08			0,95
Mutuality	3,00					2,75					2,88					2,13				

Activity 2 - Ex. 1-2-3	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer		
Students	1 $C_{3,1}$	1 $C_{3,1}$	average	variance	a_{wg}	2 $C_{3,1}$	2 $C_{3,1}$	average	variance	a_{wg}	3 $C_{3,2}$	3 $C_{3,2}$	average	variance	a_{wg}	4 $C_{3,1}$	4 $C_{3,1}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 2	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 3	3,00	4,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	1,00	2,00	1,50	0,50	0,71
item 4	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 6	4,00	4,00	4,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71	5,00	4,00	4,50	0,50	0,71	5,00	4,00	4,50	0,50	0,71
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
item 8	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 9	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 10	3,00	4,00	3,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71	4,00	4,00	4,00	0,00	1,00
item 11	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 12	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
Average scores	2,75	2,92			0,98	3,67	3,42			0,91	3,33	3,17			0,93	3,67	3,67			0,92
Mutuality	2,83					3,54					3,25					3,67				

Activity 2 - Ex. 4	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer		
Students	1 $C_{3,1}$	1 $C_{3,1}$	average	variance	a_{wg}	2 $C_{3,1}$	2 $C_{3,1}$	average	variance	a_{wg}	3 $C_{3,2}$	3 $C_{3,2}$	average	variance	a_{wg}	4 $C_{3,1}$	4 $C_{3,1}$	average	variance	a_{wg}
item 1	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 2	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 5	2,00	3,00	2,50	0,50	0,87	1,00	2,00	1,50	0,50	0,71	1,00	2,00	1,50	0,50	0,71	1,00	2,00	1,50	0,50	0,71
item 6	2,00	3,00	2,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87	5,00	4,00	4,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 9	2,00	3,00	2,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
item 10	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 11	2,00	3,00	2,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 12	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
Average scores	2,08	2,42			0,96	2,50	2,75			0,95	2,83	3,08			0,89	2,67	2,58			0,95
Mutuality	2,25					2,63					2,96					2,63				

1st group test	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter		
Students	1 $C_{3,1}$	1 $C_{3,1}$	average	variance	a_{wg}	2 $C_{3,1}$	2 $C_{3,1}$	average	variance	a_{wg}	3 $C_{3,2}$	3 $C_{3,2}$	average	variance	a_{wg}	4 $C_{3,1}$	4 $C_{3,1}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 6	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 7	3,00	2,00	2,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 8	1,00	1,00	1,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 9	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71	3,00	3,00	3,00	0,00	1,00
item 10	1,00	1,00	1,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71
item 11	2,00	1,00	1,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 12	1,00	1,00	1,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71	5,00	4,00	4,50	0,50	0,71	4,00	3,00	3,50	0,50	0,87
Average scores	1,25	1,08			0,97	3,33	3,08			0,94	3,58	3,33			0,94	2,67	2,67			0,92
Mutuality	1,17					3,21					3,46					2,67				

Activity 8 - Ex. 1-2	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer		
Students	1 $C_{3,1}$	1 $C_{3,1}$	average	variance	a_{wg}	2 $C_{3,1}$	2 $C_{3,1}$	average	variance	a_{wg}	3 $C_{3,2}$	3 $C_{3,2}$	average	variance	a_{wg}	4 $C_{3,1}$	4 $C_{3,1}$	average	variance	a_{wg}
item 1	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 3	1,00	2,00	1,50	0,50	0,71	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87
item 5	5,00	4,00	4,50	0,50	0,71	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00
item 7	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 9	3,00	2,00	2,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00
item 10	4,00	3,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 11	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 12	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
Average scores	3,08	2,83			0,92	2,83	2,67			0,98	3,17	2,92			0,97	3,17	2,92			0,97
Mutuality	2,96					2,75					3,04					3,04				

2nd group test	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2			
Students	1 $C_{3,1}$	1 $C_{3,1}$	average	variance	a_{wg}	2 $C_{3,1}$	2 $C_{3,1}$	average	variance	a_{wg}	3 $C_{3,2}$	3 $C_{3,2}$	average	variance	a_{wg}	4 $C_{3,1}$	4 $C_{3,1}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 2	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 5	3,00	2,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 6	2,00	2,00	2,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87					
item 7	3,00	2,00	2,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 8	4,00	4,00	4,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00					
item 9	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 10	4,00	3,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87					
item 11	3,00	2,00	2,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87					
item 12	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87					
Average scores	2,50	2,17			0,96	3,08	2,92			0,98	1,92	1,75			0,96					
Mutuality	2,33					3,00					1,83									

Activity 1 - Ex. 1-2-3	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer		
Students	1 $C_{3,2}$	1 $C_{3,2}$	average	variance	a_{wg}	2 $C_{3,2}$	2 $C_{3,2}$	average	variance	a_{wg}	3 $C_{3,2}$	3 $C_{3,2}$	average	variance	a_{wg}	4 $C_{3,2}$	4 $C_{3,2}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
item 2	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 9	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 10	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	2,00	1,00	1,50	0,50	0,71
item 11	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 12	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
Average scores	1,08	1,17			0,93	1,17	1,08			0,99	2,33	1,75			0,91	1,25	1,08			0,95
Mutuality	1,13					1,13					2,04					1,17				

Activity 1 - Ex. 4-5-6-7	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer		
Students	1 $C_{3,2}$	1 $C_{3,2}$	average	variance	a_{wg}	2 $C_{3,2}$	2 $C_{3,2}$	average	variance	a_{wg}	3 $C_{3,2}$	3 $C_{3,2}$	average	variance	a_{wg}	4 $C_{3,2}$	4 $C_{3,2}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 2	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	2,00	2,00	2,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	4,00	3,00	3,50	0,50	0,87	2,00	1,00	1,50	0,50	0,71
item 10	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 11	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 12	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
Average scores	1,50	1,50			1,00	1,17	1,08			0,98	2,75	2,42			0,96	1,17	1,17			0,95
Mutuality	1,50					1,13					2,58					1,17				

Activity 2 - Ex. 1-2-3	Obs. 1	Obs. 2				Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	writer		
Students	1 $C_{3,2}$	1 $C_{3,2}$	average	variance	a_{wg}	2 $C_{3,2}$	2 $C_{3,2}$	average	variance	a_{wg}	3 $C_{3,2}$	3 $C_{3,2}$	average	variance	a_{wg}	4 $C_{3,2}$	4 $C_{3,2}$	average	variance	a_{wg}
item 1						3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2						2,00	2,00	2,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 3						2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 5						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6						2,00	2,00	2,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71	3,00	2,00	2,50	0,50	0,87
item 7						3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8						2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9						2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 10						3,00	3,00	3,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87
item 11						2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 12						1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
Average scores						2,00	1,92			0,99	2,67	2,33			0,94	1,50	1,33			0,98
Mutuality						1,96					2,50					1,42				

Activity 2 - Ex. 4	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2			
Students	1 $C_{3,2}$	1 $C_{3,2}$	average	variance	a_{wg}	2 $C_{3,2}$	2 $C_{3,2}$	average	variance	a_{wg}	3 $C_{3,2}$	3 $C_{3,2}$	average	variance	a_{wg}	4 $C_{3,2}$	4 $C_{3,2}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00					
item 2	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87					
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 4	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 6	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87					
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 8	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87					
item 9	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00					
item 10	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87					
item 11	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00					
item 12	2,00	1,00	1,50	0,50	0,71	1,00	2,00	1,50	0,50	0,71	3,00	2,00	2,50	0,50	0,87					
Average scores	1,67	1,67			0,97	1,17	1,25			0,98	2,25	2,17			0,94					
Mutuality	1,67					1,21					2,21									

1st group test	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter		
Students	1 $C_{3,2}$	1 $C_{3,2}$	average	variance	a_{wg}	2 $C_{3,2}$	2 $C_{3,2}$	average	variance	a_{wg}	3 $C_{3,2}$	3 $C_{3,2}$	average	variance	a_{wg}	4 $C_{3,2}$	4 $C_{3,2}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 7	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00
item 8	1,00	2,00	1,50	0,50	0,71	4,00	3,00	3,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 10	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 11	1,00	2,00	1,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 12	1,00	2,00	1,50	0,50	0,71	1,00	2,00	1,50	0,50	0,71	5,00	4,00	4,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
Average scores	1,17	1,58			0,88	1,50	1,50			0,97	3,00	2,83			0,97	1,08	1,08			1,00
Mutuality	1,38					1,50					2,92					1,08				

Activity 8 - Ex. 1-2	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer		
Students	1 $C_{3,2}$	1 $C_{3,2}$	average	variance	a_{wg}	2 $C_{3,2}$	2 $C_{3,2}$	average	variance	a_{wg}	3 $C_{3,2}$	3 $C_{3,2}$	average	variance	a_{wg}	4 $C_{3,2}$	4 $C_{3,2}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
item 2	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 3	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 6	4,00	3,00	3,50	0,50	0,87	5,00	4,00	4,50	0,50	0,71	5,00	4,00	4,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 7	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	4,00	3,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	3,00	2,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 10	2,00	2,00	2,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 11	4,00	3,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 12	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
Average scores	2,42	2,08			0,96	2,83	2,58			0,95	3,25	2,92			0,94	1,17	1,08			0,99
Mutuality	2,25					2,71					3,08					1,13				

2nd group test	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	reader		
Students	1 $C_{3,2}$	1 $C_{3,2}$	average	variance	a_{wg}	2 $C_{3,2}$	2 $C_{3,2}$	average	variance	a_{wg}	3 $C_{3,2}$	3 $C_{3,2}$	average	variance	a_{wg}	4 $C_{3,2}$	4 $C_{3,2}$	average	variance	a_{wg}
item 1	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 6	5,00	4,00	4,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 7	3,00	3,00	3,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 8	4,00	4,00	4,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 10	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 11	4,00	3,00	3,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 12	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
Average scores	3,17	2,92			0,95	1,92	1,83			0,95	3,75	3,50			0,95	1,00	1,00			1,00
Mutuality	3,04					1,88					3,63					1,00				

Activity 1 - Ex. 1-2-3	Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2				Obs. 1	Obs. 2	writer		
Students	1 $C_{3,3}$	1 $C_{3,3}$	average	variance	a_{wg}	2 $C_{3,3}$	2 $C_{3,3}$	average	variance	a_{wg}	3 $C_{3,3}$	3 $C_{3,3}$	average	variance	a_{wg}	4 $C_{3,3}$	4 $C_{3,3}$	average	variance	a_{wg}
item 1	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00						4,00	4,00	4,00	0,00	1,00
item 2	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00						4,00	4,00	4,00	0,00	1,00
item 3	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 5	2,00	2,00	2,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87						3,00	3,00	3,00	0,00	1,00
item 6	3,00	2,00	2,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87						5,00	4,00	4,50	0,50	0,71
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 8	2,00	2,00	2,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87						1,00	1,00	1,00	0,00	1,00
item 9	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00						4,00	4,00	4,00	0,00	1,00
item 10	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00						3,00	4,00	3,50	0,50	0,87
item 11	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00						5,00	5,00	5,00	0,00	1,00
item 12	4,00	3,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00						4,00	4,00	4,00	0,00	1,00
Average scores	2,67	2,58			0,95	2,75	2,83			0,97						3,00	3,00			0,97
Mutuality	2,63					2,79										3,00				

Activity 1 - Ex. 4-5-6-7	Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2				Obs. 1	Obs. 2	writer		
Students	1 $C_{3,3}$	1 $C_{3,3}$	average	variance	a_{wg}	2 $C_{3,3}$	2 $C_{3,3}$	average	variance	a_{wg}	3 $C_{3,3}$	3 $C_{3,3}$	average	variance	a_{wg}	4 $C_{3,3}$	4 $C_{3,3}$	average	variance	a_{wg}
item 1	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00						4,00	3,00	3,50	0,50	0,87
item 2	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00						4,00	4,00	4,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						2,00	2,00	2,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71						5,00	5,00	5,00	0,00	1,00
item 7	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00						3,00	2,00	2,50	0,50	0,87
item 9	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00						4,00	4,00	4,00	0,00	1,00
item 10	2,00	2,00	2,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00						2,00	3,00	2,50	0,50	0,87
item 11	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00						4,00	4,00	4,00	0,00	1,00
item 12	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00						4,00	4,00	4,00	0,00	1,00
Average scores	1,50	1,42			0,99	3,00	2,92			0,98						2,92	2,83			0,97
Mutuality	1,46					2,96										2,88				

Activity 2 - Ex. 1-2-3	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer		
Students	1 $C_{3,3}$	1 $C_{3,3}$	average	variance	a_{wg}	2 $C_{3,3}$	2 $C_{3,3}$	average	variance	a_{wg}	3 $C_{3,3}$	3 $C_{3,3}$	average	variance	a_{wg}	4 $C_{3,3}$	4 $C_{3,3}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	2,00	3,00	2,50	0,50	0,87
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87
item 5	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	2,00	1,00	1,50	0,50	0,71	2,00	3,00	2,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 9	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 10	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 11	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 12	1,00	1,00	1,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
Average scores	1,17	1,08			0,98	2,33	2,58			0,92	3,67	3,75			0,95	3,58	3,58			0,98
Mutuality	1,13					2,46					3,71					3,58				

Activity 2 - Ex. 4	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer		
Students	1 $C_{3,3}$	1 $C_{3,3}$	average	variance	a_{wg}	2 $C_{3,3}$	2 $C_{3,3}$	average	variance	a_{wg}	3 $C_{3,3}$	3 $C_{3,3}$	average	variance	a_{wg}	4 $C_{3,3}$	4 $C_{3,3}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 9	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71
item 10	1,00	2,00	1,50	0,50	0,71	3,00	4,00	3,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87
item 11	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 12	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
Average scores	1,00	1,08			0,98	1,67	1,92			0,95	2,00	2,17			0,97	1,83	2,00			0,97
Mutuality	1,04					1,79					2,08					1,92				

1st group test	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter		
Students	1 $C_{3,3}$	1 $C_{3,3}$	average	variance	a_{wg}	2 $C_{3,3}$	2 $C_{3,3}$	average	variance	a_{wg}	3 $C_{3,3}$	3 $C_{3,3}$	average	variance	a_{wg}	4 $C_{3,3}$	4 $C_{3,3}$	average	variance	a_{wg}
item 1	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
item 6	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 9	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 10	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 11	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	4,00	5,00	4,50	0,50	0,71	4,00	5,00	4,50	0,50	0,71
item 12	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
Average scores	1,08	1,08			1,00	1,50	1,33			0,95	3,00	3,08			0,95	3,00	3,08			0,94
Mutuality	1,08					1,42					3,04					3,04				

Activity 8 - Ex. 1-2	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer		
Students	1 $C_{3,3}$	1 $C_{3,3}$	average	variance	a_{wg}	2 $C_{3,3}$	2 $C_{3,3}$	average	variance	a_{wg}	3 $C_{3,3}$	3 $C_{3,3}$	average	variance	a_{wg}	4 $C_{3,3}$	4 $C_{3,3}$	average	variance	a_{wg}
item 1	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 5	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 6	2,00	2,00	2,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87
item 10	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 11	2,00	1,00	1,50	0,50	0,71	2,00	3,00	2,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 12	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87
Average scores	1,50	1,33			0,97	1,92	1,83			0,97	2,75	2,67			0,97	3,33	2,92			0,93
Mutuality	1,42					1,88					2,71					3,13				

2nd group test	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	reader		
Students	1 $C_{3,3}$	1 $C_{3,3}$	average	variance	a_{wg}	2 $C_{3,3}$	2 $C_{3,3}$	average	variance	a_{wg}	3 $C_{3,3}$	3 $C_{3,3}$	average	variance	a_{wg}	4 $C_{3,3}$	4 $C_{3,3}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	2,00	1,00	1,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 6	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	5,00	4,00	4,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	4,00	3,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87
item 9	2,00	1,00	1,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 10	2,00	2,00	2,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 11	2,00	1,00	1,50	0,50	0,71	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71
item 12	1,00	1,00	1,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
Average scores	1,42	1,17			0,93	2,08	2,08			0,94	2,92	2,83			0,95	3,17	3,08			0,92
Mutuality	1,29					2,08					2,88					3,13				

Activity 1 - Ex. 1-2-3	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer		
Students	1 $C_{3,4}$	1 $C_{3,4}$	average	variance	a_{wg}	2 $C_{3,4}$	2 $C_{3,4}$	average	variance	a_{wg}	3 $C_{3,4}$	3 $C_{3,4}$	average	variance	a_{wg}	4 $C_{3,4}$	4 $C_{3,4}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	2,00	1,50	0,50	0,71
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00
item 6	2,00	2,00	2,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00
item 9	2,00	3,00	2,50	0,50	0,87	4,00	5,00	4,50	0,50	0,71	2,00	3,00	2,50	0,50	0,87	4,00	5,00	4,50	0,50	0,71
item 10	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 11	1,00	2,00	1,50	0,50	0,71	4,00	4,00	4,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 12	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
Average scores	1,33	1,50			0,97	2,67	2,58			0,94	2,00	2,08			0,92	2,25	2,42			0,95
Mutuality	1,42					2,63					2,04					2,33				

Activity 1 - Ex. 4-5-6-7	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer		
Students	1 $C_{3,4}$	1 $C_{3,4}$	average	variance	a_{wg}	2 $C_{3,4}$	2 $C_{3,4}$	average	variance	a_{wg}	3 $C_{3,4}$	3 $C_{3,4}$	average	variance	a_{wg}	4 $C_{3,4}$	4 $C_{3,4}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	3,00	2,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 9	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 10	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87
item 11	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 12	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
Average scores	1,17	1,08			0,99	1,67	1,92			0,94	1,33	1,25			0,99	1,83	1,83			0,94
Mutuality	1,13					1,79					1,29					1,83				

Activity 2 - Ex. 1-2-3	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer		
Students	1 $C_{3,4}$	1 $C_{3,4}$	average	variance	a_{wg}	2 $C_{3,4}$	2 $C_{3,4}$	average	variance	a_{wg}	3 $C_{3,4}$	3 $C_{3,4}$	average	variance	a_{wg}	4 $C_{3,4}$	4 $C_{3,4}$	average	variance	a_{wg}
item 1	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	3,00	2,00	2,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 5	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 6	4,00	3,00	3,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	2,00	1,50	0,50	0,71	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 9	3,00	3,00	3,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 10	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 11	3,00	3,00	3,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71	2,00	3,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00
item 12	2,00	3,00	2,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
Average scores	2,42	2,42			0,94	2,92	2,92			0,94	1,75	1,83			0,97	1,83	1,75			0,99
Mutuality	2,42					2,92					1,79					1,79				

Activity 2 - Ex. 4	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2			
Students	1 $C_{3,4}$	1 $C_{3,4}$	average	variance	a_{wg}	2 $C_{3,4}$	2 $C_{3,4}$	average	variance	a_{wg}	3 $C_{3,4}$	3 $C_{3,4}$	average	variance	a_{wg}	4 $C_{3,4}$	4 $C_{3,4}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00					
item 2	2,00	2,00	2,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00					
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 6	3,00	2,00	2,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87					
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00					
item 8	1,00	2,00	1,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87					
item 9	3,00	3,00	3,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 10	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00					
item 11	2,00	3,00	2,50	0,50	0,87	4,00	5,00	4,50	0,50	0,71	3,00	3,00	3,00	0,00	1,00					
item 12	3,00	4,00	3,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00					
Average scores	1,92	2,08			0,94	3,33	3,42			0,95	2,50	2,50			0,98					
Mutuality	2,00					3,38					2,50									

1st group test	Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2				Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter		
Students	1 $C_{3,4}$	1 $C_{3,4}$	average	variance	a_{wg}	2 $C_{3,4}$	2 $C_{3,4}$	average	variance	a_{wg}	3 $C_{3,4}$	3 $C_{3,4}$	average	variance	a_{wg}	4 $C_{3,4}$	4 $C_{3,4}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 2	3,00	3,00	3,00	0,00	1,00						2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	2,00	2,00	2,00	0,00	1,00						2,00	2,00	2,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 6	4,00	3,00	3,50	0,50	0,87						3,00	2,00	2,50	0,50	0,87	5,00	4,00	4,50	0,50	0,71
item 7	3,00	3,00	3,00	0,00	1,00						1,00	2,00	1,50	0,50	0,71	3,00	3,00	3,00	0,00	1,00
item 8	3,00	2,00	2,50	0,50	0,87						2,00	3,00	2,50	0,50	0,87	5,00	4,00	4,50	0,50	0,71
item 9	4,00	4,00	4,00	0,00	1,00						2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 10	4,00	4,00	4,00	0,00	1,00						3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 11	3,00	4,00	3,50	0,50	0,87						2,00	2,00	2,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 12	4,00	4,00	4,00	0,00	1,00						3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
Average scores	2,75	2,67			0,97						1,92	2,00			0,95	3,00	2,83			0,93
Mutuality	2,71										1,96					2,92				

Activity 8 - Ex. 1-2	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer		
Students	1 $C_{3,4}$	1 $C_{3,4}$	average	variance	a_{wg}	2 $C_{3,4}$	2 $C_{3,4}$	average	variance	a_{wg}	3 $C_{3,4}$	3 $C_{3,4}$	average	variance	a_{wg}	4 $C_{3,4}$	4 $C_{3,4}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 2	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 3	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 4	4,00	3,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 5	3,00	2,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 6	4,00	4,00	4,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 8	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 9	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 10	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 11	3,00	4,00	3,50	0,50	0,87	4,00	5,00	4,50	0,50	0,71	2,00	3,00	2,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00
item 12	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
Average scores	3,08	3,00			0,97	3,17	3,17			0,93	1,58	1,75			0,97	3,00	2,83			0,93
Mutuality	3,04					3,17					1,67					2,92				

2nd group test	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	reader-mediator		
Students	1 $C_{3,4}$	1 $C_{3,4}$	average	variance	a_{wg}	2 $C_{3,4}$	2 $C_{3,4}$	average	variance	a_{wg}	3 $C_{3,4}$	3 $C_{3,4}$	average	variance	a_{wg}	4 $C_{3,4}$	4 $C_{3,4}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 2	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00						5,00	5,00	5,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00						3,00	2,00	2,50	0,50	0,87
item 5	1,00	2,00	1,50	0,50	0,71	1,00	2,00	1,50	0,50	0,71						3,00	3,00	3,00	0,00	1,00
item 6	2,00	2,00	2,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87						3,00	3,00	3,00	0,00	1,00
item 7	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00						5,00	5,00	5,00	0,00	1,00
item 8	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00						5,00	5,00	5,00	0,00	1,00
item 9	3,00	4,00	3,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87						3,00	4,00	3,50	0,50	0,87
item 10	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00						5,00	5,00	5,00	0,00	1,00
item 11	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00						5,00	4,00	4,50	0,50	0,71
item 12	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00						4,00	4,00	4,00	0,00	1,00
Average scores	3,25	3,42			0,97	3,42	3,50			0,95						3,58	3,50			0,95
Mutuality	3,33					3,46										3,54				

Activity 1 - Ex. 1-2-3	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2				Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	writer		
Students	1 $C_{3,5}$	1 $C_{3,5}$	average	variance	a_{wg}	2 $C_{3,5}$	2 $C_{3,5}$	average	variance	a_{wg}	3 $C_{3,5}$	3 $C_{3,5}$	average	variance	a_{wg}	4 $C_{3,5}$	4 $C_{3,5}$	average	variance	a_{wg}
item 1	3,00	3,00	3,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87
item 2	4,00	3,00	3,50	0,50	0,87						5,00	4,00	4,50	0,50	0,71	5,00	4,00	4,50	0,50	0,71
item 3	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00						2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 5	1,00	2,00	1,50	0,50	0,71						1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 6	4,00	3,00	3,50	0,50	0,87						5,00	4,00	4,50	0,50	0,71	4,00	4,00	4,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 8	2,00	2,00	2,00	0,00	1,00						2,00	1,00	1,50	0,50	0,71	1,00	2,00	1,50	0,50	0,71
item 9	4,00	4,00	4,00	0,00	1,00						5,00	5,00	5,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71
item 10	5,00	5,00	5,00	0,00	1,00						5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 11	4,00	4,00	4,00	0,00	1,00						5,00	5,00	5,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 12	5,00	5,00	5,00	0,00	1,00						5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
Average scores	2,92	2,83			0,95						3,17	2,92			0,93	3,17	3,25			0,89
Mutuality	2,88										3,04					3,21				

Activity 1 - Ex. 4-5-6-7	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2				Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	writer		
Students	1 $C_{3,5}$	1 $C_{3,5}$	average	variance	a_{wg}	2 $C_{3,5}$	2 $C_{3,5}$	average	variance	a_{wg}	3 $C_{3,5}$	3 $C_{3,5}$	average	variance	a_{wg}	4 $C_{3,5}$	4 $C_{3,5}$	average	variance	a_{wg}
item 1	2,00	3,00	2,50	0,50	0,87						1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 2	2,00	2,00	2,00	0,00	1,00						4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00						4,00	3,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00						1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 6	2,00	3,00	2,50	0,50	0,87						5,00	4,00	4,50	0,50	0,71	5,00	4,00	4,50	0,50	0,71
item 7	2,00	2,00	2,00	0,00	1,00						1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00						2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 9	3,00	3,00	3,00	0,00	1,00						4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 10	4,00	4,00	4,00	0,00	1,00						4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 11	3,00	4,00	3,50	0,50	0,87						4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 12	4,00	4,00	4,00	0,00	1,00						4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
Average scores	2,17	2,42			0,97						2,92	2,83			0,94	2,75	2,75			0,95
Mutuality	2,29										2,88					2,75				

Activity 2 - Ex. 1-2-3	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer		
Students	1 $C_{3,5}$	1 $C_{3,5}$	average	variance	a_{wg}	2 $C_{3,5}$	2 $C_{3,5}$	average	variance	a_{wg}	3 $C_{3,5}$	3 $C_{3,5}$	average	variance	a_{wg}	4 $C_{3,5}$	4 $C_{3,5}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 2	2,00	2,00	2,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 4	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 5	2,00	3,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87
item 6	2,00	2,00	2,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 9	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 10	3,00	3,00	3,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71
item 11	2,00	3,00	2,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 12	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
Average scores	1,75	1,92			0,98	3,17	3,25			0,89	3,50	3,33			0,98	3,17	3,17			0,92
Mutuality	1,83					3,21					3,42					3,17				

Activity 2 - Ex. 4	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer		
Students	1 $C_{3,5}$	1 $C_{3,5}$	average	variance	a_{wg}	2 $C_{3,5}$	2 $C_{3,5}$	average	variance	a_{wg}	3 $C_{3,5}$	3 $C_{3,5}$	average	variance	a_{wg}	4 $C_{3,5}$	4 $C_{3,5}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 8	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	1,00	1,00	1,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71	3,00	4,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00
item 10	2,00	3,00	2,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
item 11	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 12	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
Average scores	1,08	1,17			0,99	2,00	2,25			0,93	1,50	1,83			0,93	1,33	1,42			0,95
Mutuality	1,13					2,13					1,67					1,38				

1st group test	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter		
Students	1 $C_{3,5}$	1 $C_{3,5}$	average	variance	a_{wg}	2 $C_{3,5}$	2 $C_{3,5}$	average	variance	a_{wg}	3 $C_{3,5}$	3 $C_{3,5}$	average	variance	a_{wg}	4 $C_{3,5}$	4 $C_{3,5}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	2,00	2,00	2,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	1,00	2,00	1,50	0,50	0,71
item 6	1,00	2,00	1,50	0,50	0,71	5,00	4,00	4,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 7	1,00	2,00	1,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	1,00	2,00	1,50	0,50	0,71
item 8	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 10	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 11	2,00	2,00	2,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	2,00	1,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 12	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
Average scores	1,42	1,58			0,95	2,50	2,25			0,92	1,75	1,42			0,94	1,08	1,25			0,95
Mutuality	1,50					2,38					1,58					1,17				

Activity 8 - Ex. 1-2	Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2			
Students	1 $C_{3,5}$	1 $C_{3,5}$	average	variance	a_{wg}	2 $C_{3,5}$	2 $C_{3,5}$	average	variance	a_{wg}	3 $C_{3,5}$	3 $C_{3,5}$	average	variance	a_{wg}	4 $C_{3,5}$	4 $C_{3,5}$	average	variance	a_{wg}
item 1	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 2	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00					
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87					
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 5	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	1,00	2,00	1,50	0,50	0,71					
item 6	4,00	3,00	3,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00					
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00					
item 9	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	5,00	4,50	0,50	0,71					
item 10	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00					
item 11	3,00	4,00	3,50	0,50	0,87	4,00	5,00	4,50	0,50	0,71	3,00	4,00	3,50	0,50	0,87					
item 12	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00					
Average scores	2,33	2,33			0,98	2,92	2,92			0,97	2,67	2,83			0,93					
Mutuality	2,33					2,92					2,75									

2nd group test	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	reader		
Students	1 $C_{3,5}$	1 $C_{3,5}$	average	variance	a_{wg}	2 $C_{3,5}$	2 $C_{3,5}$	average	variance	a_{wg}	3 $C_{3,5}$	3 $C_{3,5}$	average	variance	a_{wg}	4 $C_{3,5}$	4 $C_{3,5}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 2	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00					
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00					
item 5	1,00	1,00	1,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00					
item 6	2,00	3,00	2,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87	5,00	4,00	4,50	0,50	0,71					
item 7	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	2,00	1,50	0,50	0,71					
item 8	4,00	3,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00					
item 9	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00					
item 10	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00					
item 11	3,00	4,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87					
item 12	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00					
Average scores	2,25	2,33			0,97	2,83	2,75			0,92	2,83	2,75			0,94					
Mutuality	2,29					2,79					2,79									

Activity 1 - Ex. 1-2-3	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer		
Students	1 $C_{3,6}$	1 $C_{3,6}$	average	variance	a_{wg}	2 $C_{3,6}$	2 $C_{3,6}$	average	variance	a_{wg}	3 $C_{3,6}$	3 $C_{3,6}$	average	variance	a_{wg}	4 $C_{3,6}$	4 $C_{3,6}$	average	variance	a_{wg}
item 1	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 5	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 9	3,00	4,00	3,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87
item 10	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 11	2,00	3,00	2,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87	1,00	2,00	1,50	0,50	0,71	1,00	2,00	1,50	0,50	0,71
item 12	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
Average scores	2,00	2,17			0,98	1,92	2,25			0,94	1,58	1,92			0,87	1,50	1,67			0,97
Mutuality	2,08					2,08					1,75					1,58				

Activity 1 - Ex. 4-5-6-7	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer		
Students	1 $C_{3,6}$	1 $C_{3,6}$	average	variance	a_{wg}	2 $C_{3,6}$	2 $C_{3,6}$	average	variance	a_{wg}	3 $C_{3,6}$	3 $C_{3,6}$	average	variance	a_{wg}	4 $C_{3,6}$	4 $C_{3,6}$	average	variance	a_{wg}
item 1	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 3	1,00	2,00	1,50	0,50	0,71	1,00	2,00	1,50	0,50	0,71	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	4,00	3,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 9	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 10	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 11	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 12	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
Average scores	1,50	1,58			0,98	1,58	1,75			0,95	2,17	2,25			0,95	2,33	2,42			0,94
Mutuality	1,54					1,67					2,21					2,38				

Activity 2 - Ex. 1-2-3	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer		
Students	1 $C_{3,6}$	1 $C_{3,6}$	average	variance	a_{wg}	2 $C_{3,6}$	2 $C_{3,6}$	average	variance	a_{wg}	3 $C_{3,6}$	3 $C_{3,6}$	average	variance	a_{wg}	4 $C_{3,6}$	4 $C_{3,6}$	average	variance	a_{wg}
item 1	2,00	2,00	2,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 3	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 6	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00
item 7	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 9	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 10	3,00	3,00	3,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 11	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87
item 12	2,00	3,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
Average scores	1,83	2,08			0,95	1,33	1,33			0,97	2,25	2,42			0,98	2,58	2,67			0,95
Mutuality	1,96					1,33					2,33					2,63				

Activity 2 - Ex. 4	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer		
Students	1 $C_{3,6}$	1 $C_{3,6}$	average	variance	a_{wg}	2 $C_{3,6}$	2 $C_{3,6}$	average	variance	a_{wg}	3 $C_{3,6}$	3 $C_{3,6}$	average	variance	a_{wg}	4 $C_{3,6}$	4 $C_{3,6}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 2	2,00	2,00	2,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 9	4,00	5,00	4,50	0,50	0,71	2,00	3,00	2,50	0,50	0,87	4,00	5,00	4,50	0,50	0,71	4,00	5,00	4,50	0,50	0,71
item 10	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 11	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 12	2,00	3,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
Average scores	1,75	2,00			0,95	1,33	1,33			0,97	1,83	2,08			0,95	1,42	1,50			0,98
Mutuality	1,88					1,33					1,96					1,46				

1st group test	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter		
Students	1 $C_{3,6}$	1 $C_{3,6}$	average	variance	a_{wg}	2 $C_{3,6}$	2 $C_{3,6}$	average	variance	a_{wg}	3 $C_{3,6}$	3 $C_{3,6}$	average	variance	a_{wg}	4 $C_{3,6}$	4 $C_{3,6}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87
item 6	3,00	3,00	3,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	5,00	4,00	4,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00
item 7	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 8	5,00	5,00	5,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 9	5,00	4,00	4,50	0,50	0,71	2,00	2,00	2,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71	3,00	3,00	3,00	0,00	1,00
item 10	5,00	5,00	5,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 11	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 12	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
Average scores	3,17	3,00			0,97	1,92	1,83			0,95	3,33	3,08			0,94	2,50	2,33			0,98
Mutuality	3,08					1,88					3,21					2,42				

Activity 8 - Ex. 1-2	Obs. 1	Obs. 2	reader			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	writer		
Students	1 $C_{3,6}$	1 $C_{3,6}$	average	variance	a_{wg}	2 $C_{3,6}$	2 $C_{3,6}$	average	variance	a_{wg}	3 $C_{3,6}$	3 $C_{3,6}$	average	variance	a_{wg}	4 $C_{3,6}$	4 $C_{3,6}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 2	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	4,00	3,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 6	4,00	3,00	3,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	3,00	2,00	2,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87
item 10	4,00	3,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 11	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	4,00	4,50	0,50	0,71
item 12	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
Average scores	2,25	2,00			0,97	2,33	2,08			0,97	2,50	2,50			0,98	2,83	2,83			0,93
Mutuality	2,13					2,21					2,50					2,83				

2nd group test	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	mediator			Obs. 1	Obs. 2	reader		
Students	1 $C_{3,6}$	1 $C_{3,6}$	average	variance	a_{wg}	2 $C_{3,6}$	2 $C_{3,6}$	average	variance	a_{wg}	3 $C_{3,6}$	3 $C_{3,6}$	average	variance	a_{wg}	4 $C_{3,6}$	4 $C_{3,6}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	4,00	4,00	4,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 3	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 6	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	2,00	3,00	2,50	0,50	0,87
item 7	1,00	2,00	1,50	0,50	0,71	1,00	2,00	1,50	0,50	0,71	1,00	2,00	1,50	0,50	0,71	5,00	5,00	5,00	0,00	1,00
item 8	5,00	5,00	5,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 9	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 10	4,00	4,00	4,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 11	4,00	4,00	4,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87	3,00	4,00	3,50	0,50	0,87	5,00	4,00	4,50	0,50	0,71
item 12	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
Average scores	2,67	2,83			0,95	1,92	2,08			0,93	2,50	2,75			0,95	3,17	3,17			0,97
Mutuality	2,75					2,00					2,63					3,17				

Activity 1 - Ex. 1-2-3	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	reader-mediator		
Students	1 $C_{3,7}$	1 $C_{3,7}$	average	variance	a_{wg}	2 $C_{3,7}$	2 $C_{3,7}$	average	variance	a_{wg}	3 $C_{3,7}$	3 $C_{3,7}$	average	variance	a_{wg}
item 1	2,00	3,00	2,50	0,50	0,87	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 3	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87
item 6	3,00	3,00	3,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 7	1,00	1,00	1,00	0,00	1,00	3,00	2,00	2,50	0,50	0,87	1,00	1,00	1,00	0,00	1,00
item 8	2,00	2,00	2,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 10	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 11	2,00	3,00	2,50	0,50	0,87	1,00	2,00	1,50	0,50	0,71	3,00	4,00	3,50	0,50	0,87
item 12	4,00	3,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87
Average scores	2,58	2,58			0,96	1,92	1,83			0,95	2,58	2,42			0,96
Mutuality	2,58					1,88					2,50				

Activity 1 - Ex. 4-5-6-7	Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	reader-mediator		
Students	1 $C_{3,7}$	1 $C_{3,7}$	average	variance	a_{wg}	2 $C_{3,7}$	2 $C_{3,7}$	average	variance	a_{wg}	3 $C_{3,7}$	3 $C_{3,7}$	average	variance	a_{wg}
item 1	4,00	4,00	4,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 6	4,00	3,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71
item 9	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 10	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 11	3,00	2,00	2,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 12	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
Average scores	2,42	2,25			0,98	2,17	2,00			0,98	2,17	2,33			0,95
Mutuality	2,33					2,08					2,25				

Activity 2 - Ex. 1-2-3	Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer		
Students	1 $C_{3,7}$	1 $C_{3,7}$	average	variance	a_{wg}	2 $C_{3,7}$	2 $C_{3,7}$	average	variance	a_{wg}	3 $C_{3,7}$	3 $C_{3,7}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00
item 2	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 6	2,00	2,00	2,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 9	2,00	2,00	2,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 10	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 11	1,00	2,00	1,50	0,50	0,71	1,00	2,00	1,50	0,50	0,71	2,00	3,00	2,50	0,50	0,87
item 12	2,00	1,00	1,50	0,50	0,71	3,00	2,00	2,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87
Average scores	1,50	1,50			0,95	1,92	1,92			0,93	2,17	2,08			0,97
Mutuality	1,50					1,92					2,13				

Activity 2 - Ex. 4	Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer		
Students	1 $C_{3,7}$	1 $C_{3,7}$	average	variance	a_{wg}	2 $C_{3,7}$	2 $C_{3,7}$	average	variance	a_{wg}	3 $C_{3,7}$	3 $C_{3,7}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 2	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	1,00	2,00	1,50	0,50	0,71	1,00	1,00	1,00	0,00	1,00
item 6	2,00	2,00	2,00	0,00	1,00	2,00	1,00	1,50	0,50	0,71	4,00	3,00	3,50	0,50	0,87
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 9	2,00	3,00	2,50	0,50	0,87	1,00	2,00	1,50	0,50	0,71	3,00	4,00	3,50	0,50	0,87
item 10	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 11	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 12	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
Average scores	1,33	1,42			0,99	1,42	1,50			0,93	2,08	2,17			0,97
Mutuality	1,38					1,46					2,13				

1st group test	Obs. 1	Obs. 2				Obs. 1	Obs. 2	reader-mediator			Obs. 1	Obs. 2	writer-presenter		
Students	1 $C_{3,7}$	1 $C_{3,7}$	average	variance	a_{wg}	2 $C_{3,7}$	2 $C_{3,7}$	average	variance	a_{wg}	3 $C_{3,7}$	3 $C_{3,7}$	average	variance	a_{wg}
item 1						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2						3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 3						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5						3,00	2,00	2,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87
item 6						4,00	3,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00
item 7						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8						3,00	2,00	2,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87
item 9						3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 10						3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 11						3,00	3,00	3,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 12						3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
Average scores						2,42	2,17			0,97	2,67	2,42			0,97
Mutuality						2,29					2,54				

Activity 8 - Ex. 1-2	Obs. 1	Obs. 2				Obs. 1	Obs. 2	writer-presenter			Obs. 1	Obs. 2	reader-mediator		
Students	1 $C_{3,7}$	1 $C_{3,7}$	average	variance	a_{wg}	2 $C_{3,7}$	2 $C_{3,7}$	average	variance	a_{wg}	3 $C_{3,7}$	3 $C_{3,7}$	average	variance	a_{wg}
item 1						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2						3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 3						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5						3,00	2,00	2,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87
item 6						4,00	3,00	3,50	0,50	0,87	4,00	4,00	4,00	0,00	1,00
item 7						1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 8						3,00	2,00	2,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87
item 9						3,00	3,00	3,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 10						3,00	3,00	3,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 11						3,00	3,00	3,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 12						3,00	3,00	3,00	0,00	1,00	2,00	2,00	2,00	0,00	1,00
Average scores						2,42	2,17			0,97	2,67	2,42			0,97
Mutuality						2,29					2,54				

2nd group test	Obs. 1	Obs. 2	presenter			Obs. 1	Obs. 2	writer			Obs. 1	Obs. 2	reader-mediator		
Students	1 $C_{3,7}$	1 $C_{3,7}$	average	variance	a_{wg}	2 $C_{3,7}$	2 $C_{3,7}$	average	variance	a_{wg}	3 $C_{3,7}$	3 $C_{3,7}$	average	variance	a_{wg}
item 1	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 2	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 3	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 4	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00
item 5	1,00	1,00	1,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00
item 6	5,00	5,00	5,00	0,00	1,00	5,00	5,00	5,00	0,00	1,00	2,00	3,00	2,50	0,50	0,87
item 7	1,00	1,00	1,00	0,00	1,00	1,00	1,00	1,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
item 8	3,00	2,00	2,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87	3,00	2,00	2,50	0,50	0,87
item 9	4,00	3,00	3,50	0,50	0,87	3,00	3,00	3,00	0,00	1,00	4,00	3,00	3,50	0,50	0,87
item 10	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00
item 11	3,00	4,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87	4,00	3,00	3,50	0,50	0,87
item 12	4,00	4,00	4,00	0,00	1,00	4,00	4,00	4,00	0,00	1,00	3,00	3,00	3,00	0,00	1,00
Average scores	2,67	2,58			0,97	3,00	2,83			0,98	2,92	2,75			0,96
Mutuality	2,63					2,92					2,83				

Appendix D.3: Questionnaires data

Appendix D.3.1: Questionnaires full data - Class A_3

Initial attitude questionnaire class A_3

class A_3	1	2	3	4	5	6	7	8	9	totals	totals by groups
student 1 $A_{3,1}$	2	3	4	3	4	4	3	4	4	**3,44**	
student 2 $A_{3,1}$	1	1	1	2	4	3	1	3	1	**1,89**	
student 3 $A_{3,1}$	2	2	2	1	2	3	1	1	4	**2,00**	
student 4 $A_{3,1}$	2	4	2	1	2	3	1	1	1	**1,89**	**2,31**
student 1 $A_{3,2}$	1	3	3	2	4	3	1	2	2	**2,33**	
student 2 $A_{3,2}$	2	4	2	1	3	2	2	2	1	**2,11**	
student 3 $A_{3,2}$	2	3	1	1	2	2	1	1	1	**1,56**	
student 4 $A_{3,2}$	1	3	2	1	3	3	1	1	1	**1,78**	**1,94**
student 1 $A_{3,3}$	1	3	2	1	2	3	2	3	1	**2,00**	
student 2 $A_{3,3}$	1	4	1	2	2	4	1	4	3	**2,44**	
student 3 $A_{3,3}$	2	2	2	1	3	3	1	3	4	**2,33**	
student 4 $A_{3,3}$	1	4	3	3	3	4	2	2	1	**2,56**	**2,33**
student 1 $A_{3,4}$	2	4	3	2	3	4	2	3	2	**2,78**	
student 2 $A_{3,4}$	2	4	3	2	3	3	2	2	4	**2,78**	
student 3 $A_{3,4}$	2	4	3	1	3	3	2	4	3	**2,78**	
student 4 $A_{3,4}$	2	2	2	1	3	3	1	2	2	**2,00**	**2,58**
student 1 $A_{3,5}$	2	4	3	2	2	3	1	3	4	**2,67**	
student 2 $A_{3,5}$	4	4	4	2	3	4	2	2	3	**3,11**	
student 3 $A_{3,5}$	2	4	3	1	4	4	2	2	2	**2,67**	
student 4 $A_{3,5}$	3	3	3	2	2	3	1	4	4	**2,78**	**2,81**
student 1 $A_{3,6}$	2	3	3	1	4	3	1	3	1	**2,33**	
student 2 $A_{3,6}$	2	4	2	1	3	4	1	3	2	**2,44**	
student 3 $A_{3,6}$	3	4	3	3	4	4	2	3	4	**3,33**	
student 4 $A_{3,6}$	2	2	2	1	3	3	1	3	4	**2,33**	**2,61**
student 1 $A_{3,7}$	4	4	3	4	2	3	3	4	4	**3,44**	
student 2 $A_{3,7}$	2	4	3	2	2	3	1	2	4	**2,56**	
student 3 $A_{3,7}$	2	4	3	2	4	3	1	3	1	**2,56**	**2,85**
totals by question	**2,00**	**3,33**	**2,52**	**1,70**	**2,93**	**3,22**	**1,48**	**2,59**	**2,52**	**2,48**	

Final attitude questionnaire class A_3

class A_3	1	2	3	4	5	6	7	8	9	totals	totals by groups
student 1 $A_{3,1}$	2	4	4	3	4	3	3	4	4	**3,44**	
student 2 $A_{3,1}$	1	3	2	1	2	3	1	3	2	**2,00**	
student 3 $A_{3,1}$	2	3	4	1	4	3	2	3	4	**2,89**	
student 4 $A_{3,1}$	2	4	2	1	2	3	2	1	1	**2,00**	**2,58**
student 1 $A_{3,2}$	-	-	-	-	-	-	-	-	-	**-**	
student 2 $A_{3,2}$	2	3	3	1	3	3	3	1	1	**2,22**	
student 3 $A_{3,2}$	3	4	3	1	4	3	2	2	1	**2,56**	
student 4 $A_{3,2}$	2	4	3	1	3	3	1	1	2	**2,22**	**2,33**
student 1 $A_{3,3}$	1	3	3	1	2	2	1	3	1	**1,89**	
student 2 $A_{3,3}$	2	4	2	1	2	3	2	4	3	**2,56**	
student 3 $A_{3,3}$	2	3	3	2	3	2	1	4	4	**2,67**	
student 4 $A_{3,3}$	3	4	3	4	2	4	2	3	2	**3,00**	**2,53**
student 1 $A_{3,4}$	2	3	4	2	4	3	3	3	2	**2,89**	
student 2 $A_{3,4}$	3	4	4	3	3	3	2	3	3	**3,11**	
student 3 $A_{3,4}$	2	3	3	2	3	2	2	4	3	**2,67**	
student 4 $A_{3,4}$	2	4	3	1	3	3	3	2	2	**2,56**	**2,81**
student 1 $A_{3,5}$	3	4	4	2	2	3	2	3	3	**2,89**	
student 2 $A_{3,5}$	3	4	4	2	3	4	3	4	2	**3,22**	
student 3 $A_{3,5}$	2	4	2	1	3	3	2	3	2	**2,44**	
student 4 $A_{3,5}$	3	3	4	2	3	3	2	4	4	**3,11**	**2,92**
student 1 $A_{3,6}$	2	4	4	3	4	4	3	4	2	**3,33**	
student 2 $A_{3,6}$	2	4	3	1	3	3	1	3	3	**2,56**	
student 3 $A_{3,6}$	4	4	4	2	4	4	3	4	4	**3,67**	
student 4 $A_{3,6}$	1	3	3	2	4	4	2	4	2	**2,78**	**3,08**
student 1 $A_{3,7}$	3	4	3	4	3	4	4	4	4	**3,67**	
student 2 $A_{3,7}$	3	4	4	1	3	2	1	4	4	**2,89**	
student 3 $A_{3,7}$	2	4	4	3	3	3	2	4	2	**3,00**	**3,19**
totals by question	**2,27**	**3,65**	**3,27**	**1,85**	**3,04**	**3,08**	**2,12**	**3,15**	**2,58**	**2,78**	

Initial – final questionnaires comparison class A_3

students	totals	totals by group	totals	totals by group	initial – final differences	initial – final differences by group
student 1 $A_{3,1}$	3,44		3,44		**0,00**	
student 2 $A_{3,1}$	1,89		2,00		**0,11**	
student 3 $A_{3,1}$	2,00		2,89		**0,89**	
student 4 $A_{3,1}$	1,89	2,31	2,00	2,58	**0,11**	**0,28**
student 1 $A_{3,2}$	2,33		-		**-**	
student 2 $A_{3,2}$	2,11		2,22		**0,11**	
student 3 $A_{3,2}$	1,56		2,56		**1,00**	
student 4 $A_{3,2}$	1,78	1,81	2,22	2,33	**0,44**	**0,52**
student 1 $A_{3,3}$	2,00		1,89		**-0,11**	
student 2 $A_{3,3}$	2,44		2,56		**0,11**	
student 3 $A_{3,3}$	2,33		2,67		**0,33**	
student 4 $A_{3,3}$	2,56	2,33	3,00	2,53	**0,44**	**0,19**
student 1 $A_{3,4}$	2,78		2,89		**0,11**	
student 2 $A_{3,4}$	2,78		3,11		**0,33**	
student 3 $A_{3,4}$	2,78		2,67		**-0,11**	
student 4 $A_{3,4}$	2,00	2,58	2,56	2,81	**0,56**	**0,22**
student 1 $A_{3,5}$	2,67		2,89		**0,22**	
student 2 $A_{3,5}$	3,11		3,22		**0,11**	
student 3 $A_{3,5}$	2,67		2,44		**-0,22**	
student 4 $A_{3,5}$	2,78	2,81	3,11	2,92	**0,33**	**0,11**
student 1 $A_{3,6}$	2,33		3,33		**1,00**	
student 2 $A_{3,6}$	2,44		2,56		**0,11**	
student 3 $A_{3,6}$	3,33		3,67		**0,33**	
student 4 $A_{3,6}$	2,33	2,61	2,78	3,08	**0,44**	**0,47**
student 1 $A_{3,7}$	3,44		3,67		**0,22**	
student 2 $A_{3,7}$	2,56		2,89		**0,33**	
student 3 $A_{3,7}$	2,56	2,85	3,00	3,19	**0,44**	**0,33**
totals by question	**2,48**		**2,78**		**0,29**	

Appendix D.3.2: Questionnaires full data - Class B_3

Initial attitude questionnaire class B_3

class B_3	1	2	3	4	5	6	7	8	9	totals	totals by groups
student 1 $B_{3,1}$	2	1	2	1	3	3	1	1	2	**1,78**	
student 2 $B_{3,1}$	1	1	3	1	2	3	1	1	1	**1,56**	
student 3 $B_{3,1}$	2	4	3	2	4	4	3	4	4	**3,33**	
student 4 $B_{3,1}$	2	4	2	2	2	5	1	2	3	**2,56**	**2,31**
student 1 $B_{3,2}$	2	3	3	2	3	3	2	3	4	**2,78**	
student 2 $B_{3,2}$	3	3	3	3	3	2	3	4	4	**3,11**	
student 3 $B_{3,2}$	3	4	3	2	3	4	2	4	4	**3,22**	
student 4 $B_{3,2}$	2	3	2	1	4	4	2	2	1	**2,33**	**2,86**
student 1 $B_{3,3}$	1	4	1	1	1	1	1	1	1	**1,33**	
student 2 $B_{3,3}$	2	4	2	2	4	4	2	-	2	**2,75**	
student 3 $B_{3,3}$	3	1	3	4	4	2	1	3	2	**2,56**	
student 4 $B_{3,3}$	3	3	3	2	4	4	3	4	3	**3,22**	**2,47**
student 1 $B_{3,4}$	2	4	2	1	2	3	1	2	2	**2,11**	
student 2 $B_{3,4}$	2	4	2	1	3	2	1	3	3	**2,33**	
student 3 $B_{3,4}$	4	4	3	3	4	4	2	4	4	**3,56**	
student 4 $B_{3,4}$	3	4	4	2	3	4	1	3	2	**2,89**	**2,72**
student 1 $B_{3,5}$	2	3	2	1	3	3	1	3	2	**2,22**	
student 2 $B_{3,5}$	2	4	2	2	3	3	2	4	1	**2,56**	
student 3 $B_{3,4}$	2	2	4	4	4	4	4	4	4	**3,56**	**2,78**
student 1 $B_{3,6}$	1	3	2	1	3	3	1	3	2	**2,11**	
student 2 $B_{3,6}$	1	4	3	1	3	3	1	2	2	**2,22**	
student 3 $B_{3,6}$	3	3	2	1	2	2	1	2	1	**1,89**	**2,07**
totals by question	**2,18**	**3,18**	**2,55**	**1,82**	**3,05**	**3,18**	**1,68**	**2,81**	**2,45**	**2,54**	

Final attitude questionnaire class B_3

class B_3	1	2	3	4	5	6	7	8	9	totals	totals by groups
student 1 $B_{3,1}$	2	3	4	1	4	3	3	4	4	**3,11**	
student 2 $B_{3,1}$	2	3	4	1	3	3	2	2	2	**2,44**	
student 3 $B_{3,1}$	1	2	4	2	4	4	3	4	1	**2,78**	
student 4 $B_{3,1}$	2	4	3	3	3	4	3	4	4	**3,33**	**2,92**
student 1 $B_{3,2}$	2	3	4	2	4	3	3	4	3	**3,11**	
student 2 $B_{3,2}$	3	3	2	2	2	3	1	2	4	**2,44**	
student 3 $B_{3,2}$	3	4	4	3	4	3	4	4	4	**3,67**	
student 4 $B_{3,2}$	3	4	3	2	4	3	3	2	4	**3,11**	**3,08**
student 1 $B_{3,3}$	2	4	3	1	1	1	1	1	1	**1,67**	
student 2 $B_{3,3}$	4	4	3	2	3	3	2	3	2	**2,89**	
student 3 $B_{3,3}$	2	4	3	2	4	4	2	3	2	**2,89**	
student 4 $B_{3,3}$	3	4	4	3	4	4	4	4	3	**3,67**	**2,78**
student 1 $B_{3,4}$	2	4	4	3	3	3	4	2	2	**3,00**	
student 2 $B_{3,4}$	2	4	3	2	4	2	2	2	2	**2,56**	
student 3 $B_{3,4}$	4	4	3	3	4	3	3	3	4	**3,44**	
student 4 $B_{3,4}$	3	4	4	3	3	3	3	4	4	**3,44**	**3,11**
student 1 $B_{3,5}$	2	4	4	3	4	4	3	4	1	**3,22**	
student 2 $B_{3,5}$	-	-	-	-	-	-	-	-	-	**-**	
student 3 $B_{3,4}$	3	4	4	4	3	4	3	4	4	**3,67**	**3,44**
student 1 $B_{3,6}$	2	4	2	1	3	3	1	3	3	**2,44**	
student 2 $B_{3,6}$	3	4	4	2	3	3	3	2	3	**3,00**	
student 3 $B_{3,6}$	4	4	4	4	2	2	2	2	2	**2,89**	**2,78**
totals by question	**2,57**	**3,71**	**3,48**	**2,33**	**3,29**	**3,10**	**2,62**	**3,00**	**2,81**	**2,99**	

Initial – final questionnaires comparison class B_3

students	totals	totals by group	totals	totals by group	initial – final differences	initial – final differences by group
student 1 $B_{3,1}$	1,78		3,11		**1,33**	
student 2 $B_{3,1}$	1,56		2,44		**0,89**	
student 3 $B_{3,1}$	3,33		2,78		**-0,56**	
student 4 $B_{3,1}$	2,56	2,31	3,33	2,92	**0,78**	0,61
student 1 $B_{3,2}$	2,78		3,11		**0,33**	
student 2 $B_{3,2}$	3,11		2,44		**-0,67**	
student 3 $B_{3,2}$	3,22		3,67		**0,44**	
student 4 $B_{3,2}$	2,33	2,86	3,11	3,08	**0,78**	0,22
student 1 $B_{3,3}$	1,33		1,67		**0,33**	
student 2 $B_{3,3}$	2,75		2,89		**0,14**	
student 3 $B_{3,3}$	2,56		2,89		**0,33**	
student 4 $B_{3,3}$	3,22	2,47	3,67	2,78	**0,44**	0,31
student 1 $B_{3,4}$	2,11		3,00		**0,89**	
student 2 $B_{3,4}$	2,33		2,56		**0,22**	
student 3 $B_{3,4}$	3,56		3,44		**-0,11**	
student 4 $B_{3,4}$	2,89	2,72	3,44	3,11	**0,56**	0,39
student 1 $B_{3,5}$	2,22		3,22		**1,00**	
student 2 $B_{3,5}$	2,56		-		**-**	
student 3 $B_{3,4}$	3,56	2,89	3,67	3,44	**0,11**	0,56
student 1 $B_{3,6}$	2,11		2,44		**0,33**	
student 2 $B_{3,6}$	2,22		3,00		**0,78**	
student 3 $B_{3,6}$	1,89	2,07	2,89	2,78	**1,00**	0,70
totals by question	**2,54**		**2,99**		**0,45**	

Appendix D.3.3: Questionnaires full data - Class C_3

Initial attitude questionnaire class C_3

class C_3	1	2	3	4	5	6	7	8	9	totals	totals by groups
student 1 $C_{3,1}$	2	4	3	1	3	3	1	2	1	**2,22**	
student 2 $C_{3,1}$	2	3	2	1	2	2	1	1	2	**1,78**	
student 3 $C_{3,2}$	2	4	2	2	3	3	2	3	3	**2,67**	
student 4 $C_{3,1}$	1	1	1	1	2	3	1	1	2	**1,44**	**2,03**
student 1 $C_{3,2}$	2	1	2	1	2	3	1	2	4	**2,00**	
student 2 $C_{3,2}$	2	4	2	1	2	2	1	1	1	**1,78**	
student 3 $C_{3,2}$	1	2	2	1	3	4	1	2	1	**1,89**	
student 4 $C_{3,2}$	1	3	2	1	2	3	1	1	1	**1,67**	**1,83**
student 1 $C_{3,3}$	1	3	1	1	1	4	1	1	1	**1,56**	
student 2 $C_{3,3}$	3	3	3	1	3	3	1	3	2	**2,44**	
student 3 $C_{3,3}$	1	3	2	1	2	4	1	2	1	**1,89**	
student 4 $C_{3,3}$	2	3	3	1	2	3	1	2	3	**2,22**	**2,03**
student 1 $C_{3,4}$	1	3	2	1	3	3	1	1	2	**1,89**	
student 2 $C_{3,4}$	1	1	2	1	3	3	1	2	3	**1,89**	
student 3 $C_{3,4}$	1	3	2	1	2	4	1	4	2	**2,22**	
student 4 $C_{3,4}$	2	4	3	2	2	3	1	4	2	**2,56**	**2,14**
student 1 $C_{3,5}$	2	4	2	2	3	4	1	4	2	**2,67**	
student 2 $C_{3,5}$	1	4	3	1	3	4	2	3	1	**2,44**	
student 3 $C_{3,5}$	2	3	3	3	2	3	1	3	3	**2,56**	
student 4 $C_{3,5}$	2	4	2	1	3	3	1	2	3	**2,33**	**2,50**
student 1 $C_{3,6}$	3	3	1	1	3	3	1	2	2	**2,11**	
student 2 $C_{3,6}$	2	3	2	3	2	3	3	2	3	**2,56**	
student 3 $C_{3,6}$	3	4	2	3	3	3	4	4	4	**3,33**	
student 4 $C_{3,6}$	4	4	2	2	1	4	2	4	4	**3,00**	**2,75**
student 1 $C_{3,7}$	2	4	2	1	3	3	1	2	1	**2,11**	
student 2 $C_{3,7}$	1	4	2	1	2	3	2	1	1	**1,89**	
student 3 $C_{3,7}$	1	3	1	1	1	1	1	1	1	**1,22**	**1,74**
totals by question	**1,78**	**3,15**	**2,07**	**1,37**	**2,33**	**3,11**	**1,33**	**2,22**	**2,07**	**2,16**	

Final attitude questionnaire class C_3

class C_3	1	2	3	4	5	6	7	8	9	totals	totals by groups
student 1 $C_{3,1}$	4	4	3	2	4	3	3	4	3	**3,33**	
student 2 $C_{3,1}$	-	-	-	-	-	-	-	-	-	**-**	
student 3 $C_{3,2}$	2	3	3	2	4	4	3	4	3	**3,11**	
student 4 $C_{3,1}$	2	2	2	1	3	2	1	2	1	**1,78**	**2,74**
student 1 $C_{3,2}$	3	3	3	1	1	1	3	2	4	**2,33**	
student 2 $C_{3,2}$	2	4	3	1	3	3	3	2	1	**2,44**	
student 3 $C_{3,2}$	3	4	4	3	4	4	3	4	2	**3,44**	
student 4 $C_{3,2}$	2	3	3	1	3	3	2	3	1	**2,33**	**2,64**
student 1 $C_{3,3}$	2	3	2	1	3	2	1	1	2	**1,89**	
student 2 $C_{3,3}$	4	3	4	3	3	3	3	4	4	**3,44**	
student 3 $C_{3,3}$	4	4	3	2	4	4	3	2	4	**3,33**	
student 4 $C_{3,3}$	3	4	3	2	3	3	2	2	2	**2,67**	**2,83**
student 1 $C_{3,4}$	2	3	3	2	3	3	3	4	4	**3,00**	
student 2 $C_{3,4}$	3	4	3	2	4	3	3	4	3	**3,22**	
student 3 $C_{3,4}$	2	3	3	1	3	3	1	2	2	**2,22**	
student 4 $C_{3,4}$	4	4	3	3	2	4	3	4	2	**3,22**	**2,92**
student 1 $C_{3,5}$	3	4	4	2	4	4	3	4	3	**3,44**	
student 2 $C_{3,5}$	3	4	4	3	3	4	4	3	2	**3,33**	
student 3 $C_{3,5}$	3	3	4	3	3	1	4	4	4	**3,22**	
student 4 $C_{3,5}$	2	4	3	2	3	3	3	3	1	**2,67**	**3,17**
student 1 $C_{3,6}$	-	-	-	-	-	-	-	-	-	**-**	
student 2 $C_{3,6}$	2	3	3	3	2	2	2	3	4	**2,67**	
student 3 $C_{3,6}$	4	3	3	4	3	3	4	4	4	**3,56**	
student 4 $C_{3,6}$	4	4	3	3	2	3	3	4	4	**3,33**	**3,19**
student 1 $C_{3,7}$	2	4	3	2	3	3	3	3	4	**3,00**	
student 2 $C_{3,7}$	3	4	4	2	3	3	4	2	1	**2,89**	
student 3 $C_{3,7}$	2	3	3	2	1	2	1	1	2	**1,89**	**2,59**
totals by question	**2,80**	**3,48**	**3,16**	**2,12**	**2,96**	**2,92**	**2,72**	**3,00**	**2,68**	**2,87**	

Initial – final questionnaires comparison class C_3

students	totals	totals by group	totals	totals by group	initial – final differences	initial – final differences by group
student 1 $C_{3,1}$	2,22		3,33		**1,11**	
student 2 $C_{3,1}$	1,78		-		**-**	
student 3 $C_{3,2}$	2,67		3,11		**0,44**	
student 4 $C_{3,1}$	1,44	2,11	1,78	2,74	**0,33**	**0,63**
student 1 $C_{3,2}$	2,00		2,33		**0,33**	
student 2 $C_{3,2}$	1,78		2,44		**0,67**	
student 3 $C_{3,2}$	1,89		3,44		**1,56**	
student 4 $C3_{,2}$	1,67	1,83	2,33	2,64	**0,67**	**0,81**
student 1 $C_{3,3}$	1,56		1,89		**0,33**	
student 2 $C_{3,3}$	2,44		3,44		**1,00**	
student 3 $C_{3,3}$	1,89		3,33		**1,44**	
student 4 $C_{3,3}$	2,22	2,03	2,67	2,83	**0,44**	**0,81**
student 1 $C_{3,4}$	1,89		3,00		**1,11**	
student 2 $C_{3,4}$	1,89		3,22		**1,33**	
student 3 $C_{3,4}$	2,22		2,22		**0,00**	
student 4 $C_{3,4}$	2,56	2,14	3,22	2,92	**0,67**	**0,78**
student 1 $C_{3,5}$	2,67		3,44		**0,78**	
student 2 $C_{3,5}$	2,44		3,33		**0,89**	
student 3 $C_{3,5}$	2,56		3,22		**0,67**	
student 4 $C_{3,5}$	2,33	2,50	2,67	3,17	**0,33**	**0,67**
student 1 $C_{3,6}$	2,11		-		**-**	
student 2 $C_{3,6}$	2,56		2,67		**0,11**	
student 3 $C_{3,6}$	3,33		3,56		**0,22**	
student 4 $C_{3,6}$	3,00	2,96	3,33	3,19	**0,33**	**0,22**
student 1 $C_{3,7}$	2,11		3,00		**0,89**	
student 2 $C_{3,7}$	1,89		2,89		**1,00**	
student 3 $C_{3,7}$	1,22	1,74	1,89	2,59	**0,67**	**0,85**
totals by question	**2,18**		**2,87**		**0,69**	

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