sciendo

Research on Education and Media
Vol. 15, N. 2, Year 2023
ISSN: 2037-0830 – DOI: 10.2478/rem-2023-0021

An explorative study of discipline-specific reorganization of assessment during educational emergency – An Italian case

Maka Eradze[a], *Andrea Tinterri*[b], *Anna Dipace*[c], *Delio De Martino*[d]

[a]*Università degli studi di l'Aquila, Italy. Maka.eradze@univaq.it, https://orcid.org/0000-0003-0723-1955*
[b]*Università degli studi di Modena-Reggio, Italy, andrea.tinterri@unimore.it, https://orcid.org/0000-0001-5891-505X*
[c]*Università degli studi di Foggia, Italy, anna.dipace@unifg.it, https://orcid.org/0000-0001-9826-073X*
[d]*Università degli studi di Foggia, Italy. delio.demartino@unifg.it, https://orcid.org/0000-0003-3107-1816*

Abstract

A coronavirus disease (COVID)-related educational emergency is believed to have changed some of the aspects of the educational landscape. Sudden changes to traditional structures that are schools are undoubtedly an interesting issue to explore: complex phenomena such as assessment methods are highly related to many different factors such as normative base, the use of technological tools, etc. This article reports on the reorganization of assessment methods in the context of a rapid and forced transition to remote teaching mode, based on the results of a survey of Italian teachers. Findings indicate that pandemic-related educational emergency and the push toward the use of tools in teaching and learning practices, and the corresponding relaxation of certain established frames of operation, have created grounds for alternative forms of assessment. Results show that when entertaining different options and enjoying some level of autonomy, teachers can explore alternative forms of assessment. Assessment methods also change according to school subjects; while assessment changes are discipline specific, there is a clear trend toward product-based assessment.

Keywords: *assessment methods, information and communication technology, teacher autonomy*

Introduction

It has been argued that the coronavirus disease 2019 (COVID-19) pandemic has altered the educational landscape. What has been called an educational emergency (Author et al., 2021) was, in principle, the challenge of mere access to education, needing an immediate response. Around the globe, an unprecedented scale of remote teaching called Emergency Remote Teaching (ERT) (Hodges et al., 2020) has been deployed to answer this immediate need. While the experience has been very challenging for the teachers, it has also introduced some opportunities, specifically for the professional development of teachers, as is well documented in previous research (i.e. Beardsley et al., 2021; Author et al., 2021; Johnson et al., 2022; Luik & Lepp, 2020). Researchers have reported on ERT all over the world (Bozkurt et al., 2020) capturing experiences (Albó et al., 2020), studying teachers' attitudes (Giovannella et al., 2021), changes in motivation, and digital skills (Beardsley et al., 2021), and also identifying potential professional development opportunities for teachers (Albó et al., 2020; Luik & Lepp, 2020).

The challenge of the pandemic was also organizational – an immediate challenge to quickly reorganize teaching and learning processes using educational technologies and in a different special dimension remotely. In this transitional process, the assessment reorganization became one of the most pressing issues. As some of the assessment practices, such as *assessment for learning* (Wiliam, 2011) and *assessment of learning* (Harlen, 2007) are often related to the assessment of the achieved outcomes and are aligned with state curriculum, in the disruptive context of COVID-19 emergency, this factored in the difficulty of the assessment reorganization management. Furthermore, while other types of learning activities are more flexible to reorganization, several issues must be considered when reorganizing the assessment processes, including academic integrity and trust (Gamage et al., 2020). This is further complicated using technology-enhanced assessment – its tools and some practices existed before the pandemic, but they have been

adopted very quickly, without much planning ahead, on distance, which was unprecedented, without much previous experience at scale (Farmer et al., 2020).

COVID-19 educational crisis has been conceptualized in three phases: disruption, transition and re-imagining, and seeing opportunities for reorganization in the current emergency (Fullan et al., 2020). We argue that it is important to explore COVID-19–related disruptions and educational reorganization processes., especially in the context of the use of technologies (Author et al., 2021; Rapanta et al., 2021). The authors of this article have previously examined the case of Italy in the context of assessment practices during ERT, in multiphase research, stemming from an ethnographic study of Italian teacher online communities (Author et al., 2021). This research has shed light on significant assessment *reorganization uncertainties* and related *reorganization opportunities* emerging in the teacher peer-learning communities. Following this study, we have created a survey to explore possible changes in the assessment practices in the context of COVID-19 disruptions and revealed the issues such as teachers' beliefs about the importance of assessment before and after the pandemic, the use of remote assessment before the pandemic, and assessment reorganization following the pandemic (Author et al., 2021). There is evidence of significant reorganization of assessment during the COVID-19 educational emergency in all school orders (Author et al., 2021): through all school orders, teachers perceived a reduction in the importance of assessment during the pandemic and, consequently, used most assessment techniques significantly less than before. However, different methods changed differently, with oral examinations diminishing dramatically and closed-question quizzes becoming increasingly used. This article reports further results of the survey and tries to uncover some changes related to the reorganization of assessment according to different disciplines.

1. Context, background, and related research

An integral part of pedagogical planning, educational evaluation, accompanies and regulates action and supports learning processes. There are several types of evaluation. Initial or diagnostic evaluation takes place at the initial stage of the teaching–learning process and aims at verifying the starting level of the students. Since the official birth, in June 1922, of the science that studies exams, examiners, and examinees, thanks to Henri Laugier, Henri Piéron and his wife (Martin 2002, p. 188), the main idea was that the examinations had to ascertain not only the acquisition of knowledge, but also the individual aptitudes, taking into account the sociological variants (age, sex, etc.). The formative or intermediate assessment is often referred to as an assessment for learning and takes place during the entire teaching–learning process – in this case, the improvement of the pedagogic action is at its core; it can be carried out both by the teacher and by the student as a self-assessment process (Guasti, 2013). The intermediate evaluation is the most important for the entire teaching–learning process and is carried out both by self-assessment (Pastore, 2019), peer assessment, and by teacher or external evaluators. The final evaluation at the end of the teaching–learning process testifies to the success of didactic action. In the Italian context, many subtle reflections on evaluation were before 2020 and are still valid: objectivity, reliability, as an antidote to various conditionings due to emotions, prejudices, preconceptions, validity (synchronic and diachronic), distortions, the so-called "effects" ("halo," "stereotype," "Pygmalion"), evaluation as an uninterrupted support of the learning process of the student (Author et al., 2021), and the articulation in three phases (all three fundamental). Paradigms and epistemologies of evaluation (positivist, pragmatist, constructivist, assessment driven, hermeneutic) have divided education experts, psychologists, and assessment experts over the decades. Furthermore, a delicate moment in the life of teachers, students and their families, evaluation has been made even more problematic by the COVID-19-related educational emergency.

Following the spread of COVID-19, Italy was the first European country to announce national lockdown, closing its schools by March 2020 until the end of the school year; this decision immediately replaced face-to-face teaching with distance education. The term "distance learning" is already mentioned in the presidential decree of the Council of Ministers of February 25, 2020, further reinforcing provisions of the decree-law February 23, 2020, n. 6. It contained urgent containment and management measures of the epidemiological emergency from COVID-19.

In general, evaluating at a distance is an even more difficult action than in normal times; the complexity of this issue increases, if we consider, that even though there is an established field of technology-enhanced assessment (Bennett, 2015), the assessment methods have not been previously used in primary and secondary education as much, especially, in the Italian scenario. Also, the essential starting point of distance assessment is represented by the regulatory dimension; it has been argued that the pandemic had a magnifying glass effect on the field of educational technologies Author, 2022; Author et al., 2021), revealing the potential of opportunities and uncertainties in the use of tools. Building on the existing framework by Secchi and Cowley on organizational cognition (Secchi & Cowley, 2018, 2021), the authors have previously stated that what happened during the lockdown was the temporary suspension of certain institutional frames (chiefly, the traditional organization of teaching and learning around in-classroom activities), which are situated at the so-called macrolevel – the organizational layer where patterns of collaboration, frames, expectations, etc. become crystallized and are enforced. This suspension had become a major cause of disruption in the education system, but it also allowed teachers and other educational stakeholders to experiment with alternative ways of organizing teaching and learning with the help of digital technologies. The temporary suspension of certain macro-frames enabled teachers and other educational stakeholders to entertain certain options, which, otherwise, they would not have been able to. For example, the fact that the prescribed frames could not be applied (at least temporarily) showed that the transformative potential of digital technologies does not happen in a vacuum, nor can digital technologies be treated independently from the context.

To exemplify this statement, with note 388 (03/17/2020), the Ministry of Education provided the first recommendations for distance learning, where we have some but not highly rigid indications on planning of exactly the learning processes. As far as evaluation is concerned, the Ministry gave some frames; however, still general, pushing toward the exploration of alternative modes such as formative assessment, the process had to consider the operational context, organizational difficulties, situation of families, needs of students in the time of uncertainty and insecurity.

The most important pre-COVID-19 references were as follows:

- Presidential decree (n. 122 del 06/22/2009 p. 2) underlined that the object of the evaluation should concentrate on the learning process, behavior, and overall academic performance of the pupils. Furthermore, the decree reiterates the formative purpose of the assessment and self-assessment of the students.
- Legislative decree (no. 62 of 04/13/2017 p. 71) reaffirms the formative and educational purpose of the evaluation and identifies the formative process as the main object of the evaluative action.

The pandemic, however, has given a strong jolt to the evaluation that, especially in the school environment, had survived as a necessary procedure, but was little loved by both teachers and students and families. The forced and prolonged use of distance learning has led to an equally frequent recourse to distance evaluation. More than the many decrees of The President of the Council of Ministers on "distance learning," the ministerial Note 388 of March 17, 2020 is important. It explicitly states the necessity of "constant evaluation activities," and that the "common sense of teaching must inform any evaluation activity [...]". In other words, at the normative level, evaluation was regarded as still crucial; however, formative evaluation was preferred.

As the post-covid studies show (Bonaiuti & Dipace, 2021; Guasti, 2013; Author et al., 2021), the pandemic has accentuated the crisis of summative, certifying, result-oriented evaluation and accelerated the transition to alternative and formative evaluation. The classic ex-post evaluation methods taken for granted have clashed with the emergence of new phenomena, such as that of cheating already from the first cycle of education appears to pose new problems (Grion et alii, 2020, p. 78). A reorganization of assessment in primary and secondary teaching (Author et al., 2021), therefore, becomes urgent. This panorama is framed in the research in progress on the homogenization of assessment practices by disciplines produced by the pandemic effect. The pre–COVID-19 regulatory framework has so demonstrated its value also in distance learning situations, as the focus in ministerial documents is and has always been formative evaluation – a type of evaluation consistent also with the pedagogy mediated by technologies. This article focuses on investigating the assessment practices in Italy during the COVID-19 educational emergency and on the lessons learned from these experiences in the context of discipline-specific assessment methods.

2. Methodology, research questions, and data analysis

Author et al. (2021) followed an ethnographic study in teacher online communities that was realized in the period of May–June 2020 with a large-scale survey that was diffused within those same communities to understand the most prominent assessment practices before and during the pandemic emergency as well as highlight potential trends of rearrangement of assessment practices. The survey included questions about teachers' demographic situation, self-judgment concerning their expertise with digital tools, experience with digital tools, competence with digital pedagogy, and other questions concerning pandemic-related aspects of teaching. In particular, the survey asked questions specifically concerning the frequency of use of specific assessment practices before and during the pandemic, which are used for the analysis in the present study. The survey was diffused within the online communities as described by Author et al., (2021).

We excluded kindergarten teachers from the present study to focus only on compulsory education teachers. Furthermore, we took into consideration only answers which included complete indications of their preference in using specific digital tools both before and during the pandemic (no missing data); this reduced the total number of surveys examined to 3590. To estimate the relative use of assessment strategies (Tables 1 and 2), we subtracted the mean value of assessment (the sum of all values given to individual assessment strategies divided by their number) from the values of individual assessment strategies. This way, we removed potential biases due to disciplines (which, as Table 3 demonstrates, have significantly different mean values for assessment) and could compare the relative frequency of individual assessment strategies before and after the pandemic, irrespective of the overall trend of reduction in assessment practices that we reported in our previous study (Table 4; see also Author et al., 2021).

For this specific study, statistical analysis was performed with Statistical Package for the Social Sciences (SPSS) 27.0. Since not all assumptions of equal variance were respected, we used nonparametric Kruskal–Wallis H to test the relative frequency of assessment methods before and after the pandemic (Tables 1, 2, and 4). We used the Pearson Chi-square test to test the significance of nominal answer distribution. We used Spearman's rho to test nonparametric correlation (or association) between variables. Unless specified, all results reported are statistically significant within a 95% confidence interval. In all tables and text, values are presented as means ± standard deviation. The main research questions this article answers are the following:

RQ 1 Did RT allow for experimenting with new assessment practices?
RQ 2 Did RT mostly exacerbate previous trends?

RQ 3 Did the COVID-19–related educational emergency bring reorganization of assessment practices?
RQ 4 Were assessment strategies reorganized differently across disciplines?

3. Results

We previously reported that, during COVID-19, teachers universally reported a reduction in both the use and perceived relevance of assessment (Author et al., 2021). We also reported that individual assessment strategies varied heterogeneously before and during the pandemic, paving the way for a more thorough investigation of possible reorganization of assessment practices. We, therefore, sought to investigate predating differences in assessment strategies across disciplinary areas to understand whether, depending on that, reorganization of assessment practices followed common trends or specific patterns. We sorted the survey respondents by disciplinary group (Table 5), the most represented being Italian language (Group 1, 27.3%), mathematics (Group 5, 18.9%), and foreign languages (Group 2, 12.0%). A significant number of respondents did not fall into any specific discipline and were classified as "Others" (Group 8, 27.4%). We found that, even before the pandemic, disciplinary groups were characterized by different use of assessment strategies.

On average. science and technology used assessment strategies the most (M = 3.03 ± 0.67), followed by foreign (M = 3.00 ± 0.73) and Italian languages (M = 2.99 ± 0.77), whereas physical education teachers (M = 2.71 ± 0.71) used fewer assessment strategies (Table 3). The most striking difference between disciplines concerned the use of problem-solving. This was the most frequent assessment method in mathematics (+0.54 ± 0.78) and, to a lesser degree, often employed in science and technology (+0.09 ± 0.95). Conversely, in Italian (-0.48), foreign languages (-0.70), and humanities (-0.48), problem-solving strategies were much less common than other strategies (Table 3). Other significant differences concerned the use of open questions, which were, in general, more frequent in the Italian language (+0.24), foreign languages (+0.39), and humanities (+0.26) than in science and technology (-0.05). Music and arts were distinguished by being the only disciplinary group that presented a relatively high use of product-based assessment strategies (+0.20), whereas humanities differed by the frequent use of collective examination (+0.20), which was very seldom used in science (-0.53) and mathematics (-0.21). All in all, the prepandemic picture was rather heterogeneous, beyond the transversal popularity of individual examination as the main strategy of assessment.

We then looked at the nonparametric correlation of different assessment methods to understand which were most likely to be employed by the same teacher. Predictably, all assessment methods were significantly associated with each other (Table 4). The strongest association concerned semi-structured tests and products (+0.510); there were similarities between the two as they are among the most elaborative methods and were ranked as the overall less-used strategies. The second strongest association concerned closed and open questions (+0.453), which were both relatively popular assessment methods, although with some differences across disciplines (Table 3): music and arts and physical education teachers employed on average closed more than open questions, whereas the opposite was true for languages (both Italian and second languages). Other strong associations included open questions and both semi-structured tests (+0.407) and individual examinations (+0.426), as open questions can be a part of those. Finally, individual examinations were strongly associated with group examinations (+0.376), indicating that teachers employed both depending on the situation; however, some disciplines strongly favored the first over the second, as is the case of mathematics and science and technology (Table 3).

The first observation is that variability was higher for almost all cases examined (Table 4), indicating that more freedom for teachers' initiative resulted in more variability in the use of methods of assessment. Concerning disciplinary areas, we found that Italian and foreign languages showed a similar pattern of reorganization. Here, teachers resorted more to closed questions (+0.16 and +0.15, respectively) and products (+0.13 and +0.12, respectively) and significantly reduced the use of individual examinations (-0.15 and -0.16, respectively), even though, overall, they remained the most employed strategy. The product-based assessment was also increased in humanities (+0.22), which almost completely foregoes problem-solving strategies (-0.20). Music and arts saw a significant reduction in collective examinations (-0.24), presumably because of the difficulty in organizing group works and sessions; teachers relied more on products (+0.19) which became their most employed assessment strategy. Mathematics showed a series of reorganization trends: reduction of problem-solving (-0.21), which was surpassed by closed questions (+0.19) as the most prevalent assessment strategy. Individual examinations showed a significant reduction (-0.24), whereas products, which were previously very seldom used, increased (+0.22). In science and technology, we observed a reduction in the most popular practice, individual examination (-0.17), mostly in favor of products (+0.16).

Nonparametric correlations (Table 1) mostly confirmed previous association trends. Furthermore, pandemic-specific video calls and online tests were positively associated (0.410), indicating that teachers used both at the same time. Interestingly, online tests were more strongly associated with closed questions (0.358) than with other assessment methods, indicating that online tests could often comprise quizzes. Video calls had the strongest positive association with individual examinations (0.271), which suggests that they were often used in combination.

Discussion and conclusions

As stated in previous chapters, this article is contextualized in a larger ethnographic study (Author et al., 2021), which revealed patterns of reorganization in the context of a COVID-19–related educational emergency. An additional survey was administered to explore possible changes in the assessment practices; partial results from this survey showed a signif-

icant reorganization of assessment in all school orders (Author et al., 2021). We also reported that individual assessment strategies varied heterogeneously before and during the pandemic, paving the way for a more thorough investigation of possible reorganization of assessment practices. We, therefore, sought to investigate predating differences in assessment strategies across disciplinary areas to understand whether, depending on that, reorganization of assessment practices followed common trends or specific patterns. This article reports on the survey, trying to uncover changes related to the reorganization of assessment according to different disciplines.

In this analysis, we found that, even before the pandemic, disciplinary groups were characterized by different use of assessment strategies. To sum up a general trend for the assessment strategies pre-COVID, our findings suggest that, on average, science and technology teachers made higher use of assessment strategies compared to their peers of other disciplines, followed by foreign and Italian language teachers. Conversely, physical education teachers were the ones that employed fewer assessment strategies. When comparing assessment strategies, the most striking difference between disciplines concerned the use of *problem-solving strategies*. This was the most frequent assessment method in mathematics and, to a lesser degree, was often employed in science and technology. In Italian and foreign languages and humanities, *problem-solving strategies* were much less common than other strategies. Other significant differences concerned the use of *open questions*, which were, in general, more frequent in Italian and foreign languages and humanities than in science and technology. Music and arts were distinguished by being the only disciplinary group that presented a relatively high use of *product-based* assessment strategies, whereas humanity studies differed by the frequent use of collective examination, which was seldom used in science and math. To sum up, the prepandemic picture depicts a rather heterogeneous picture, beyond the transversal popularity of individual examination as the main strategy of assessment. Semi-structured tests and products were among the most elaborative methods and pre-COVID, they represented the least used strategies. *Closed* and *open questions* were relatively popular assessment methods, although with some differences across disciplines. Music and arts and physical education teachers employed on average *closed* more than open questions, whereas the opposite was true for languages (both Italian and foreign languages). Other strong associations included *open questions* and both *semi-structured tests* and *individual examinations* as *open questions* can be a part of those. Finally, *individual examinations* were strongly associated with group examinations, indicating that teachers employed both depending on the situation; however, some disciplines strongly favored Italian over the foreign language, as is the case for mathematics and science and technology.

As far as the postpandemic reorganization goes, in all cases, we can observe that the relaxation of certain established frames of operation and the use of tools resulted in the reorganization of methods and modes of assessment. For instance, Italian and foreign languages showed patterns of reorganization: teachers resorted more to *closed questions* and *product-based assessment* and significantly reduced the use of *individual examinations,* even though, overall, they remained the most employed strategy. *The product-based assessment* was also notably increased in humanities, which almost completely forwent *problem-solving strategies*. Music and arts saw a significant reduction in *collective examinations*, presumably because of the difficulty in organizing group works and sessions; teachers relied more on *product-based assessment*, which became their most employed assessment strategy. Mathematics showed a series of reorganization trends: on the one side, reduction of the previously most employed *problem-solving strategies* and on the other side, a further increase in the use of *closed questions*, which became the most prevalent strategy of assessment. *Individual examinations* saw a significant reduction, whereas previously seldom used *product-based assessment* was increased. In science and technology, a reduction in the most popular practice, *individual examination*, was observed in favor of *product-based assessment.*

Considering the association of assessment strategies, we did not observe radical changes during the pandemic compared to the prepandemic scenario (Table 7). Rather, previous trends were confirmed, that is, the strong association between semi-structured tests and products, indicating that teachers either do not use either of them or tend to employ both. Pandemic-specific video calls and online tests were positively associated, indicating that teachers used both at the same time. Interestingly, there are indications that a large part of online tests comprised the use of quizzes. Furthermore, video calls and individual examinations were often used in combination.

Summing up, we can preliminarily confirm that the pandemic-related disruptions, the use of tools in teaching and learning practices, and the corresponding relaxation of certain established frames of operation have created grounds for reorganization of assessment practices and have shown positive changes toward the use of formative assessment methods. This finding might indicate that when entertaining different options and enjoying some level of autonomy, teachers can resort to alternative forms of assessment. As a final reflection, we can say that based on this data, the product-based assessment seems to be suitable for teaching modes that are increasingly moving toward a model that integrates blended approaches. We can also say that assessment methods also change according to discipline, and therefore, special attention needs to be given to discipline-specific assessment methods. However, one trend is very clear: product-based assessment has gained its momentum during the pandemic. In future, it would be interesting to investigate the underlying factors and motivation for such preference.

References

Albó, L., Beardsley, M., Martínez-Moreno, J., Santos, P., & Hernández-Leo, D. (2020). Emergency remote teaching: Capturing teacher experiences in spain with selfie. *Lecture Notes in Computer Science (Including Subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, *12315 LNCS*, 318–331. https://doi.org/10.1007/978-3-030-57717-9_23

Author, 2022 (Blinded for review)

Beardsley, M., Albó, L., Aragón, P., & Hernández-Leo, D. (2021). Emergency education effects on teacher abilities and motivation to use digital technologies. *British Journal of Educational Technology*, *52*(4), 1455–1477. https://doi.org/10.1111/bjet.13101

Bennett, R. E. (2015). The changing nature of educational assessment. *Review of Research in Education*, *39*(1), 370–407.

Bonaiuti, G., & Dipace, A. (2021). *Insegnare e apprendere in aula e in rete. Per una didattica blended efficace*.

Bozkurt, A., Jung, I., Xiao, J., Vladimirschi, V., Schuwer, R., Egorov, G., Lambert, S. R., Al-freih, M., Pete, J., Olcott, D., & Rodes, V., Aranciaga, I., Bali, M., Alvarez, A. V, Roberts, J., Pazurek, A., Raffaghelli, J. E., Panagiotou, N., Coët-logon, P. De, Shahadu, S., Brown, M., Asino, T. I., Tumwesige, J., Reyes, R., Ipenza, E. B., … Paskevicius, M. (2020). A global outlook to the interruption of education due to COVID-19 Pandemic: Navigating in a time of uncertainty and crisis. *Asian Journal of Distance Education*, *15*(1), 1–126. https://doi.org/10.5281/zenodo.3878572

Author, 2021 (Blinded for review)

Fullan, M., Quinn, J., Drummy, M., & Gardner, M. (2020). Education reimagined: The future of learning. *A Collaborative Position Paper between New Pedagogies of Deep Learning and Microsoft Education*.

Farmer, R. L., McGill, R. J., Dombrowski, S. C., McClain, M. B., Harris, B., Lockwood, A. B., ... & Stinnett, T. A. (2020). Teleassessment with children and adolescents during the coronavirus (COVID-19) pandemic and beyond: Practice and policy implications. *Professional Psychology: Research and Practice*, *51*(5), 477.

Gamage, K. A. A., Silva, E. K. de, & Gunawardhana, N. (2020). Online Delivery and Assessment during COVID-19: Safeguarding Academic Integrity. *Education Sciences 2020, Vol. 10, Page 301*, *10*(11), 301. https://doi.org/10.3390/EDUCSCI10110301

Giovannella, C., Passarelli, M., Alkhafaji, A. S. A., & Negrón, A. P. P. (2021). A comparative study on the effects of the COVID-19 pandemic on three different national university learning ecosystems as bases to derive a Model for the Attitude to get Engaged in Technological Innovation (MAETI). *Interaction Design and Architecture(s) Journal - IxD&A*, *47*, 167–190.

Grion, V., Serbati, A., Sambell, K., & Brown, S. (2020). Valutazione e feedback in Dad in tempo di emergenza: strategie d'azione nei contesti universitari. In P. Limone, A. G. Toto, & N. Sansone (Eds.), *Didattica universitaria a distanza tra emergenza e futuro* (pp. 75-90). Bari, IT: Progedit.

Guasti, L. (2013). *Competenze e valutazione metodologica: indicazioni e applicazioni pratiche per il curricolo*. Edizioni Centro Studi Erickson.

Harlen, W. (2007). *Assessment of learning*. Sage.

Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020). The difference between emergency remote teaching and online learning. *Educause Review*, *27*.

Johnson, T., Eradze, M., & Kobakhidze, M. N. (2022). Finding a Silver Lining in the COVID-19 Pandemic: A Case of a Teachers' Online Community in Georgia. In *Handbook of Research on Global Education and the Impact of Institutional Policies on Educational Technologies* (pp. 267–288). IGI Global. https://doi.org/http://doi:10.4018/978-1-7998-8193-3.ch01

Luik, P., & Lepp, M. (2020). Activity of Estonian Facebook Group During Transition to e-Learning due to COVID-19. *European Conference on E-Learning*, 308–XVII.

Martin, J. (2002). Aux origins de la "science des examens» (1820-1940). *Histoire de l'education*, *94*, 177-199.

Rapanta, C., Botturi, L., Goodyear, P., Guàrdia, L., & Koole, M. (2021). Balancing Technology, Pedagogy and the New Normal: Post-pandemic Challenges for Higher Education. *Postdigital Science and Education*, *3*(3), 715–742. https://doi.org/10.1007/s42438-021-00249-1

Secchi, D., & Cowley, S. J. (2018). Modeling organizational cognition: The case of impact factor. *Journal of Artificial Societies and Social Simulation*, *21*(1).

Secchi, D., & Cowley, S. J. (2021). Cognition in Organisations: What it Is and how it Works. *European Management Review*, *18*(2), 79–92. https://doi.org/10.1111/EMRE.12442

Author, 2021 (Blinded for review)

Wiliam, D. (2011). What is assessment for learning? *Studies in Educational Evaluation*, *37*(1), 3–14.

Appendices

Table 5. Groups composition

Discipline	Group	Group total	%	Primary	Lower secondary	Upper secondary	Total
Italian	1	979	27.3	526	249	204	979
English	2	432	12.0	74	93	152	319
Second foreign language				3	56	54	113
Geography	3	150	4.1	12	10	8	30
History				34	3	13	50
Religion				34	19	17	40
Music	4	107	3.0	5	37	2	44
Visual arts				18	34	11	63
Mathematics	5	677	18.9	415	132	130	677
Science	6	174	4.8	12	5	87	104
Technology				11	34	25	70
Phys. Ed.	7	87	2.4	15	28	44	87
Others	8	984	27.4	424	123	437	984
Total	-	3590	100	1583	823	1184	3590

Table 3. Mean use of assessment strategies by discipline before and during COVID

Group	Mean of assessment before COVID	Mean of assessment during COVID	*t*-test	*p*-value
1	2.99 (0.76)	2.81 (0.76)	-10.03	<0.001
2	3.00 (0.73)	2.86 (0.78)	–5.07	<0.001
3	2.83 (0.77)	2.55 (0.75)	–5.48	<0.001
4	2.84 (0.82)	2.65 (0.82)	-2.92	0.04
5	2.88 (0.73)	2.67 (0.77)	-10.01	<0.001
6	3.03 (0.67)	2.87 (0.70)	–4.20	<0.001
7	2.71 (0.71)	2.65 (0.73)	-1.12	0.22
8	2.91 (0.76)	2.71 (0.79)	-11.12	<0.001
Overall	2.93 (0.75)	2.74 (0.78)	-19.92	<0.001
K-W H test	31.138	41.514		
***p*-value**	<0.001	<0.001		

Table 4. Relative use of assessment methods by the group before COVID

	Assessment strategy						
	Problem-solving	Closed questions	Open questions	Semi-structured	Product	Individual examination	Collective examination
1	-0.48 (1.02)	+0.12 (0.92)	+0.24 (0.78)	-0.13 (0.94)	-0.14 (0.99)	+0.49 (0.88)	-0.09 (1.06)
2	-0.70 (1.02)	+0.18 (0.98)	+0.39 (0.76)	-0.29 (0.99)	-0.24 (0.99)	+0.70 (0.88)	-0.04 (1.10)
3	-0.48 (0.99)	+0.39 (0.94)	+0.26 (0.78)	-0.50 (0.94)	-0.19 (1.12)	+0.32 (1.01)	+0.20 (1.05)
4	-0.34 (0.95)	+0.22 (0.95)	-0.05 (0.86)	-0.30 (0.88)	+0.20 (1.32)	+0.31 (0.98)	-0.02 (1.13)
5	+0.54 (0.78)	+0.28 (0.89)	+0.08 (0.84)	-0.64 (0.89)	-0.49 (0.10)	+0.43 (0.93)	-0.21 (1.10)
6	+0.09 (0.95)	+0.30 (1.00)	+0.05 (0.84)	-0.44 (0.94)	-0.03 (1.11)	+0.55 (1.00)	-0.53 (1.11)
7	-0.14 (1.11)	+0.47 (0.88)	+0.06 (0.88)	-0.61 (1.10)	-0.15 (1.00)	+0.36 (0.93)	+0.02 (1.21)
8	-0.07 (0.99)	+0.27 (0.99)	+0.11 (0.82)	-0.39 (0.96)	-0.29 (1.06)	+0.47 (1.00)	-0.23 (1.08)
H test	602.52	32.58	73.51	140.27	87.17	36.62	51.64
Sig.	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Overall	-0.12 (1.05)	+0.23 (0.95)	+0.17 (0.82)	-0.36 (0.96)	-0.25 (1.04)	+0.48 (0.94)	-0.15 (1.09)

Table 1. Correlation of assessment practices before COVID

	Problem-solving	Closed questions	Open questions	Semi-structured	Products	Ind. exam	Group exam
Problem-solving	--						
Closed questions	0.263**	--					
Open questions	0.271**	**0.453****	--				
Semi-structured	0.185**	0.181**	**0.407****	--			
Products	0.181**	0.120**	0.274**	**0.510****	--		
Ind. exam	0.188**	0.213**	**0.426****	0.298**	0.261**	--	
Group exam	0.167**	0.206**	0.243**	0.188**	0.175**	**0.372****	--

Table 7. Relative use of assessment strategies during COVID (RF) and differences compared to before (D)

	Assessment strategy													
	Problem-solving		Closed questions		Open questions		Semi-structured		Product		Individual exam.		Collective exam.	
	RF	D	RF	D	RF	D	RF	D	RF	D	RF	D	RF	D
1	-0.53 (0.99)	-0.05*	+0.27 (1.00)	+0.16**	+0.18 (0.84)	-0.06*	-0.12 (0.94)	+0.01	-0.00 (0.98)	+0.13**	+0.34 (1.04)	-0.15**	-0.13 (1.14)	-0.04
2	-0.76 (0.93)	-0.06	+0.34 (1.05)	+0.15**	+0.31 (0.83)	-0.07	-0.27 (0.97)	+0.02	-0.12 (1.02)	+0.12*	+0.53 (1.04)	-0.16**	-0.05 (1.18)	-0.01
3	-0.68 (0.93)	-0.20*	+0.51 (1.12)	+0.12	+0.17 (0.88)	-0.09	-0.41 (1.00)	-0.10	+0.02 (1.23)	+0.22*	+0.27 (1.08)	-0.05	+0.10 (1.07)	-0.10
4	-0.40 (0.94)	-0.05	+0.27 (1.00)	+0.04	-0.06 (0.88)	-0.01	-0.21 (1.02)	+0.10	+0.37 (1.13)	+0.19*	+0.29 (1.13)	-0.03	-0.27 (1.14)	-0.24*
5	+0.33 (0.90)	-0.21**	+0.48 (0.99)	+0.19**	+0.03 (0.86)	-0.05	-0.53 (0.90)	+0.11*	-0.27 (1.00)	+0.22**	+0.19 (1.10)	-0.24**	-0.23 (1.20)	-0.02
6	-0.00 (1.07)	-0.10	+0.42 (1.03)	+0.11	-0.06 (0.91)	-0.11	-0.32 (0.96)	+0.12	+0.13(1.08)	+0.16*	+0.38 (1.18)	-0.17*	-0.54 (1.25)	-0.01
7	-0.38 (0.98)	-0.23*	+0.50 (1.11)	+0.03	+0.12 (0.88)	+0.06	-0.41 (0.98)	+0.20*	-0.06 (0.94)	-0.09	+0.35 (0.98)	-0.00	-0.12 (1.32)	-0.14
8	-0.08 (1.02)	-0.05*	+0.43 (1.07)	+0.15**	+0.02 (0.88)	-0.09*	-0.39 (0.96)	+0.01	-0.11 (1.05)	+0.14**	+0.37 (1.12)	-0.15**	-0.30 (1.16)	-0.04
H	461.90		24.23		62.034		90.32		66.02		33.59		49.24	
Sig	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
Ov.	-0.22 (1.04)	-0.12**	+0.38 (1.04)	+0.15**	+0.10 (0.87)	-0.07**	-0.30 (0.96)	+0.06**	-0.08 (1.03)	+0.16**	+0.34 (0.88)	-0.14**	-0.20 (1.18)	-0.06**

Table 2. Correlation of assessment practices during COVID

	Problem-solving	Closed questions	Open questions	Semi-structured	Products	Individual exam.	Group exam.	Online test	Video call	Other
Problem-solving	--									
Closed questions	0.253**	--								
Open questions	0.300**	**0.488****	--							
Semi-structured	0.235**	0.185**	**0.409****	--						
Products	0.247**	0.143**	0.311**	**0.567****	--					
Individual examination	0.134**	0.150**	0.325**	0.249**	0.228**	--				
Group examination	0.115**	0.133**	0.201**	0.160**	0.154**	0.349**	--			
Online test	0.264**	**0.358****	0.304**	0.206**	0.220**	0.219**	0.277**	--		
Video call	0.193**	0.223**	0.201**	0.158**	0.168**	0.271**	0.234**	**0.410****	--	
Other	0.013	-0.039*	-0.021	-0.004	-0.026	-0.040*	0.012	-0.025	-0.040*	--