

University exams at the time of Covid-19

The reactions of students between emotionality and cognition

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Abstract

This research aims to explore the reactions of students in the face of the pandemic emergency in progress, also in relation to the need and novelty of distance learning, a form in which there is no physical coexistence, in the classroom of teachers and students, and which mainly uses online tools.

We asked ourselves the following questions: What is the emotional impact in facing the exam tests? What awareness do students have of the role that emotions play so much in learning and testing processes in exams? The information that we have obtained is useful in the reformulation of our didactic proposal for its consolidation in a metacognitive sense. This is the result that we expect from the research as well as that of offering a contribution to the international debate regarding the changes that the onset of Covid will bring in the ways of addressing the verification of learning in the university environment.

The perspective is constructivist–cognitivist, but does not forget the hermeneutic epistemic framework that has always accompanied our studies. The methodological approach is, therefore, quantitative because it is based on the administration of a questionnaire and on the comparative analysis of the data that emerged; but it can also be defined as qualitative due to the relevance that the analysis of their qualities assumes, or rather of the relationships that exist between the data itself as between the latter and the context.

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The research theoretical context

Pandemic and life

The pandemic situation has changed not only social life and relationships in the strict sense, but also work activities and the world of education, involving students from the first grades of primary school to university. We believe that the emotional impact on knowledge construction processes is crucial.

In fact, the activity of the mind from which intelligence emerges consists in the interaction of thoughts, emotions, instincts, memories, sensations, sensory stimuli, in short, in the interactive relationship with the environment.

In summary, and simply, we can say that the mind is what the brain does¹.

Intelligence is '*solidarity*' that acts in the cognitive field and projects its dynamic effects on the neuronal aggregations of the brain. When intelligence moves, it is supportive, says scientist Patricia Churchland, because it is empathetic: '*it is the prefrontal cortex, with its connections to the emotional structures of the brain, that generates intelligence in human social behaviour*'².

¹ See Pinker, S. (1997). *How the Mind Works*. New York: Norton.

² Churchland, P. S. (2012). *Neurobiologia della morale*. Milano: Cortina, 2012, trad. it., *Braintrust. What Neuroscience Tells Us about Morality*, Princeton University Press, 2011, p. 144. On the subject, see also: Cozolino, L. (2008). *Il cervello sociale, Neuroscienze delle relazioni umane*. Milano: Raffaello Cortina Editore. Goleman, D. (1996). *Intelligenza emotiva*. Milano: Rizzoli.

In fact, emotions, whether they are aware, have a prolonged effect over time if they change into feeling and reach consciousness. That is to say that only with the clear perception of a sense of self does the subject come to the awareness of the feelings he feels. In this sense, and quoting a beautiful expression from Damasio, we can say that '*feeling is the mental experience of emotion*'³.

According to Damasio, consciousness amplifies the impact of feelings and emotions in the mind. Moreover, he claims that it is 'our first authorisation to know', and therefore '*helps us to perfect the art of life*'⁴.

And in fact, it is the conscience that makes known to the subject the feeling of an emotion. How? By making us aware of ourselves that, through the neural circuits of our brain, we process mental configurations such as concepts, ideas, images and shapes.

Emotions and feelings have a common biological basis. Emotions are chains of chemical and neural responses; therefore, they are biological processes that depend on innate brain devices. They represent a specific response to an inducing situation.

Pain and pleasure respond to the adaptive purposes of the biological programme; they signal a dysfunction, a danger, or the solution of a difficulty or the satisfaction of a need.

The ability to imagine what does not yet exist, or to predict the consequences of a given behaviour, implies the ability to predict the actions of others and to interpret their reactions, moods, feelings and intentions.

This is the empathic tension of intelligence, which fades into social competence and is nourished by an emotional tension.

We have seen how at the basis of the ability to understand the mental states of others, there are brain mechanisms that refer to mirror neurons⁵, which, it has been said, underlie the understanding of an intention or an end.

The neuronal mechanism that we could call '*empathic*', likely, is one of the biocognitive elements that underlie our social competences, our moral choices and the ability to make decisions because they would help us understand the intentions of our fellow men. My brain would imitate the outward signs of a state (e.g. of suffering or fear), making me feel part of the same emotion, and therefore recognising it. In short, the imitation circuit would simulate the emotional facial expressions of other subjects. This device belongs to the neurocognitive system underlying the understanding, prediction and management of relationships between individuals. This experience would affect the activity in the limbic system, an area in which the emotion associated with a given expression is perceived by observation⁶.

In short, knowledge – it has been said – also pertains to emotions and, with them, to intuitions. Both are in some way related to the nervous system as to experience, education and culture.

It is the sense of self that allows us to know that we feel an emotion, we feel a sensation and we experience a feeling. Moreover, the sense of self is one of the most powerful forms of representation of knowledge that exists because when we learn a datum, an event, a process and so on, the information we get from it is more articulated, acts more deeply and activates new areas of signification if it is associated with the self.

The sense of self does not only concern the organic set of knowledge we have of ourselves, but also underlying knowledge that is not always and not completely conscious, but which, nevertheless, acts in the plural and dynamic process that is the identity of the subjects.

The sense of self is a basis for the organisation of every activity, knowledge, behaviour, memory, experiences and emotions: it has to do with an explicit theory of the self, but is not limited to it.

In fact, it is very important in learning optimisation mechanisms because it can strategically help organise notions and knowledge that, otherwise, would be more disconnected.

The sense of self helps us to structure knowledge, to organise associative networks and to increase the links of signification. For this reason, metacognitive competence – knowing knowledge and how it works – should be a primary educational goal.

In this context, it was not intended to analyse the learning processes, or the teaching methodologies involved and called into question in a sudden way by the events, but we wanted to look at the influence on the emotional side that this situation has generated.

Emotions and learning, emotional Intelligence

The reflection on emotions has distant roots; as far as we are concerned, we have already felt a profound interest in the subject starting from the study of Descartes who, in *The passions of the soul* (1649), draws a dividing line between actions and affections, for which the former are dominated by the will, while the latter (perceptions, emotions and feelings) are completely involuntary and are produced in the soul by 'vital spirits', a term with which the French philosopher and scientist identifies mechanical forces that have a direct influence on the body.

The task of the soul is to dominate the emotions, since there can be no spiritual well-being, but one could say psycho-physical, if one is dominated by them. With this, Descartes does not at all affirm the harmfulness of emotions; on the

³ Damasio, A. R. (2003). *Emozione conoscenza*. Milano: Adelphi, p. 59.

⁴ *ibidem* p. 18.

⁵ See Rizzolatti, G. & Sinigaglia, C. (2006). *So quel che fai, Il cervello che agisce e i neuroni specchio*. Milano: Raffaello Cortina Editore.

⁶ See, Iacobini, M. (2009). *Neurobiology of imitation* in *Current Opinion in Neurobiology*, 19, 6, 2009, p. 663.

contrary, they encourage the soul to adopt the strategies that serve to maintain the body: sadness, for example, warns us of something negative that we must get rid of, through the scope of desire, while joy makes our soul certain of good and useful things for life, so much so as to orient the desire to 'love' and acquire them. He writes: 'Wisdom is mainly useful in teaching to make oneself totally masters of the passions and to use them with such prudence, so that the evils they cause are easily bearable, and even such that some joy is derived from everyone'⁷.

There is no doubt that there are elements of relative modernity in this 17th-century perspective, especially if we consider that the human sciences only manage to carry out a systematic study of the subject since the 90s of the last century. It can be said that continuity is given by the conviction that the study of emotions must serve not only for their understanding, but also for their use for the personal and social good. It is no coincidence that Daniel Goleman thus entitles one of his most famous works: Emotional Intelligence, what it is and why it can make us happy.

Descartes spoke of joy and Goleman speaks of happiness: demanding, risky and, nevertheless, important words. Moreover, in the 1990 paper, 'Emotional Intelligence', the scholars Salovey and Mayer referred to emotional intelligence (EI) as the ability to 'control' not only one's own emotions, but also those of others and mentioned to make distinctions between them to 'use' information to 'guide' thoughts and actions. There is no mention of happiness, but the desire to work for individual and social well-being is highlighted, thanks to an adequate regulation of the emotional equipment⁸.

Despite the differences, the scholars who dealt with the subject in the 90s use the terms aimed at describing the ability to identify, recognise and differentiate the forms of the emotional fabric to achieve objectives, thanks to their appropriate use. Hence, the desire to build models capable of detecting the 'emotional quotient' (EQ), or that of 'EI', or 'emotional leadership' (EL) has developed. Salovey and Mayer developed their own test for measuring EI (MSEIT), which, unlike the tests on the intelligence quotient (IQ), did not contain only the possibility of an objectively correct answer.

Should we talk about emotional education? For us, yes, if it is not a form of training, but an essential component of training, in general, alongside knowledge and methods, given that it performs a prominent social function. Only a keen attention to the emotional dimension, in fact, allows you to give space to the interior, to recognise and accept differences and to favour the free expression of oneself.

The difficulty for teachers consists in having to face not only the emotions emerging from the class group, but also their own, which intersect with those of others: the risk of getting lost is real. On one hand, it is necessary to accept the idea that emotions represent a natural component of everyone's life in the school institution; on the other hand it is also crucial to limit their scope and to consider the difference in role between teachers and students, avoiding confused and unsatisfactory outcomes. Of great importance, however, is the set of affective dynamics that can occur in a class group, when emotions truly become forms of learning facilitation, as evidenced by the common growth and maturation of the individual components. It can be grasped in the progressive involvement, in the growth of trust and understanding, in the quality of dialogue: signs that let us understand how emotions have found a happy possibility to manifest themselves and a reassuring freedom of movement.

The group, at this point, is a space for growth that gives everyone an element of identity 'in a continuous exchange with both peers and teachers, in which emotional and relational processes take on a central role'. Without emphasis, and far from any rhetoric, but convinced on an experimental basis of what we are saying, we believe that when the class becomes a group, through a large and tested work, it creates the potential of the spirit of belonging, of collaborative action, of availability to pool resources and synergies, with the aim of self-realisation that takes place with the qualified support of others.

It is the emotional side of our being that leads us to the hope of success and takes us away from the fear of failure. If the strength of emotions, in their translation into feelings and passions, makes the path to be clear and motivated, this does not at all exempt us from considering the needs of others. On the contrary, knowing how to understand synchronously their feelings, concerns and the need to listen strengthens with the empathic dimension of our humanity the quality of the motivation that makes us worthy of community life.

The most convincing result of a motivation that has been continuously cultivated is assertiveness, or self-affirmation. Emotional and social intelligence, properly deployed, translate into an evident ability to manage one's emotions, and one's point of view, without entering into conflict with others⁹.

Then, the real turning point occurs only with a courageous learning that teaches us to consider what is happening not only from the most elementary point of view, which has the consent of overwhelming majorities, but also by directing our gaze towards a hermeneutic plurality. In this way, it is possible to enhance the difference, overcoming the arrogant contempt of the different with an exercise of humility.

Being creative means assuming the three intelligences (cognitive, emotional, social) in a synergistic form to recalibrate a scale of values, which are today at least questionable. In making this commitment of intelligence their own, an uncomfortable question seems legitimate: why is the cause so much advocated, with authoritative voices, of a digital technol-

⁷ Descartes, R. (2003). *Le passioni dell'anima*, a cura di S. Obinu, Milano: Bompiani, 2003, III, 212

⁸ Salovey, P. e Sluyter, D. J. (1997). a cura di, *Emotional development and Emotional Intelligence: educational implications*, New York: Basic Books. See also Salovey, P. e Mayer, J. D. (1990). *Emotional Intelligence*, in *Imagination, Cognition, and Personality*, vol. 9, No. 3, New York: Baywood Publishing Co. Amityville

⁹ See Alberti, R. & Emmons, M. (2003) *Essere assertivi. Come imparare a farsi rispettare senza prevaricare gli altri*. Il Sole 24 Ore, Milano

ogy that changes thinking? We do not want to discuss, or investigate, whether this transformation represents an epochal turning point of great interest; rather, it would seem interesting to ask ourselves why this disruptive technology cannot coexist with other, and different, forms of thought that do not seem quite exhausted, however previous they may be, and can maintain their full meaning with dignity.

1. The Research

1.1 Experimental group

Information was collected on the state of mind that accompanies first-year university students in the days preceding the exam, an event that not only involves the learning aspect, but also the emotional aspect.

The emotional aspect, if already in non-emergency situations, has a significant influence on the ways in which the exams are dealt with; in a situation such as the pandemic one, it is significant where technology is added to interface with the assessment tests.

The purpose of this first data collection is to monitor which attitude is predominant with respect to the exam to improve my teaching proposal in all its aspects.

To have a clearer picture, and to relate the technologies as predominant in the training process and in the evaluation moment and the moods associated with the latter, a questionnaire was proposed to a course that is traditionally delivered in the presence and a course that is delivered in blended mode.

This choice allows a situation such as that created by the health emergency generated by the Covid-19 pandemic to have what can be defined as a control group, students of a blended course, because the technologies were already an integral part both in teaching and, albeit in part, in the evaluation methods.

The term control group is certainly not used here in the strict and classic sense of the term, but in the useful meaning of the control parameter to understand how much the technologies, used in a 'normal' way in the learning and evaluation process, may have been a factor of magnification or attenuation of the impact that the new situation has had in the context of the analysis.

Since it was intended to investigate an emotional field, the choice was made to use multiple choice grids, using semantic differential scales to be able to measure the profiles that emerge with respect to the intensity of sensations and emotions in this evaluation context inserted in this period history and the related social and relational implications that it brought with it.

With the same intent, for generation of profiles and perception of the pandemic situation and its influence on one's moods and on the approach to learning, semantic differential scales were still used to then highlight any relationships between sensations, emotions and perceptions linked to the conditions imposed by the pandemic.

The students interviewed are all in the first year, except one, and this allows us to start from the assumption that the impact with the university is a new sensation for everyone and that we can reasonably work on a direct correlation between the signification that is given to sensations and emotions and the impressions and moods related to the pandemic, always in the specific and declared context of the imminence of exams.

It should be noted that sensation is understood as it is classically defined as a 'state of consciousness as it is produced by a stimulus external or internal to the subject', and similarly, emotion is defined as 'affective and momentary psychic state which consists in the opposite reaction by the organism to perceptions or representations that upset its balance'.

1.2 Survey tools: the questionnaire

The questionnaire in detail asks students in the first area to evaluate on a scale from 0 to 5 the meaning and importance that a series of sensations (Table 1) and a series of emotions have for them (Table 2).

Table 1. List of sensations used in the questionnaire.

Uneasiness	Pessimism	Welfare
Bother	Curiosity	Fatigue
Serenity	Stress	Lucidity
Interest	Optimism	Indifference
Competence	Clarity	Confusion
Excitement	Boredom	

Table 2. List of emotions used in the questionnaire.

Fear	Competition
Happiness	Aridity
Envy	Coldness
Anger	Sharing
Solidarity	Solitude
Beauty	

A subsequent area aims to assess the conditions imposed by the pandemic in terms of sustainability and the degree of influence it has exerted on moods (Fig. 1); in particular, these values were deemed appropriate to detect them with self-anchoring ladders in which the self-evaluation criterion of the distance between the modes is usually more likely to occur.

From 0 to 5, how would you rate the influence of conditions imposed by the COVID-19 pandemic on your study performance?

	0	1	2	3	4	5
Understanding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Memorisation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Interest in the topic	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Confrontation with the teacher	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Comparison with fellow students	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Fig. 1. Evaluation of sustainability and influence on moods with respect to the conditions imposed by the Covid-19 pandemic. The questionnaires were administered in Italian.

The last area of the questionnaire explores how students perceived the influence of the living conditions imposed by the pandemic emergency on their performance in relation to studying.

Also, in this case, they were asked to evaluate on a scale from 0 to 5 the influence of the situation created by the pandemic on study performance by investigating five areas (Fig. 2); in particular, they were asked to evaluate the influence in relation to:

1. Understanding
2. Memorisation
3. Interest in the topics
4. Confrontation with the teacher
5. Comparison with fellow students

From 0 to 5 how would you rate the conditions imposed by the COVID-19 pandemic?

	0	1	2	3	4	5	
Sustainable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Unsustainable

From 0 to 5 how would you evaluate the influence on your moods, before the exam, by the conditions imposed by the COVID-19 pandemic?

	0	1	2	3	4	5	
No Influence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Great Influence

Fig. 2. Evaluation of the influence of the conditions imposed by the Covid-19 Pandemic on study performance. The questionnaires were administered in Italian.

Considering more strictly personal areas and pre-eminently relational areas such as the confrontation with the teacher and fellow students.

In this structural context, the general data are summarised in Table 3, where it is highlighted that both the experimental group, made up of students attending a course designed in the presence and the group that we can define as control, in relation to the fact that they belong to a course designed in blended methodology, they are made up of first year students (only 1 of the second and 1 of the third year), and reflect the composition of Pedagogy (presence) and training technologies (blended) courses.

Table 3. General student data.

	Course in presence	Blended course
Number of students	189	44
Males	10	10
Females	179	34
I year of the course	187	44
II year of the course	1	0
III year of the course	1	0

2. Results

2.1 Data analysis

We can now proceed with an analysis of the results, whose graphical representations are shown in Appendix A, starting from the results of the evaluation of sensations (Table 4) and feelings (Table 5) in the experimental group.

Table 4. Evaluation of the intensity of sensations in the context of a learning process, focused on the immediacy of the exams (experimental group – 189 subjects).

Sensations/value	0	1	2	3	4	5	Average value
Uneasiness	30	35	36	32	33	23	2.4
Bother	63	37	34	27	20	8	1.6
Serenity	28	53	59	33	12	4	1.8
Interest	2	16	35	45	50	41	3.3
Excitement	44	49	30	41	20	5	1.8
Pessimism	17	44	41	37	31	19	2.4
Curiosity	5	23	34	52	40	35	3.1
Stress	6	21	26	32	50	54	3.4
Optimism	18	62	43	42	19	5	2.0
Clarity	16	58	40	43	21	11	2.1
Boredom	75	53	27	21	7	6	1.2
Welfare	16	56	65	34	9	9	2.0
Fatigue	10	18	37	37	50	37	3.1
Lucidity	12	54	49	43	22	9	2.2
Indifference	117	44	16	9	2	1	0.6
Confusion	20	44	40	34	27	24	2.4
Competence	4	33	39	66	35	12	2.7

Table 5. Evaluation of the intensity of emotions in the context of a learning process, focused on the immediacy of the exams (experimental group – 189 subjects).

Emotions/value	0	1	2	3	4	5	Average value
Fear	10	22	36	50	41	30	3.0
Happiness	13	53	48	50	16	9	2.2
Envy	127	28	26	6	2	0	0.6
Anger	76	34	30	23	19	7	1.4
Solidarity	13	32	35	38	42	29	2.8
Beauty	42	32	46	36	21	12	2.0
Competition	73	42	40	23	6	5	1.3
Aridity	108	33	30	15	2	1	0.8
Coldness	90	44	26	18	6	5	1.1
Sharing	21	30	37	45	28	28	2.6
Solitude	41	47	38	28	16	19	1.9

A first analysis of these results, relative to the experimental group, highlights how, among the sensations, stress is the one evaluated in a preponderant way, with an average of 3.4, and also interest with an average of 3.3 and curiosity with an average of 3.1 represent the most perceived sensations, especially when an exam is approaching.

As might have been expected in a situation imminent for an exam, fatigue is also significant (average of 3.1), but considering ‘stress’ at the top of this ranking, this is a confirmation of a picture consistent with the imminence of an exam.

Immediately above the average of 2, we find pessimism, optimism and confusion, indicating a fluctuating perception of reality as a function of the upcoming examinations, but here it is possible to hypothesise a strong correlation with the environment and the conditions imposed by the pandemic.

In any case, it is good to note that the influence and perception of these sensations are not at high levels.

2.2 Data evaluation of the experimental and control groups

Finally, among the sensations, it is interesting to note how indifference, with an average of 0.6 and as many as 117 subjects who attributed a value of 0, is the least present sensation, a factor that could also testify to the validity of the analysis of these sensations, certifying the fact that subjects are attentive to their actions and their surroundings.

In the analysis of feelings, the two elements that can be highlighted are three (maximum average) of fear with a Gaussian distribution of values and 0.6 being the minimum value, of envy. In particular, 127 subjects (about 70%) attributed the value 0 to the envy and 108 subjects evaluated dryness as 0 (8.0 on average).

In this overall analysis, it is interesting to note how all the other feelings are evaluated in a sort of norm (values that oscillate around the average of 2), but above all, how they are not evaluated in terms of intensity of competition, dryness and coldness.

Lastly, also in a perspective of the pandemic situation and a decrease in social relationships, it is ‘consoling’ to see how low the intensity of loneliness is (1.9 is the average) with 126 subjects who rated it 0–2 (67%).

Let us now consider the results of the evaluation of sensations (Table 6) and feelings (Table 7) in the control group.

It is immediately noted that the results are like those seen for the experimental group. In this case also, it is indifference again with an average of 0.6, which is considered the least intense sensation, and the most intense is fatigue (3.7) followed immediately by stress (3.5).

In any case, the scale of the results is comparable to that found in the experimental group, allowing to express and confirm the same assessments and the same interpretations relating to the intensity of the sensations and their correlations with the periods prior to the exams.

As far as feelings are concerned, the discourse is slightly different, without prejudice to the last place of envy, solidarity (3.2) and sharing (3.1) are still with an average of 0.6 greater, and fear, albeit evaluated with good intensity, is 2.8 on average.

In this context, it being understood that the overall analysis of the results confirms the evidence highlighted for the experimental group; in a blended course accustomed to a part of interaction through technologies, the fear associated with them is less and more sense of solidarity and collaboration to balance an interpersonal relationship that is lower in percentage and qualitatively different from completely face-to-face courses.

This first part of the analysis, therefore, confirms that the intensity of feelings and sensations perceived and evaluated in relation to the days immediately preceding the exam is in line with the dynamics that the situation triggers more than the context.

The only difference is the introduction of technologies, which has highlighted the sense of fear towards the exam, a deduction that seems confirmed by the fact that the fear has not been evaluated with an equal intensity by students who have technology as an integral element of their course of study.

Let us now examine the relationship and the influence perceived by students between the moods before the exams and the conditions imposed by the pandemic.

Table 6. Evaluation of the intensity of sensations in the context of a learning process, focused on the immediacy of the exams (control group – 44 subjects).

Sensations/value	0	1	2	3	4	5	Average value
Uneasiness	6	7	11	8	6	6	2.4
Bother	15	11	7	4	3	4	1.6
Serenity	7	12	14	7	3	1	1.8
Interest	1	5	8	9	12	9	3.2
Competence	1	10	7	15	8	3	2.6
Excitement	12	10	9	6	3	4	1.8
Pessimism	4	11	9	4	7	9	2.6
Curiosity	4	4	7	12	13	4	2.9
Stress	0	3	8	10	9	14	3.5
Optimism	7	18	6	8	3	2	1.7
Clarity	3	14	12	11	3	1	2.0
Boredom	19	7	7	8	2	1	1.3
Welfare	6	18	11	5	2	2	1.7
Fatigue	0	1	8	10	8	17	3.7
Lucidity	8	10	8	11	5	2	2.0
Indifference	27	9	7	1	0	0	0.6
Confusion	5	11	8	10	5	5	2.3

Table 7. Evaluation of the intensity of emotions in the context of a learning process, focused on the immediacy of the exams (control group – 44 subjects).

Emotions/Value	0	1	2	3	4	5	Average value
Fear	2	7	9	14	4	8	2.8
Happiness	8	10	12	8	2	4	2.0
Envy	32	6	3	0	1	2	0.6
Anger	21	8	5	4	2	4	1.3
Solidarity	1	4	11	8	8	12	3.2
Beauty	6	13	5	11	5	4	2.2
Competition	19	13	6	3	3	0	1.0
Aridity	27	9	3	3	0	2	0.8
Coldness	23	6	6	4	2	3	1.2
Sharing	4	5	7	5	14	9	3.1
Solitude	10	8	9	6	5	6	2.1

The data that reveal the evaluation of the conditions imposed by the pandemic (Table 8), which we can undoubtedly group, in this context, based on the change of exam modalities and the modification of student–teacher and student–student collaborative practices, are consistent in the two groups.

The average evaluation that is given highlights an impact that is mediated or attenuated by the awareness of the need that is generated the conditions, and above all, by the fact that the conditions are dictated by a health and global emergency.

Table 8. Evaluation of the conditions imposed by the Covid-19 pandemic.

	0	1	2	3	4	5	Average value
Experimental group	12	20	44	67	35	11	2.6
Control group	3	9	8	17	6	1	2.4

It, therefore, seems that there is an evaluation of an ‘average’ impact, most likely conveyed by the state of necessity. Despite this awareness, which makes the conditions imposed by the pandemic not ‘excessive’, awareness of the emotional impact that these conditions have on moods is relevant.

By correlating with the data relating to moods and feelings, the influence seems to be on intensity and not specifically on the ‘ranking’ of importance.

This becomes more evident when analysing the data (Table 9) determined by the question (Fig. 1) relating to the evaluation of how and to what extent the moods before the examination were influenced by the conditions imposed by the pandemic.

2.3 Reflection on the data

In both groups, the average index is very high (3.6 for the research group and 3.1 for the control group): this data underlines the intensity produced in the moods that are normally experienced before the exams.

The distribution of responses is comparable with values that are over 3 and a very low number of subjects who do not perceive this influence.

Table 9. Assessment of the flu on moods before examination by the conditions imposed by the Covid-19 pandemic (control group – 44 subjects).

	0	1	2	3	4	5	Average value
Experimental group	3	7	5	7	56	54	3.6
Control group	3	9	8	17	10	12	3.1

It can be said without a doubt that the range of sensations and feelings, while showing a substantial distribution on a scale of importance in line with the analysis of the period immediately preceding the exams, is widened by the conditions imposed by the pandemic.

This magnification must be read in terms of generating greater obstacles with respect to the motivation for active learning, pushing in the direction of didactic methodologies that, in a flexible way, fill the emotional gaps generated in periods of emergency.

It is necessary to always think about the tools and methodologies not used to overcome periods of development, but are adaptable to the environment, a fundamental element for the learning dimension.

The last analysis is dedicated to the final question relating to the evaluation of the influence of the conditions imposed by the Covid-19 pandemic on the study performance and the results obtained for the research group (Table 10) and for the group control (Table 11).

The data show a perceived influence in different areas, but not in a strongly decisive way; even if it is a general influence, the average data are similar in all areas.

An exception is the interest in topics which appears to be the area least affected by the pandemic conditions and is also the area least ‘touched’ by a substantial change in interpersonal relationships.

Table 10. Evaluation of the influence of the conditions imposed by the Covid-19 pandemic on study performance (research group – 189 subjects).

Performance/value	0	1	2	3	4	5	Average value
Understanding	23	27	47	53	30	9	2.4
Memorisation	29	30	49	42	21	18	2.3
Interest in the topics	36	37	38	46	23	9	2.0
Confrontation with the teacher	32	27	34	39	28	29	2.4
Comparison with fellow students	36	24	38	39	24	28	2.3

In fact, you can see a proportionality of impact between the relational areas, comparison with the teacher and classmates and understanding and memorisation, which is often the result of comparison and discovery of relationships.

These analyses are confirmed by the trends also highlighted by the data collected from the control group (Table 11), where an increase in the difficulty of memorising and comparing with companions should be emphasised, but which overall highlights how the pandemic situation is due to the decrease in social relations which, due to the increase in the use of technologies, has highlighted the need to change the perspective of the learning–teaching process.

Table 11. Assessment of the influence of the conditions imposed by the Covid-19 pandemic on study performance (control group – 44 subjects).

Performance/value	0	1	2	3	4	5	Average value
Understanding	5	8	7	14	4	6	2.5
Memorisation	5	6	4	8	12	9	3
Interest in the topics	9	7	7	10	6	5	2.3
Confrontation with the teacher	6	13	7	10	3	5	2.1
Comparison with fellow students	5	6	11	4	10	8	2.7

The choice to focus the analysis on the period immediately preceding the exams is because it is a privileged moment not only for verifying learning, but also for an overall analysis: it could deal with the entire process of teaching and learning, not only taking into account the learning outcomes, but also the emotional and cognitive components of involved people.

Conclusion

This first exploratory research must be prodromal to the construction of meaningful structures that allow teachers to govern the learning–teaching processes in their being ‘fluid’ in a continuous relationship with the student’s ego and the environment with all its components.

From this study, it emerged with further clarity how the transformative dialogue between the paradigms of scientific research of a cognitive and neurobiological matrix and those of educational knowledge could help us to redefine an epistemological framework, that is likely to be more humble and more complex, capable to integrate the interesting and revolutionary discoveries of technoscientific development.

Finally, we believe that as Fraunfelder and Santoianni¹⁰ underline, this perspective can help the subject, let us think of the student, but also of the teacher and above all the researcher, to monitor their own cognitive resources.

This research reaffirmed that the awareness of a large part of one’s own metacognition, the exploration of the prejudicial implications, of the implicit Batesonian epistemologies, of the direction of gaze, is an educational goal of extreme importance.

From a strategic point of view, we believe it is essential to promote practices that activate the formation of connective thinking, or rather of a cognitive posture that seeks the connections of meaning, which refines a relational sensitivity.

The awareness of the cognitive role that emotions play in facing a university exam prepares the circumstances in which the subject learns how to deal with a question, to solve a problem, in a word: to make his mental representations more complex.

The education of emotions, therefore, helps to modify – not only in the sense of enriching, but also of revolutionising – the way of thinking and sometimes, to also change ideas around rooted or prejudicial beliefs, and often not very effective in dealing with reality, as in resolving the issues.

The aim is to train a competent intelligence. What must a person with competent intelligence do? He must be able to activate previous knowledge to improve those cognitive habits that represent an obstacle to solving problems.

A cognitive style that favours uniqueness in the face of pluralities and a thought that does not contemplate its own reconfigurations in the face of novelty are not the determinants of a competent intelligence.

The research illustrates how a pedagogy of emotions can prepare a mental change that, to the extent that it becomes aware, encourages and enhances the metacognitive dimension of what is learned, in the sense that it activates new knowledge, new strategies, new procedures, and therefore new configurations of ideas.

This is what we have tried to suggest in the experimentation that we have wanted to document in these pages, and this is what, to a certain extent, albeit at different levels of complexity, we have achieved in our experience.

The educational proposal, therefore, is in the experimentation of educational practices that help us in identifying the constants between similar processes and in keeping the fundamental phases of a cognitive path under control, starting from the emotional dominant.

All this has taught us that it is time to make our aphorism by Nietzsche, ‘Who has a strong enough why can overcome any how?’

¹⁰ See among others:

Fraunfelder, E., Santoianni, F. & Striano, M. (2007) *Introduzione alle scienze bioeducative*, cit.; Santoianni, F. *La fenice pedagogica. Linee di ricerca pedagogica*. Napoli: Liguri.
 Santoianni, F. & Striano, M. (2000). *Immagini e teorie della mente*. Roma: Carocci.

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