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Innovation in Teaching Methods and Techniques. Experiments and Uncertainties of Academics Before and After the Pandemic in the Italian Universities

Barbara Mazza, Elena Valentini

Abstract: This paper reviews studies that examine definitions of innovative teaching, innovation in teaching via digital platforms, and distance learning, to identify differences between them. In terms of innovation in university teaching, our starting hypothesis was that the pandemic has led to a greater use of digital platforms, through an upsurge in distance learning. But this has not necessarily brought about innovation in methods geared towards a student-centered approach. The study here is the second phase of a project on innovative teaching, begun before the onset of the Covid-19 pandemic, assessing progress in Italian mega-universities running teacher-training projects for more than five years. The results of this second phase are presented, considering whether the pandemic emergency has accelerated, altered, or hindered innovation, a process foreseen by the European training space. The third phase of the study will take place post-pandemic when teaching innovation is no longer influenced by the health crisis. The research will be extended to actors other than teachers involved in the process, particularly students.

Keywords: distance learning, Covid-19 DAD, platform education, behavioral modes in teaching innovation

Introduction

Teaching innovation in Italian universities has been underway for some time now, following the Bologna Process. In fact, innovative didactics represents one of the unavoidable responses to the economic, social, and cultural changes that have affected European educational policies over the last two decades (Ciarini & Giancola, 2016). There has been: redefinition of identity and training purposes of universities and their teachers (Montesperelli, 2016), affecting practices and the academic profession as a whole (Brennan et. al., 2017; Cummings & Teichler, 2015; Marini et. al., 2019; Felisatti & Serbati, 2015; 2017); a consequent expansion of the functions of and skills required by teachers in training design and management (Galliani, 2001; Castoldi, 2012; 2018; Braga, 2017; Benadusi & Molina, 2018); changes in teacher-student relations (Moscato, 2020); and, new forms of knowledge and transmission of knowledge, and the new ways of learning, training, and collaboration (Falcinelli et. al., 2009; Valentini, 2008), which have led to a variety teaching styles being adopted (Falcinelli et. al., 2016).

These processes have stimulated a theoretical and empirical scientific debate on the innovation of university teaching, spanning several decades, with change requiring time to take effect. However, since 2016-17 innovation has been accelerated thanks to various Italian universities launching specific projects. The analysis of a selection of these projects (Mazza & Valentini, 2021b) shows that their development has responded to the processes of reform, particularly those initiated by the OECD (Henard & Roseveare, 2012), and the European Union (European Commission, 2011; 2013; High-Level Group on the Modernization of Higher Education, 2013).

The study presented in this paper is a continuation of the research first started in 2019-2020. In the previous phase, one of the objectives was to verify how far teachers adopted innovative teaching methods after specific training. As a diachronic research project, monitoring of the progress of the innovative teaching methodologies was foreseen.

Following this first phase (the results of which were published and discussed in 2020), the outbreak of the Covid-19 pandemic made the question of teaching innovation more urgent, particularly with the increased use of distance learning, adopted by Italian universities during the lockdown period, with a blended learning mode being introduced in the subsequent phase of the pandemic crisis. In this second period, the second phase of the research was begun, to verify whether the changed circumstances had accelerated teaching innovation. The third phase of the study is only foreseen when university education is back to fully being 'normal' again, so enabling the assessment of university teaching innovation no longer determined by the state of emergency.

The theoretical framework

Innovative Didactics: definitions, strategies and methods

The theoretical framework is centred on the relationship between Innovative Didactics (ID) and distance learning based on the use of technologies, two aspects which can intertwine, but not necessarily coincide. That is to say, the use of online platforms is not a sure indicator of teaching innovation. The hypotheses of the present study and one of the research tools used, a questionnaire through a web survey (see below), are based on this framework.

The literature gives various definitions of terms ‘innovation’ and ‘Innovative Didactics’¹, including those given in the studies conducted by the Joint Research Center Institute for Prospective Technological Studies of the European Commission (Kampylis, Bocconi & Punie, 2012). Didactic innovation is often understood as discarding the traditional teaching practice based on a teacher-based frontal and transmissive approach, and adopting a more student-centered approach, by stimulating active student participation (San-cassani et al. 2019). ‘Innovative Didactics’ cannot, however, be formalized in absolute and general terms. It varies in relation to the characteristics of the specific teaching, the learning objectives, the actors involved, and the tools used (Falcinelli et al., 2019). In defining innovative teaching, different elements have been considered: context, educational methods, and the integrated use of different languages in learning processes (Panciroli, 2018).

There are many theoretical frameworks concerning innovative teaching. Fedeli (2017) identifies some of them: learner-centered teaching (Weimer, 2013), participatory education (Campbell & Burnay, 2005), student voice (Cook-Sather & Luz, 2015; Seale, 2010), personalized learning (Campbell et al., 2007; Keefe & Jenkins, 2000; Peters, 2009; Shaikh & Khoja, 2012; Waldeck, 2007), work-related learning (Dirkx, 2011; Gardner & Barktus, 2014), and transformative learning (Mezirow, 2001, Taylor, 2007, 2015).

Fedeli & Frison (2018) propose a classification of participatory and interactive strategies and methods to facilitate learner-centered learning, depending on context, available tools, educational objectives, and different types of learning to be promoted. Among these, are: methods of discussion, e.g. circle of voices, chalk talk, questioning, snowballing, and conversational roles (Brookfield, 2013); methods and techniques that facilitate animation, collaboration, and cooperative learning processes based on group work, such as brainstorming, meta plan, analog games, online group work, and case analysis (Brookfield, 2013; Di Nubila, 2008; Quaglino et., 1992; Rotondi, 2000); ex-

¹ We have reviewed the Italian and non-Italian literature on didactic innovation models, focusing our attention on those centered on three specific elements - participation, engagement, and the emotional impact (Mazza & Valentini, 2021a).

periential and reflective methods and strategies (Fenwick, 2003; Kolb & Kolb, 2005); interactive methods (Coryell, 2016; Felder & Brent, 2016) characterized by the active involvement of learners, such as one minute paper, think, pair and share, formative quiz, computer-based interaction systems and concept maps (Coryell, 2016); and, simulations and laboratories (Fabbri & Romano, 2017), e.g. a business game, case analysis, problem-based learning, role play, performance-based learning. Fedeli and Frison also identify the category of methods involving ICT to promote active teaching through digital technologies and the network.

Two other innovative approaches are ‘active learning’ (Meyers & Jones, 1993; Prince, 2004), and ‘peer instruction’ – “an interactive teaching technique that promotes classroom interaction to engage students and address difficult aspects of the material” (Watkins & Mazur, 2013, p. 37).

The classification by Fedeli and Frison helps to map the strategies and methods to be combined, according to context, learning objectives, and related needs. For example, digital technologies can facilitate student learning and action, both in more learner-centred approaches, but also in more transmissive teaching.

The different approaches and theories mentioned above can be traced back to university teaching transforming from a less teacher and content-centered approach to more a student and learning-centered approach. Gonzales (2009) effectively summarizes the evolution of these approaches from the point of view of both learning i.e. the student, and teaching i.e. teacher. The author reviews the main studies establishing this distinction, starting with Kember (1997) that:

“established two broad orientations to teaching: ‘teacher-centered/content-oriented’, which included two conceptions of teaching (‘teaching as imparting information’ and ‘teaching as transmitting structured knowledge’); and ‘student-centered/learning-oriented’, which also includes two conceptions of teaching (‘teaching as facilitating understanding’; and ‘teaching as promoting intellectual development/conceptual change’). An intermediate/transitional conception was situated between the two broad orientations: ‘teaching as student-teacher interaction’ ” (Gonzales, 2009, p. 300).

Gonzales also considers both the studies investigating the relationships between the concepts of learning and teaching and teaching approaches (Kember & Kwan, 2000), and the research on the different ways of using the web in learning and in teaching. He also considers the role of context, such as, institutional setting and support, student type, and curriculum and subject.

Distance education before and during the pandemic emergency

The other theme central to our investigation concerns distance learning, used by universities and schools alike, to ensure didactic continuity during

the pandemic emergency. Precisely for this reason it has been more properly defined by many as Emergency Didactics. Colombo, Poliandri & Rinaldi, (2020, pp. 1-2) consider that, in this situation characterized by the weakening of the “space-time frameworks that structure educational action as a collective action”, teaching was characterized by,

entirely experimental forms, functions, and roles, triggering processes of adaptation, but also maladjustment (disorientation) in the actors, with consequences - positive and negative - in the short and long term on individuals, on the social representations of the emergency, and on the structures of relationship that have the task of protecting and accompanying them in the elaboration of the health crisis and future prospects.

During lockdown, the use of technologies in the required distance learning was mainly instrumental. Hence, it has generally been assumed that there was no redesigning of contents (Bruschi, 2020), with the network merely being used to distribute and transmit didactic input (Tamborra, 2021). However, in some cases, especially where didactic innovation practices or training had already begun or been consolidated, the lockdown experience facilitated change towards greater innovation, as we will see in the second part of the paper.

Just as innovative teaching and distance teaching do not necessarily coincide, distance teaching and digital teaching also do not necessarily coincide. As Salmieri & Visentin (2020, p. 5) point out:

While the latter (digital teaching – our brackets), in its innumerable applications and methodologies in coexistence, is a bouquet of options to reinforce shared learning experiences and increase the quantity and quality of on-site interactions, distance learning is a surrogate, with all problems of attention, interaction, communication that derive from it.

For years, distance education has been an umbrella term like that of distance learning. The well-known classification of the historical evolution of distance education in terms of generations was originally introduced by Nipper (1989) and Garrison (1985) and was taken up in Italy by Trentin (1998) (Calvani & Rotta, 2000). Development of the web enabled the third-generation distance learning to use social interaction (absent in previous generations), which led to the term e-learning. About 20 years ago, Masie Center scholars² took the “e” to not only refer to ‘electronic’, but also ‘experience’, ‘exchange’ (i.e. exchange of information), ‘exploration’ (referring to learning by discovery), and (self)- ‘expression’. Scurati (2002) also added 3 other meanings: ‘extended’ -extended over time, in continuous training; ‘expanded’ – near unlimited boundaries offered by the network; and, ‘enriched’ - enrich-

² Elliot Masie claimed authorship of the e-learning acronym in 1999.

ing opportunities and insights offered by the Internet. Other scholars in the sociology of communication area underline the importance of the social dimension in e-learning (Capogna, 2014; Colombo, 2008; Valentini, 2008; Diana & Catone, 2018), with Colombo claiming the model incorporates “the social function of learning within a model that sees knowledge as the premise of a type of human development driven by economic development” (Colombo, 2008, p. 3). More recently, Tamborra (2021, p. 158) refers to the conception of e-learning proposed by Horton (2012) as a “complex system of didactic planning, preparation of technological environments and methodological change necessary to favour qualitatively valid and meaningful learning”.

Hence, the distinctive feature of e-learning and the so-called third generation is the use of digital technologies, both as a starting point for rethinking teaching methodologies (Capogna, 2008), and for overcoming “social distance” (Trentin, 2001). Though the pandemic has led to social distancing for health reasons, with the consequent use of online teaching, this does not necessarily mean the potential for social interaction has been fully exploited, if at all, or that new methodologies in innovative teaching have been promoted or used. Other terms used to define learning over the web are online training, online learning, online education³, web-based training or web-based learning, Internet-based training (Ibt), and technology enhanced learning. The last term indicates all possible ways of using ICT to improve/optimize the learning process by offering students flexibility in terms of space, time, and study rhythms, favouring different learning styles (Trentin, 2007). These different terminologies indicate how, in last twenty years, e-learning is seen as an opportunity to rethink teaching methodologies, moving from a teacher/content-centered approach to a student/ learning-centered approach. The net is used both to support collaborative and interactive forms, and to reproduce traditional teaching practices.

Several scholars have focused on the use of digital technologies to develop cooperative and collaborative learning processes (Calvani, 2005; Ranieri, 2004). Some have studied innovative teaching methods in blended /hybrid learning modalities, based on the integration of physical and online teaching spaces (Catone & Diana, 2019; Trentin 2016; 2017; Rossi 2019; Corsi et al. 2019; Rivoltella 2012) or for other innovative educational activities, such as the use of Student Response System (Ranieri et al., 2018), social networks (Ranieri & Manca, 2013), and serious games (Cheong et al., 2013). Others have highlighted how computer-supported collaborative learning has led to higher quality teaching in terms of interaction, motivation, and understanding (Yang, N. et al., 2018).

³ Linda Harasim is one of the earlier scholars who spoke of online education (1989). She is considered one of the pioneers of online education. For an updated review on the evolution of e-teaching and pedagogical models, see Harasim, 2017.

To conclude this terminological overview, the frequently used term ‘blended learning’ should be clarified. As anticipated, while teaching was necessarily online during the lockdown, in the academic year 2020/2021, most universities have now adopted a so-called mixed mode, involving both face-to-face activities and online teaching. However, though there may be exceptions, such use of distance learning, essentially based on expediency (Bruschi & Perissinotto 2020; Rossi 2019), tends to be far from the original principles of ‘blended learning’, which place “particular emphasis on the methodological aspects that allow for effective coordination of face-to-face and online activities, in a continuity aimed at guaranteeing participatory processes of teaching and learning (Bonk & Graham, 2005)” (Tamborra, 2021, p. 159).

Already twenty years ago, several authors, updating the generation classification, spoke of a fourth phase characterized by an educational model based on the strategic integration of classroom training and online training, based on a web logic, and on enhancing collaborative learning through learning and practice communities and group work (Trentin, 2001). Neither the mixed-mode, nor the purely online mode (especially during the lockdown), necessarily favour the use of learning-centred approaches. Different outcomes have been observed: from the transfer of typical online approaches (even purely dispensing), for example, of videoconferencing systems or online uploading of pre-recorded lessons to forms of rethinking of teaching activities. Instead, a truly blended mode aims at an integrated learning environment, combining face-to-face and online methods, to enhance the *potential* of digital, and not as a matter of convenience.

We also analysed investigations on the teaching strategies used in the pandemic emergency in specific contexts, the studies aiming to understand the changes in teaching, particularly in terms of didactic innovation, or in the actual redefining of the teaching profession itself (e.g. Consiglio et al., 2020; Gambardella et al., 2020; Ramella & Rostan, 2020; Piromalli & Viteritti, 2019).

Ramella and Rostan argue that far from encouraging educational innovation, in the absence of adequate teacher training, platforms are at best unproductive, and can actually impoverish teaching. Likewise, as Salmieri and Visentin (2020) also point out, the lack of teacher training has led to the extreme heterogeneity of digital skills among teachers, which has often also created a cognitive loss for students. At the same time, however, the research presented in Ramella & Rostan (2020) shows that digital technologies can consolidate didactic innovation already in progress by further supporting interactive and collaborative teaching. The same survey also shows a polarization between those who do not intend to retain aspects of emergency distance learning, and those who are open to innovation. This aspect is further investigated in the present paper.

Finally, though not discussed in detail for reasons of space, other studies enabled us to define the hypotheses of the research, particularly those studies examining implications of the *platformization* and *datification* of higher education (Argentin et al., 2019; Giancola & Piromalli, 2020; Gambardella et al. 2021; Jarke & Breiter, 2019; Maccarini, 2019; Portanova, 2021; Piromalli & Viteritti 2019; Serpieri, 2020). On the one hand, some studies on learning analytics and platforms offer interesting insights into the actual and potential use of data and platforms in didactic planning and management of training processes (Tamborra, 2021). On the other, there are strong concerns about technologies, devices, and platforms not being neutral tools but “socio-material objects that inscribe, values, moral order, and cultural policies” (Argentin et al., 2019, p. 11). In line with Gambardella et al. (2020), the use of platforms needs to be investigated to assess how far they can contribute to the renewal of teaching practices, and whether they are adequately integrated into blended learning models or whether we risk a “return to tailoring of university teaching” (Ibidem, p. 311), potentially making further demands on university teachers whose duties become ever more onerous and complex.

Considering the literature, the study is based on the following research hypotheses:

Ip1: given that studies confirm the usefulness of digital platforms in teaching planning and in course management, they are considered fundamental in management of innovative teaching methods.

Ip2: despite the health emergency drawing attention to teaching issues, distance education has not contributed to accelerating change in favour of greater adoption of innovative practices, since it does not fully respond to the principles of teaching innovation.

Ip3: given the level of awareness of the interviewees towards the ID modalities, there is greater attention, in the planning phase of the teaching, to make the course objectives consistent with the teaching practices used.

Methodology

This study aims to examine through a web survey how far distance learning has led to innovation in teaching methods, and also to assess whether the health emergency has stopped, accelerated, or modified how the very concept of innovation in teaching is understood, along with the methods used, with greater focus on a student-centred approach in university teaching.

Since the first phase of the study, the research has focused on teachers who have participated in teaching innovation projects in Italian mega-universities, that are training courses aimed at raising awareness and preparing the academics for the use of methods and tools related to innovative didactics. This enabled us to focus our attention on a sample of teachers who are more

sensitive to innovative teaching methods and more likely to use them. Out of 10 Italian Mega-Universities in total, the research presented in this paper focuses on the 6 universities willing to join the study: Milan “La Statale”, Turin, Bologna, Pisa, Rome Sapienza, and Naples Federico II. All these universities have set up innovative teaching projects, and this was a prerequisite for identifying the cases to be examined. This choice also took into consideration the results of a study by Regini & Trigilia (2018), aimed at examining the index of impact of ID and ID equipment available in public universities. In the universities where there were several projects, we selected one or those we considered the most useful, given the objectives of the survey. In each university, a semi-structured questionnaire was administered between March and May 2021, aimed at teachers involved in innovative teaching projects, so the innovative teaching activities adopted before and during the pandemic emergency could be identified, as well as any plans to incorporate change in future teacher training programmes. A total of 293 teachers took part in this second phase of the research.

Notably, the most active teachers in teaching innovation are also those most contributing to change and the adoption of a student-centered approach. Hence, they are helping to reach the goal set by the European Union (European Commission, 2020), that by 2025, inclusive and connected higher education systems are created, promoting excellence in skills development, and contributing to the innovation of teaching methods, to ensure the effectiveness and efficiency of learning outcomes.

Table 1 shows the number of teachers from each university involved in the two phases of the research, the first carried out before the pandemic emergency, and the second, during the emergency. As often happens in diachronic monitoring, the number of respondents decreased slightly in the second phase (- 16%).

Table 1 - University professors involved (2021)

Mega University	N. respondents (2019-20)	N. respondents (2020/2021)
University of Milan “La Statale”	NR	29
University of Turin	32	10
University of Bologna	148	56
University of Pisa	18	18
University of Rome Sapienza	99	90
University of Naples Federico II	17	90
TOT.	314	293

Source: data n.s. processing (2021)

As already indicated in the explanation of the previous survey, the different number of teachers in the sample for each university depends on the number of teachers who are participating or have participated in the teaching innovation projects identified: the questionnaire was only sent to those teachers. In universities with several projects, we selected, in agreement with the manager we contacted, one or those deemed most useful, given the survey objectives. The selected projects were different in terms of: set up year (e.g. Padua in 2016, Rome Sapienza in 2017, Naples in 2019); the edition selected to send the invitation to fill in the questionnaire; and whether registration was compulsory or voluntary (from compulsory projects for new RTDB⁴ with higher numbers of participants to those with voluntary participation).

Table 2 - The profile of respondents (2021)

Age group (years old)	Full Prof.		Associate Prof.		Lecturer		RTDB		RTDA		TOT.	
	M	F	M	F	M	F	M	F	M	F	M	F
30-40	0%	0%	0%	3%	0%	0%	32%	32%	75%	50%	17%	16%
41-50	9%	0%	56%	39%	60%	65%	61%	61%	13%	50%	45%	47%
51-60	30%	27%	31%	31%	40%	29%	6%	7%	12%	0%	20%	19%
61-70	61%	73%	13%	27%	0%	6%	0%	0%	0%	0%	19%	17%
TOT. 293 Respondents												
Legend: M=Male, F= FEMALE												
Median: 41-50 years old												

Source: data n.s. processing (2021)

Compared to the first survey, the interviewees involved in this second phase were mainly aged between 41 and 50 (older).

Moreover, statistics show that the representativeness of the disciplinary macro-sectors has remained constant (Table 3).

⁴ RTDA are type A fixed-term researchers, under art. 24, paragraph 3, letter a) of Law 31/12/2010, no. 240. They are recruited with three-year contract that can be extended only once for two years, subject to a positive assessment of the research fellow's teaching and research activities.

^RTDB are type B fixed-term researchers, under art. 24, paragraph 3, letter b) of Law 31/12/2010, no. 240. They are recruited with non-renewable three-year contracts, full-time only, with the possibility of becoming an associate professor after obtaining the so-called Italian National Scientific Qualification.

Table 3 - The most represented disciplinary macro-sectors (2021)

	Milan "La Statale"	Turin	Bologna	Pisa	Rome Sapienza	Naples Federi- co II	TOT.
3-Chemistry	13,8%	15,6%	1,8%	5,6%	4,0%	5,6%	7,7%
5-Biology	13,8%	18,8%	21,4%	22,2%	17,2%	17,8%	18,5%
6-Medicine	6,9%	3,1%	5,4%	22,2%	16,2%	7,8%	10,3%
7-Agricultural and veterinary sciences	10,3%	21,9%	8,9%	16,7%	0,0%	18,9%	12,8%
Healthcare	44,8%	59,4%	37,5%	66,7%	37,4%	50,1%	49,3%
1-Mathematics and Informatics	10,3%	9,4%	5,4%	5,6%	0,0%	5,6%	6,5%
2-Physics	13,8%	6,3%	3,6%	5,6%	5,1%	6,7%	7,3%
4-Earth Sciences	6,9%	0,0%	1,8%	5,6%	3,0%	2,2%	3,6%
8-Civil Engineering and Architecture	0,0%	0,0%	8,9%	11,1%	6,1%	5,0%	5,5%
9-Industrial and Information Engineering	0,0%	0,0%	0,0%	0,0%	6,1%	5,0%	2,3%
Hard Sciences	31,0%	15,6%	19,7%	27,9%	32,3%	24,5%	25,2%
10-Antiquities, Philology, Literary Studies, Art History	0,0%	15,6%	12,5%	0,0%	6,1%	3,3%	6,2%
11-History, Philosophy, Pedagogy, and Psychology	13,8%	6,3%	8,9%	4,6%	6,1%	6,7%	7,7%
Humanities	13,8%	21,9%	21,4%	4,6%	12,1%	10,0%	13,9%
12-Law Studies	3,4%	0,0%	1,8%	0,0%	3,0%	8,9%	2,8%
13-Economics and Statistics	0,0%	0,0%	12,5%	0,5%	8,1%	2,2%	3,9%
14-Political and Social Sciences	6,9%	3,1%	7,1%	0,5%	7,1%	4,4%	4,9%
Political and Social Sciences	10,3%	3,1%	21,4%	1,0%	18,2%	15,5%	11,6%

Source: data n.s. processing (2021)

Already in the previous study, it emerged that the scientific macro-areas (Healthcare, with a slight 5% increase, and the Hard Sciences, remained stable) are more involved in teaching innovation projects than those of the humanities and social sciences, with Humanities having a slight decrease (of 3%), Political and Social Sciences, for example, decreasing slightly by 2.6%, compared to the previous survey.

The outline of the web survey was organized around the main research questions: first, we asked some questions regarding innovative teaching and evaluation methods used before the pandemic; then, questions concerning what changed during the lockdown; next, questions regarding mixed modes used post-lockdown; and finally, questions aimed at understanding future didactic intentions. The goal is to understand how far the pandemic affected: the redefinition of teaching practices; course objectives (to verify the consistency between declared objectives and the training carried out); and the ways and the extent technologies were employed.

We carried out a descriptive data analysis, based on mono and bivariate analysis. Moreover, we conducted an interpretative analysis based on regressive multivariate techniques to classify the teachers according to four prevalent behavioural modes in their use of innovation teaching methods during the two phases of the research.

In this way, 4 categories of teachers were identified: teachers 'advocating' ID were identified, i.e. those who habitually used innovative practices even before the pandemic, and will continue to use them in the future; 'pandemic' teachers, i.e. those who began incorporating innovative teaching during the pandemic, and but are willing to continue in the future; 'possibilist' teachers, i.e. those who during the pandemic period have begun to evaluate and/or experiment with some practices with the intention of adopting them in the future; 'sceptic' teachers, i.e. those minimally using innovative methods during lockdown, considering them ineffective, with no intention of using them in the future.

We also estimated the utility rates of the ID (UR), the adoption of evaluation methods (AR), the coherence between objectives and course implementation (CR), and the use of technologies (ITR). The first two (UR and AR) were calculated based on the number of positive responses provided by the interviewees according to their objectives, and the effective methods used in the various phases examined, respectively, while the consistency rate was calculated by attributing a weighted average on the relationship between single objectives and single course action according to the range: absent = 0, minimum = 1, relevant = 2, very relevant = 3. The technological impact rate was calculated by estimating the weighted average of the different platforms used in the various course actions indicated by the respondents. In this case, a weight was attributed to every single action taken, according to the dichotomy absence/presence (0/1) compared to the number of each didactic action taken on every platform.

Finally, evaluation indices were constructed to estimate the rates of involvement in teaching innovation. The hypothesis is that the greater the teachers' commitment, the greater the chance the teaching innovation process is effective.

In relation to the estimation of the indices, the survey made use of multivariate and regressive techniques, as mentioned before. First, the typological indices of the intensity of the involvement of teachers in the ID in the various phases examined were constructed: pre-pandemic (IACIDPRE), during lockdown (IACIDDL), during the mixed post-lockdown phase (IACIDPL), and the index of intended future (IACIDIFI). Similarly, other indices were constructed, that are typological indices of the intensity of commitment to didactic innovation according to the teacher categories, the use of innovative assessment methods (IEC), and to the Intentional Intensity of Future Digital Platform Commitment index (IACIFDP). These synthetic indices allowed us to calculate whether the intensity is: zero (in the case of less than 20% of intended action effectively taken); weak (in the case of 21 - 60% of intended action taken; average (in the case of 61-80% of intended action taken); and intense (in the case of 80% of intended action taken). The relationship between some indices (IACIDxIEC) allowed us to estimate how committed each category of teacher was to didactic innovation and how the use of innovative assessment methods affected the activation of the ID. Furthermore, the standard deviation was checked to verify the dispersion from the mean value of the indices while, when the validity of the relationship between the synthetic indices needed to be verified, linear regression analysis was performed using the Pearson regression coefficient (r), between -1 and 1. Finally, to verify the degree of significance of the relationships between the indices, when deemed necessary, further verification was carried out using the Z-Score. The Z-Score test indicates significance when the value obtained, is equal to or less than $p < .05$. In this paper, the main results are reported and analyzed.

Outcomes

The study intentionally concentrated on university teachers more oriented towards teaching innovation, since they participated in innovative teaching projects, promoted by their universities. Not surprisingly, then, almost half (48.3%) fall into the category of 'advocates' (42.6%). The 'pandemics' (those teachers increasing their use of innovative methods during lockdown) (5.6%) are well disposed toward didactic innovation. The 'possibilists' (those who experimented with innovative methods for the first time during lockdown and intend to use them in the future) represent 28.2% of the sample, while the 'sceptics' (those critical of these methods, and do not intend using them in the future) are 23.7%.

But how much has the experience of distance learning influenced the teachers' decisions? It has certainly made an impact as most respondents (85.2%) used it during the health emergency, with no significant differences between the different categories of teachers. From the study, although it does

not seem to have had a positive impact, with respect to the first hypothesis (Ip1) the respondents, nonetheless, confirm the central role of technologies in supporting teaching.

Ip1: given that the studies confirm the usefulness of digital platforms in teaching planning and in course management, they are considered fundamental in management of innovative teaching methods.

We investigated the use of digital platforms. Even though many platforms were available, only 6 were used more than 10% of the time - irrespective of the teacher categories ($r = 0.99$), and so the in-depth analysis focused on these 6: Microsoft Teams (97.7%), Zoom (46.9%), Skype (40%), Google Meet (18.3%) and Webex (10.9%)⁵. The remaining do not reach more than 5% use by the respondents. If we look at the incidence rates of digital technologies (as tools that encourage innovative practices), we can note that only the first 3 platforms support a heterogeneous use of teaching methods with rates that touch or coincide with 100% (Microsoft Teams and Zoom 100%, Skype 95.2%), while Google Meet and Moodle, despite having specific functions designed specifically for teaching, are respectively only 49.2% and 39.7%, with Webex at just 4.5%. Regarding their intentions for future use, the respondents confirm their general willingness to use platforms, with peaks of maximum significance for those already in use (Microsoft Teams and Zoom, respectively $r = 1$) to the detriment of Moodle, which, although it has a high value, is the lowest in terms of significance ($r = 0.77$).

Table 4. Intentional Intensity of Future Digital Platform Commitment index (IA-CIFDP) (2021)

	Null	Weak	Moderate	Intense	r=	ITR=
Microsoft Teams	17,0%	6,4%	17,0%	59,6%	1	100,0%
Zoom	15,9%	2,4%	14,6%	67,1%	1	100,0%
Skype	17,4%	5,8%	18,8%	58,0%	0.98	95,2%
Google Meet	15,6%	0,0%	6,3%	78,1%	0.98	49,2%
Moodle	32,3%	3,2%	9,7%	54,8%	0.77	39,7%
Webex	16,7%	0,0%	11,1%	72,2%	0.99	4,5%

Source: data n.s. processing (2021)

While the use of digital platforms intensified during the pandemic and respondents intend to continue using them in the future, this does not mean that teaching innovation is only entrusted to technologies. On the contrary,

⁵ According the Crui' report (2020) on the state of online education in 51 universities updated at March 24, 2020, Microsoft Teams was the most used platform, serving almost 500,000, followed by Cisco WebEx, Google Meet, Microsoft Teams + Google Meet, Blackboard.

as emerges from the in-depth study of this study, teaching methods oriented towards innovation are even more decisive.

Ip2: despite the health emergency drawing attention to teaching issues, distance education has not contributed to accelerating change in favour of greater adoption of innovative practices, since it does not fully respond to the principles of teaching innovation.

Concerning the second hypothesis (Ip2), the research confirms findings in the literature on the substantial difference between distance learning (be it only remote or in mixed mode) and what constitutes innovative teaching. Not surprisingly, the intensity indices of commitment to innovative teaching are low both during lockdown (50%), and in the subsequent phase of distance learning in mixed mode (32.8%), with a high significance in the relationship between the two indices ($r = 0.96$, see Tab.4). This means that teachers are aware that innovative teaching based on a student-centered approach is not equivalent to the mere use of technology or hybrid solutions, as students are not necessarily center-staged or fully involved. Not surprisingly, the index relating to the lockdown period is the lowest value, again confirming how the emergency has not generated favourable conditions for innovation. This is further confirmed if compared (although not fully comparable as the two clusters are not completely identical) with the pre-pandemic period when the intensity of the commitment stood at a moderate level (40.2%). The respondents, in the 2021 survey, however, show an index of future intention that returns to a moderate level, with a value even higher than the pre-pandemic level (52.6%, see Table 5). This means that teachers intend at least to include innovative methods in their future teaching. Although the correlation between the intensity of commitment during the pandemic and future intention is not very significant, it still indicates a possible orientation that can be better verified in the next stage of study, when the health crisis is over. Now, besides the predictable reluctance of sceptics, interestingly, the other categories apparently intend to use blended teaching in the future, quite distinct from DAD-Distance education: this is true for 76% of the 'advocates', 80.8 % of 'pandemics' and 82.3% of 'possibilists'.

Table 5 - Intensity of Innovation Didactics' Commitment index (IACID) (2021)

	PRE	DL	PL	IFI	<i>Legend:</i>
Null	24,6%	10,7%	31,4%	25,8%	IACIDPRE=PREpandemic (2020)
Weak	24,7%	50,0%	32,8%	5,7%	IACIDL=During Lockdown
Moderate	40,2%	22,5%	13,5%	52,6%	IACIDPL=Post Lockdown (mixed mode)
Intense	10,5%	16,8%	22,3%	16,0%	IACIDIFI=Future intentions
r (IACIDLxIACIPL)=0.96					
r (IACIDL+IACIDPLxIACIFI)=0.36					

Source: data n.s. processing (2021)

As further confirmation of the hypothesis, if looking at the teaching practices activated by the four teacher types, it clearly emerges that only those who had already previously adopted innovative practices managed to make the most of them during the distance teaching period. Not surprisingly, the inverse correlation coefficients show a high significance of intensity in ID engagement among the advocates, while significance levels are low in the other categories (pandemics -0.60, possibilists -0.59, sceptics: -0.65, respectively). Furthermore, given the didactic innovation introduced (Table 5), we note how, despite teachers trying to incorporate different teaching methods, the Z-Score test confirms that only the advocates have managed to use them truly effectively, with little significance emerging in the use of some methods in the other other categories. This is particularly evident in the case of the flipped classroom, one of the most innovative models.

Table 6 - The 4 types of teachers and the innovative teaching methods carried out during the lockdown and post lockdown (mixed-phase) (2021)

	Advocates			Pandemics			Possibilists			Sceptics			TOT.	
	DL	PL	Z-Score	DL	PL	Z-Score	DL	PL	Z-Score	DL	PL	Z-Score	DL	PL
reading documents	5,7%	21,7%	<i>p</i> is < .00001	4,7%	20,7%	<i>p</i> is < .00001	2,8%	21,8%	<i>p</i> is < .00001	7,8%	24,8%	<i>p</i> is < .00001	5,4%	22,4%
testimonies	6,6%	14,9%	<i>p</i> is < .00001	4,1%	13,5%	<i>p</i> is .00318	6,6%	12,8%	<i>p</i> is < .00001	3,5%	11,6%	<i>p</i> is < .00001	5,8%	13,6%
classroom research	2,8%	11,9%	<i>p</i> is < .00001	1,4%	11,2%	<i>p</i> is .00022	7,0%	12,1%	<i>p</i> is .00016	8,0%	8,5%	<i>p</i> is .9442	5,1%	11,2%
verification quiz at the beginning/end of the lesson	4,5%	6,1%	<i>p</i> is < .00001	12,2%	10,6%	<i>p</i> is < .00001	6,6%	8,9%	<i>p</i> is < .00001	3,0%	9,7%	<i>p</i> is < .00001	5,5%	7,9%
problem-solving and case studies	8,5%	6,5%	<i>p</i> is .00236	4,7%	9,0%	<i>p</i> is .08914	4,7%	7,2%	<i>p</i> is .02444	1,6%	6,3%	<i>p</i> is < .00001	5,6%	6,8%
flipped classroom	2,3%	6,5%	<i>p</i> is < .00001	4,7%	9,2%	<i>p</i> is .0784	7,4%	7,2%	<i>p</i> is .85716	8,0%	6,3%	<i>p</i> is .08186	5,3%	6,8%
community creation	0,2%	5,0%	<i>p</i> is < .00001	0,0%	3,4%	<i>p</i> is .02382	0,5%	3,4%	<i>p</i> is .01928	1,0%	8,8%	<i>p</i> is < .00001	0,1%	5,2%
group work in the classroom, project work, and presentations of homework	17,6%	5,7%	<i>p</i> is < .00001	14,2%	4,6%	<i>p</i> is < .00001	19,9%	5,1%	<i>p</i> is < .00001	11,2%	4,3%	<i>p</i> is < .00001	16,8%	5,1%
frontal/distance lectures and slide and video projection	22,3%	4,2%	<i>p</i> is < .00001	16,2%	3,5%	<i>p</i> is < .00001	3,6%	4,4%	<i>p</i> is .48392	2,0%	3,7%	<i>p</i> is .16452	12,0%	4,1%
pre-recorded lessons	1,1%	4,2%	<i>p</i> is < .00001	20,3%	3,5%	<i>p</i> is < .00001	3,3%	4,4%	<i>p</i> is .2113	12,0%	3,7%	<i>p</i> is < .00001	5,6%	4,1%
written exercises	8,0%	3,6%	<i>p</i> is < .00001	10,1%	2,8%	<i>p</i> is < .00001	3,0%	4,0%	<i>p</i> is < .00001	2,8%	3,8%	<i>p</i> is .54186	5,6%	3,7%
peer to peer evaluations	1,8%	3,6%	<i>p</i> is .00672	1,4%	2,8%	<i>p</i> is .30772	8,3%	4,0%	<i>p</i> is .05614	14,2%	3,8%	<i>p</i> is .00386	5,5%	3,7%
joint lessons with colleagues	5,5%	3,1%	<i>p</i> is < .00001	0,0%	3,9%	<i>p</i> is .01468	9,1%	2,2%	<i>p</i> is < .00001	3,8%	3,1%	<i>p</i> is .20766	5,8%	2,9%
ex-classroom lessons and participation in conferences	10,7%	1,7%	<i>p</i> is < .00001	4,1%	0,9%	<i>p</i> is .00544	10,9%	1,6%	<i>p</i> is < .00001	11,3%	1,1%	<i>p</i> is < .00001	10,5%	1,5%
role-playing/simulations	2,4%	1,3%	<i>p</i> is < .00001	1,9%	0,4%	<i>p</i> is .03	6,3%	0,9%	<i>p</i> is .01928	9,8%	0,5%	<i>p</i> is < .00001	5,4%	1,0%
TOT.	973	4394		148	565		636	2865		557	2063		2314	9887
r(DLxPL)=	-0.90			-0.60			-0.59			-0.65			0.96	

Source: data n.s. processing (2021)

The in-depth study of the innovative teaching methods also included the analysis of the evaluation methods adopted by the teachers⁶.

Despite a very high rate of use (AR = 85%: with values that exceed the average figure for the ‘advocates’ - 98.1%, the ‘possibilists’ - 96.4%, the ‘pandemics’ - 92.4%, as compared to a low value for ‘sceptics’ - 50.6%) during the pandemic emergency, the intensity index of the commitment towards the most innovative methods is as low as zero in all categories (IEC = 42.2%), and this value is confirmed by a high significance ($r = 0.99$). In detail, the null IEC is above average in 3 categories (‘advocates’ 53.1%, ‘pandemics’ 44.4%, ‘sceptics’ 43.5%), and slightly below average among the ‘possibilists’ (39.9%). In fact, the evaluation methods most widely used by all 4 teacher categories, are mainly more traditional ones, such as written or oral final exams (39%), exercises and/or term papers and/or presentation of projects during the course, partial assessments (22.1%), and intermediate tests (20.2%), (though these tests were little used by ‘advocates’ at 9.7%). Only 10% had student work reviewed by external experts (marginal practice by ‘sceptics’), and only 5% employed peer review (mainly used by ‘advocates’ (9.7 %)). These different evaluation methods denote a greater leaning towards innovation.

Table 7 - Intensity of Innovative Evaluation Commitment Index (IEC) (2021)

	Advocates	Pandemics	Possibilists	Sceptics	TOT
Null	53,1%	44,4%	39,9%	43,5%	42,2%
Weak	16,5%	16,0%	16,3%	16,5%	16,4%
Moderate	21,7%	32,1%	38,1%	36,1%	34,8%
Intense	8,7%	7,5%	5,7%	3,9%	6,6%
	0,99	0,99	0,99	0,98	
AR	98,1%	92,4%	96,4%	50,6%	85,0%

Source: data n.s. processing (2021)

Finally, the correlation coefficient between the intensity of commitment in the ID and IE is medium-low ($r \text{ IACID} \times \text{IEC} = 0.60$). This confirms the partial and unsystematic use of innovative methods which do not necessarily lead to innovation in evaluation methods, as would happen in planned ID.

Ip3: given the level of awareness of the interviewees towards the ID modalities, there is greater attention, in the planning phase of the teaching, to make the course objectives consistent with the teaching practices used.

⁶ In the theoretical framework, we have not explored this topic for reasons of space. A recent review of contributions on the evaluation of university learning is offered in Coggi (2020). To examine in depth this issue, we recommend to see the monographic issue of Form@re, edited by Cristina Coggi, and Tonelli, Grion, & Serbati (2018), Nicol (2018) and Grion & Serbati (2019).

To satisfy the third hypothesis (Ip3), we estimated the utility rate attributed to the ID with respect to the teaching objectives themselves (RU) and the rate of consistency between teaching objectives and teaching practices used (CR). Specifically, the utility rate is quite high in all 4 teacher types, ranging from 70.5% among the ‘sceptics’ to 78.5% among ‘pandemics’. Generally, teachers find ID especially useful for increasing student participation (31.1%), developing student autonomy and active learning (18.1%), and increasing involvement in activities (11.8%, see Table 8).

Table. 8 - Usefulness of ID and reasons (2021)

	Advocates	Pandemics	Possibilists	Sceptics	TOT
Student participation increased	30,5%	29,6%	28,1%	36,9%	31,1%
Autonomy and active learning developed	18,9%	18,1%	18,2%	16,5%	18,1%
Student involvement increased	11,5%	13,4%	11,2%	12,9%	11,8%
Creativity developed	8,4%	7,9%	10,0%	5,1%	8,1%
Complex problem solving increased	7,2%	4,6%	6,6%	6,2%	6,7%
Performance improved	6,1%	4,2%	8,7%	5,3%	6,6%
Critical thinking developed	6,6%	6,5%	5,1%	6,1%	6,1%
Motivation increased	5,4%	8,8%	5,8%	6,5%	6,0%
Group cohesion increased	5,3%	6,9%	6,2%	4,4%	5,5%
TOT.	1451	216	1011	721	3399
UR=75,6%	73,0%	78,5%	75,7%	70,5%	

Source: data n.s. processing (2021)

The coherence consistency rate between the training objectives and the adoption of innovative teaching methods (CR) generally shows lower values compared to UR: they are high among the ‘advocates’ (84%), sufficient for the ‘pandemics’ (67.5%) and the ‘possibilists’ (66.4%), and not fully sufficient for the ‘sceptics’ (57.8%). Basically, the RH and CR rates show how teachers, although aware of the usefulness of ID, have not always (at least up until now) managed to exploit the most innovative teaching methodologies. Not surprisingly, the consistency rates (CR) are higher among the ‘advocates’, or only when teachers use ID over a more prolonged time span (Table 9).

Table 9 - The relationship between training objectives and ID modalities

Advocates						
	acquisition of disciplinary knowledge	inciting enthusiasm for the discipline	Critical thinking raising	application of knowledge	development of entrepreneurial skills	TOT
frontal / distance lessons and slide and video projection	23,7%	23,0%	23,8%	20,4%	21,3%	23,1%
reading documents	6,1%	6,4%	6,2%	6,1%	7,7%	6,2%
pre-recorded lessons	1,0%	1,2%	0,7%	1,6%	0,0%	1,0%
joint lessons with colleagues	5,0%	5,1%	4,9%	5,2%	1,9%	4,9%
testimonies from outsiders	6,1%	6,6%	6,3%	6,1%	3,8%	6,3%
problem solving and case studies	8,0%	7,8%	8,0%	7,4%	11,5%	8,0%
written exercises	8,0%	8,1%	8,4%	6,4%	5,8%	7,9%
role playing / simulations / role playing	1,7%	1,9%	2,0%	2,6%	3,8%	2,0%
group work in the classroom, project work and presentations of homework	17,7%	17,3%	17,4%	20,1%	19,3%	17,8%
Assessment quiz at the beginning / end of the lesson	5,2%	5,3%	5,2%	4,5%	5,8%	5,2%
peer to peer evaluations	1,7%	1,9%	1,7%	2,6%	3,8%	1,9%
classroom research	2,6%	2,3%	2,7%	3,5%	3,8%	2,7%
flipped classroom	2,5%	2,6%	2,6%	2,9%	1,9%	2,6%
ex-classroom lessons and participation in conferences	10,7%	10,5%	10,1%	10,6%	9,6%	10,4%
TOT	28,2%	28,4%	28,6%	12,7%	2,1%	2433
r (Purposes X ID)=	1	1	1	0,98	0,95	CR=84%
Pandemics						
frontal / distance lessons and slide and video projection	14,6%	15,5%	12,4%	4,0%	0,0%	13,1%
reading documents	3,1%	3,4%	5,2%	0,0%	0,0%	3,5%

pre-recorded lessons	24,0%	23,0%	19,6%	20,0%	0,0%	22,0%
joint lessons with colleagues	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
testimonies from outsiders	3,1%	2,3%	3,1%	4,0%	0,0%	2,9%
problem solving and case studies	5,2%	5,6%	5,2%	8,0%	0,0%	5,4%
written exercises	11,5%	12,2%	8,2%	16,0%	20,0%	11,1%
role playing / simulations / role playing	1,0%	1,2%	0,9%	4,0%	0,0%	1,3%
group work in the classroom, project work and presentations of homework	14,6%	11,1%	16,5%	28,0%	60,0%	15,9%
Assessment quiz at the beginning / end of the lesson	12,5%	13,3%	15,5%	4,0%	0,0%	12,7%
peer to peer evaluations	1,0%	1,2%	0,9%	0,0%	0,0%	0,9%
classroom research	2,1%	2,2%	2,1%	0,0%	0,0%	1,9%
flipped classroom	4,2%	4,5%	5,2%	8,0%	0,0%	4,8%
ex-classroom lessons and participation in conferences	3,1%	4,5%	5,2%	4,0%	20,0%	4,5%
TOT	30,6%	29,0%	30,9%	8,0%	1,5%	314
r (Purposes X ID)=	0.99	0.97	0.98	0.77	0.38	CR=67,5%
Possibilists						
frontal / distance lessons and slide and video projection	4,4%	4,3%	4,7%	4,8%	3,4%	4,5%
reading documents	2,4%	2,3%	1,7%	2,0%	0,0%	2,1%
pre-recorded lessons	3,8%	3,9%	3,8%	6,9%	10,0%	4,2%
joint lessons with colleagues	9,4%	9,3%	9,8%	9,0%	13,3%	9,5%
testimonies from outsiders	7,5%	7,5%	7,9%	6,9%	13,3%	7,7%
problem solving and case studies	5,2%	5,5%	5,3%	5,5%	0,0%	5,2%
written exercises	3,1%	2,5%	3,0%	4,1%	3,3%	3,0%
role playing / simulations / role playing	6,5%	5,9%	5,7%	7,6%	3,3%	6,1%

group work in the classroom, project work and presentations of homework	20,4%	20,5%	19,1%	15,2%	6,7%	19,4%
Assessment quiz at the beginning / end of the lesson	6,0%	5,7%	5,9%	8,3%	6,7%	6,1%
peer to peer evaluations	8,8%	9,1%	9,1%	9,0%	13,3%	9,1%
classroom research	6,3%	6,6%	5,9%	6,9%	10,0%	6,4%
flipped classroom	6,0%	7,1%	7,9%	6,9%	10,0%	7,0%
ex-classroom lessons and participation in conferences	10,2%	9,8%	10,2%	6,9%	6,7%	9,7%
TOT	30,7%	28,1%	30,1%	9,3%	1,8%	1565
r (Purposes X ID)=	0,99	1	1	0,93	0,36	CR=66,4%
Sceptics						
frontal / distance lessons and slide and video projection	2,3%	2,0%	1,7%	1,6%	0,0%	1,9%
reading documents	8,0%	7,4%	8,9%	7,3%	12,5%	8,1%
pre-recorded lessons	9,6%	9,9%	12,7%	10,6%	12,5%	10,7%
joint lessons with colleagues	4,8%	4,9%	5,0%	4,9%	6,2%	4,9%
testimonies from outsiders	3,6%	3,6%	3,0%	2,4%	0,0%	3,3%
problem solving and case studies	2,7%	2,5%	2,2%	1,6%	0,0%	2,4%
written exercises	3,8%	3,4%	3,7%	4,1%	6,2%	3,7%
role playing / simulations / role playing	10,3%	10,8%	11,4%	10,6%	12,5%	10,8%
group work in the classroom, project work and presentations of homework	13,2%	13,8%	12,7%	9,8%	18,8%	13,0%
assessment quiz at the beginning / end of the lesson	4,2%	4,0%	3,2%	6,5%	6,2%	4,1%
peer to peer evaluations	6,5%	6,5%	6,2%	8,1%	0,0%	6,5%
classroom research	8,6%	9,0%	8,7%	8,9%	0,0%	8,7%
flipped classroom	8,6%	8,3%	7,2%	9,8%	6,3%	8,2%

ex-classroom lessons and participation in conferences	11,7%	11,7%	11,7%	13,0%	18,8%	11,9%
Other	2,1%	2,2%	1,7%	0,8%	0,0%	1,8%
TOT	32,6%	30,4%	27,5%	8,4%	1,1%	1464
r (Purposes X ID)=	1	0,99	0,99	0,94	0,82	CR=57,8%
TOT						
frontal / distance lessons and slide and video projection	12,0%	12,1%	12,4%	12,1%	11,7%	12,1%
reading documents	5,5%	5,4%	5,5%	5,1%	5,8%	5,4%
pre-recorded lessons	5,4%	5,5%	5,6%	5,5%	4,9%	5,5%
joint lessons with colleagues	5,9%	5,9%	6,0%	5,8%	5,8%	5,9%
testimonies from outsiders	5,6%	5,8%	5,8%	5,5%	5,8%	5,8%
problem solving and case studies	5,6%	5,6%	5,7%	5,8%	5,8%	5,6%
written exercises	5,7%	5,5%	5,7%	5,8%	5,8%	5,6%
role playing / simulations / role playing	5,3%	5,3%	5,3%	5,5%	4,9%	5,3%
group work in the classroom, project work and presentations of homework	17,1%	16,9%	16,7%	17,1%	17,4%	16,9%
assessment quiz at the beginning / end of the lesson	5,5%	5,5%	5,5%	5,8%	5,8%	5,6%
peer to peer evaluations	4,9%	5,0%	4,9%	5,1%	5,8%	5,0%
classroom research	5,2%	5,2%	5,0%	5,3%	4,9%	5,2%
flipped classroom	5,2%	5,4%	5,3%	5,5%	4,9%	5,3%
ex-classroom lessons and participation in conferences	10,5%	10,3%	10,2%	10,0%	10,7%	10,3%
Other	0,6%	0,6%	0,4%	0,1%	0,0%	0,5%
TOT	30,1%	28,9%	28,8%	10,4%	1,8%	5776

Source: data n.s. processing (2021)

Some important aspects emerge from closer inspection of the correspondence between teaching activities used by the 4 teacher types in relation to the objectives. First, there is a low significance in the use of innovative methods in relation to the development of entrepreneurial skills, especially for 'pandemics' ($r = 0.38$) and 'possibilists' ($r = 0.36$, see Table 9). This confirms that the experimentation of innovation in DAD-Distance education in the emergency phase did not enable a more directly market-oriented training objective to be pursued. On the contrary, there are high rates of significance in the use of ID methods to achieve major objectives, such as knowledge acquisition by students, inciting enthusiasm for the discipline, and increasing critical thinking. This means that teachers - and especially those who make more use of ID - use innovative methods to achieve their 'educational' objectives, but more time is needed for better experimentation and adaptation of methods for 'formative' objectives to be achieved.

Conclusions

The study shows that, alongside traditional teaching (which must not be replaced but integrated and enhanced by ID), innovative methods can greatly enrich the didactic tools available for teachers, in the immediate future. However, arising out of necessity during the pandemic, the DAD-Distance education has not enhanced didactic innovation, but has only increased the use of technologies in terms of supporting teachers deliver classes remotely to students. Indeed, ID has suffered a setback.

From the study, although it does not seem to have had a positive impact, with respect to the first hypothesis (Ip1) the respondents, nonetheless, confirm the central role of technologies in supporting teaching.

With regard to the research hypotheses and the theoretical framework, we summarize the following conclusions.

Concerning the role of digital platforms in management of ID (Ip1), the technologies are useful and central in teaching, although they do not seem to have had a positive impact. The teaching methods oriented towards innovation are even more decisive. These results confirm and deepen the perspective about the use of technologies merely to distribute and transmit didactic input (Bruschi, 2020; Tamborra, 2021) and, at the same time, their usefulness for didactic planning and management of training processes (Tamborra, 2021).

Regarding the Ip2 about the incapability of distance education to accelerating change in favour of greater adoption of innovative practices, the research confirms findings in the literature (e.g. Salmieri & Visentin, 2020) about the substantial difference between distance learning and what constitutes innovative teaching. As further confirmation of the hypothesis, the

teaching practices activated by the four teacher types show varied approaches to the use of ID methods. We do not observe a polarization, identified by Ramella & Rostan (2020), between those who do not intend to retain aspects of emergency distance learning, and those who are open to innovation. We are aware this result is affected by the main characteristic of the sample, consisting of academics more oriented towards teaching innovation, as we specify below about the limitation of the study.

Finally, regarding the Ip3 about the greater attention, in the planning phase of the teaching, to make the course objectives consistent with the teaching practices used, the research enriches the perspective put forward by Gambardella et al. (2020). The scholars encourage the investigation of the use of platforms to assess how far they can contribute to the renewal of teaching practices: this study throws light about the wider role of ID, also based on digital technology (not only of the platforms) in the redefinition of the academic profession and practices of teachers.

The third phase of this study will try to verify whether the experiences of this period will produce a new phase in the evolution of ID. From this study, we could hypothesize that, after a period of adjustment and post-pandemic “normality”, higher values of use, awareness of ID usefulness, and greater consistency between objectives and teaching and assessment methods, are likely. Only at that point, can feedback on the students and their inclusion in the research be possible. Our future aim is to use them as a cluster to compare the different methods chosen by teachers, to assess how effective each method is in terms of both learning, and in involving students. However, this research can also be an interesting reference point for ‘photographing’ how innovative teaching methods are used in Italian mega universities, and can be a useful tool, applicable to both other Italian and European universities, to further extend the comparison between several universities.

Two limitations of this study are related to the choice of the sample consisting of teachers involved in projects of didactic experimentation and consequently more oriented towards teaching innovation. Firstly, in each university a lot of academics adopt innovative teaching methods. Despite their value, these experiences have not been considered in our sample to avoid ‘isolated’ and ‘individual’ cases. In fact, we think a systematic process of change in universities needs first of all (but non-exclusively) the involvement of the governance and the institutional support. Moreover, we have focused the attention on ID methods, and their usefulness and reasons. As the results show, there are ‘sceptical’ teachers who consider ID ineffective. The approaches to didactics can be even more varied and include critics and negative perceptions and behaviours towards ID projects and ID in general.

Considering these limitations, future research could involve other academics, not only those who are involved in ID projects, to enlarge the per-

spective in two main directions: firstly, to deepen the role of ID experiences bottom-up processes, promoted and stimulated by teachers individually; secondly, to understand the point of views of professors who could be critical towards ID and to deepen the reasons for which ID it is not promoted.

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