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Learning by participating: the new collaborative and cooperative dimension of online Laboratories in the L-19 degree course at Unidav

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Abstract: This study analyses the redesign of the online Laboratories of the Degree Course in Educational Sciences (L-19) at Unidav, assessing the possibility of applying a socio-constructivist paradigm focused on 'learning by doing' in distance learning. The effectiveness of the teaching framework, based on asynchronous video lectures and synchronous group 'lecture encounters', was investigated using a structured questionnaire administered to the 151 students attending the first runs of the redesigned Laboratories. A total of 133 students responded, recording an overall response rate of 88.08 per cent. The results highlight broad agreement regarding the equality in the division of tasks, the atmosphere of confidence, experiential learning linked to a tangible product and the enhancement of understanding achieved also through practice rather than theoretical study. Furthermore, cooperative interaction reduced the respondents' perception of isolation. Some of the most highly valued aspects included the acquisition of professional skills and direct contact with the lecturer. In conclusion, the data confirm that the workshop model, reconfigured in this way, reduces the transactional distance typical of e-learning, effectively integrating peer-to-peer co-construction with the facilitator's presence to develop operational and interpersonal skills.

Keywords: educational technologies; learning by doing; online community of practice; collaborative and cooperative learning; workshop-based teaching;

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1. Introduction

In a fully distance-learning context where educational communication is facilitated, centred on and mediated by an interactive multimedia computer connected to the internet (Luciani, 2022a), and where the pedagogical-didactic dimension is that of CMC (Computer-Mediated Communication) (Ardizzone & Rivoltella, 2003; Galliani, 1999, 2000a, 2002, 2004, 2005; Luciani, 2001; Trentin, 1998, 2004), is it possible to offer workshops whose teaching model is inspired by the social constructivist paradigm (Varisco, 2002)? Is it possible, in this pedagogical and didactic framework, and across different types of learning content, to fully and productively develop group work, active and participatory interaction between participants, collaborative and co-operative operational dimensions, and 'learning by doing', contributing to the creation of a community of practice (Wenger, 1998) that continues after the end of the course?

Based on our direct experience and research, the answer to these questions has historically been positive (Luciani, 2014a, 2022b). That is the reason why, when in

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the second half of 2025, as part of Degree Programme L-19 at the 'Leonardo Da Vinci' Online University, the demand to review and reformulate the model of the online Laboratory courses for both specialisations (Early Years Educator; Social Educator) emerged, we accepted the challenge by deciding to try to adapt and reconfigure a workshop-based teaching model which – having been consistently tested over time, updated and adapted as and when necessary to suit different learning content and technological possibilities – comes from a long and significant history of pedagogical-didactic activism dating since the 1950s and 1960s (Luciani, 2016).

From the initial design and academic year of its first delivery (2020–2021), this degree programme has provided an educational pathway in which an initial phase – dedicated to acquiring basic theoretical knowledge in the fields of pedagogy, psychology, sociology, history and philosophy – is followed by a second phase in which this knowledge is explored in greater depth and applied, also through workshop activities. In this educational framework, the Laboratories are intended to serve as a key educational element bridging theoretical knowledge and practical contexts, with the objective of developing specific skills.

In order to meet this educational objective, the pedagogical-didactic design of the workshops naturally had to adopt an approach that incorporated an active, cooperative and collaborative learning dimension, based on group work, 'learning by doing' through meaningful real-world tasks, and oriented to the creation of communities of practice (Giunta, 2017; Bertagna, 2012; Fioretti, 2010; Micheli, 2008; Frabboni, 2004; Baldacci, 2004; De Rossi & Montani, 2001). After all, the workshop – understood in pedagogical terms – is the place where the lesson is realised as a co-construction, where students become the protagonists of its development and modelling in a way that is more closely attuned to their individual characteristics (aptitudes, abilities, inventiveness, creativity, curiosity, determination, etc.), effectively immersed in a community of practice (Wenger, 1998), which is also a learning community (Fioretti, 2010), and supported and stimulated by the teacher-tutor in their role of supporting/coordinating this educational and training process. It is in this understanding of the workshop experience that the dynamics and educational-training processes of 'learning by doing' (Dewey, 2012/1916), learning through experience, through active participation in the design process, and where theory is not separated from practical application, stimulating students to reflect on the implementation process and the results achieved (Dewey, 2012/1916). This is done by enabling students to devise a project and directly experience the outcome of their own actions, increasing their level of consciousness regarding the content of their various experiences, as well as enhancing their cognitive development, their ability to implement research strategies by discerning their general principles, and their skills (Fioretti, 2010). At the heart of the teaching and learning process is the dimension of real-life experience. The direct motivational involvement of students in the creative-realisation process to be explored is one of the fundamental components of the model and its objective is to verify whether or not the given project hypotheses are accurate. In this dialectical interaction between action and thought, the workshops constitute "... percorsi di socializzazione e apprendimento sotto la bandiera prassi-teoria-prassi quale unico 'triangolo' di riconoscimento scientifico." (Frabboni, 2014, p. 86).

In the collaborative and co-operative dimension of the workshop, the activities performed by the students are not only focused on achieving the learning and educational objectives set out in the didactic project, but are also implemented in relation to the very same co-operative and collaborative (communicative) group dynamics that make the process of acquiring knowledge and skills more efficient, more effective and, at the same time, a shared experience: by collaborating and cooperating, students bring their own personalities into play, while at the same time relating to one another and to themselves in a way that is also formative from a human perspective. Not only does this significantly enhance the active dimension of learning, but at the same time, students immersed in a community of practices, discourse and learning – that is, the group and the collective of groups – can improve the quality and depth of the knowledge they have acquired, as well as develop and/or refine their social-relational skills (Sandrone, 2012).

The laboratories of Unidav's L-19 degree programme are guided by lecturers in collaboration with subject-specific and technical e-tutors, and are organised on a progressive basis, both within the laboratories themselves and in relation to the subject-specific course content, with the aim of promoting, as far as possible, an integrated approach to learning that combines theoretical and practical dimensions.

The schedule for the curricular Laboratories, divided by year group, is currently as follows:

Workshop	**Field of study**	**Year of course**	**CFU**
Observation of children's behaviour	Early Years Educator	I	3
Play and Creativity Methodologies	Early Years Educator	III	3
New technologies for learning	Early Years Educator	III	2
Observation in educational settings	Social Educator	I	3
Active and inclusive teaching methods	Social Educator	III	3
New technologies for learning	Social Educator	III	2

Until we became engaged in the project, the teaching model outlined was essentially based on the knowledge-transfer aspect of synchronous workshop sessions, supplemented by a final assignment involving project work to be carried out individually, which was then presented and discussed during a concluding oral session aimed at assessment.

The new teaching design was also developed on the basis of personal experience in the field regarding the implementation, delivery and coordination of laboratory-based teaching in face-to-face, blended and fully remote formats, accompanied over time by scientific studies and results related to those specific experiences (Luciani, 2002; Luciani, 2004; Luciani, 2005; Luciani, 2013; Luciani, 2014b; Luciani, 2022b). Moreover, this didactic redesign was not solely the result of a bottom-up process. Instead, it involved all the lecturers from the Laboratories, the programme, subject-specific and technical e-tutors, the Degree Programme Coordinator, and all other lecturers on the Didactic Commission. In this way, the planning process also took the form of an unstructured and indirect training opportunity for Faculty Development.

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As part of the redesign of the teaching model for the workshops, two pathways have been established: one for attending students and one for non-attending students. This article focuses on the training pathway for **attending students**.

As a result of the project objectives outlined above, although it was decided to retain the introductory video lessons for the workshop for asynchronous viewing – as these are considered a fundamental prerequisite for providing students with a significant portion of the content required for the subsequent workshop activities – the additional synchronous sessions have been restructured as 'lecture-sessions' designed to facilitate collaborative and cooperative group work.

The workshop is structured and delivered as follows:

- at least 1 hour of recorded video lectures per credit;
- at least 2 hours of synchronous, productive, interactive, collaborative and co-operative workshop sessions per credit, with recordings of the introductory sections to the workshop activities remaining available on the platform.

The didactic project requires that students attending the workshop must first have completed the asynchronous online video lessons, must have studied any texts or teaching materials specified in the learning pathway set out by the lecturer, and must subsequently take an active and hands-on part in the scheduled synchronous workshop 'lecture-sessions'. The synchronous sessions of the workshop-based course are designed to lead to the creation of one or more group workshop projects; the successful and complete realisation of these projects is required to achieve the course qualification.

Significant attention has also been given to subject-specific and technical e-tutors in their role of supporting lecturers, with the aim of facilitating, in the field, the effective peer-to-peer development of a true collaborative and co-operative community of practice and discourse. In fact, it has long been scientifically established that the quality of e-learning experiences depends increasingly on tutors who are prepared to manage online interactions (Galliani, 2005b).

A pedagogical and didactic reflection was also conducted on the assessment aspect. We have moved from requiring students to complete an individual project, which was then uploaded to the Laboratory's online space on the platform, viewed by the lecturers, and finally presented in an oral session to obtain a pass, to a system where a pass is awarded based on an assessment that is as formative as possible and linked to the overall progress of the workshop process. What is now assessed, therefore, is the complexity of the workshop's educational activities: the use of the video lessons and specified didactic materials, active and constructive participation in the workshop as it progressed, and the successful and positive realisation of the group work.

The first workshops organised using this new teaching method were delivered between February 2026 and May of that year.

2. Materials and Methods

The research tool selected to validate the reconfiguration of this part of the Unidav L-19 degree programme's curriculum – and, in particular, the new didactic-formative methods adopted – was a self-administered questionnaire distributed to a non-probabilistic sample (Trinchero 2002, 2004). Using a random sampling method, an anonymous online questionnaire – designed to be as straightforward as possible

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– was presented to enrolled students via a Google Form, with the aim of exploring their opinions and views regarding, in general, the effectiveness and efficiency of the teaching model adopted. We chose a questionnaire that we defined as 'streamlined' as we preferred to focus strategically on maximising participation and response rates. Therefore, the structure of the questionnaire and the number of questions were designed and defined in the hope that this streamlined format would better suit the nature of a supplementary activity undertaken by students on a strictly voluntary basis.

The questionnaire consists of a set of eleven questions, ten of which are based on a five-point Likert scale, whilst the last one allows respondents to select up to three answers from a predetermined list of eight options, presented in a different order for each respondent.

In this case, the research methodology is clearly quantitative and has been used both to evaluate the specific type of training programme we have developed, and in an exploratory perspective with regard to the general pedagogical-didactic dimension of the Laboratory as an important and highly contemporary 'teaching technology' (Galliani, 2000b).

A total of 151 students took part in the first editions of the Laboratories. Between the beginning of July 2026 and the end of that same month, all enrolled students were contacted by email by the technical e-Tutor, who provided them with a brief presentation of the research project and its aims relating to the improvement of teaching, as well as a link to the online form for them to compile.

3. Results and discussion

133 students responded to the questionnaire out of 151 invitations sent out. As indicated above, the figure of 151 corresponds to all students who, as **attending students**, undertook at least one didactically redesigned workshop. It follows that, relative to the reference population, the response rate achieved was 88.08 per cent. Such a high level of participation means that, although participation was voluntary (resulting in a non-probabilistic sample), the data acquire significant descriptive and operational relevance for the specific context of these learning experiences. In effect, this constitutes a 'quasi-census' of this experience.

The **first question** in the questionnaire sought to investigate the extent of students' participation in workshop activities, asking: 'During the 2025–26 academic year, did you take part in just one workshop or in more than one?'. The results show that the clear majority of respondents, amounting to 78.2 per cent, attended more than one workshop, whilst the remaining 21.8 per cent took part in just one.

This finding provides further evidence of the robustness and reliability of the data collected. It follows, in fact, that almost the entire sample is not basing their judgement on a single, isolated instance, but rather on a varied and continuous educational experience. This level of participation ensures that subsequent assessments are grounded in an in-depth and comprehensive understanding of the proposed teaching model.

The **second question** focused on the infrastructural and technological aspects of the experience, asking: 'Were the platform and the associated communication tools suitable for conducting online activities?'. The options on the Likert scale used were 'Strongly disagree' (value 1) and 'Strongly agree' (value 5).

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Analysis of the data reveals a largely positive assessment: the vast majority of respondents stated they 'Strongly agree' (66.9%) or 'Mostly agree' (20.3%), aggregating an overall consensus of 87.2 per cent. In addition, 10.5 per cent of responses were rated as 'Satisfactory' (value 3), whilst negative opinions remained entirely marginal, standing at 1.5 per cent for 'Partially disagree' and 0.8 per cent for 'Strongly disagree'.

This strong favourable sentiment represents a crucial contextual factor. In the field of digital learning, technology effectiveness is the fundamental enabling condition: the absence of technical issues demonstrates that the infrastructure supported the experience in a substantially positive way. This outcome isolates and reinforces the validity of the subsequent responses, which can thus be interpreted as a direct expression of the quality of the didactic redesign, ruling out any distortions or biases linked to platform malfunctions.

The **third question** explored the aspect of teamwork and collaboration amongst peers, asking: 'Within the group, were tasks divided fairly and were everyone's contributions incorporated into the final result?'. The same 5-point Likert scale used for the previous question was also adopted for this assessment.

The results confirm the effectiveness of the interpersonal dynamics established: 72.2 per cent of respondents stated they 'Strongly agree' and 18.0 per cent expressed 'Agree' (score 4), resulting in an overall consensus of 90.2 per cent. 9.0 per cent rated it as 'satisfactory' (score 3), whilst negative ratings remained minimal (2.3 per cent for score 2 and 0.8 per cent for 'Strongly disagree').

These figures highlight how the student body, supported by the facilitation of lecturers and e-tutors, has succeeded in working effectively according to principles of collaborative and co-operative learning. The equitable distribution of tasks and the effective integration of individual contributions attest to the validity of the pedagogical-didactic methods implemented, which have been able to overcome the traditional challenges of group work in digital contexts.

Closely linked to the theme of collaboration, the **fourth question** examined the quality of the working atmosphere within the teams, asking: 'Was there an atmosphere of confidence and mutual support within the working group?'.

Here too, the distribution of the data highlights an excellent level of rapport: 72.2 per cent of respondents expressed strong agreement (score 5: Strongly agree) and 19.5 per cent gave a score of 4, resulting in an overall consensus of 91.7 per cent. 7.5 per cent indicated an intermediate level of satisfaction (score 3), whilst negative responses were non-existent at score 2 (0 per cent) and accounted for just 0.8 per cent at the 'strongly disagree' end of the scale (score 1).

This result confirms that the collaborative and co-operative dimension was not limited to a mere technical division of tasks, but triggered profound and complex communicative and relational dynamics within the group. The development of solid interpersonal confidence and mutual support attests to the creation of a genuine online community of practice and learning, in which the affective-social dimension acted as a catalyst for subsequent cognitive processes.

The **fifth question** addressed a central theme in the contemporary scientific debate on distance learning: the risk of student isolation. The question explicitly explored this aspect by asking: 'Has online interaction with fellow students reduced the sense of isolation typically associated with distance learning?'.

The responses confirm the effectiveness of the teaching model adopted as a countermeasure to transactional isolation (Moore, 1993): 67.7 per cent of respondents stated they 'Strongly agree' (score 5) and 23.3 per cent expressed 'Agree' (score 4), resulting in an overall consensus of 91.0 per cent. 6.0 per cent took a middle ground (score 3), whilst negative ratings accounted for 0 per cent at score 2 and a remaining 3.0 per cent at the 'strongly disagree' end of the scale (score 1).

This outcome highlights how the pedagogical-didactic approach based on active, collaborative and cooperative online workshops has a strong inclusive value. Structured peer interaction has proven capable of significantly mitigating the sense of loneliness typical of virtual environments. Barring a few limited subjective exceptions, the teaching approach implemented not only facilitated the acquisition of skills but also effectively addressed a fundamental socio-emotional need, breaking the isolation inherent in distance learning.

The **sixth question** explored the cognitive dimension of peer learning, asking: 'Do you think that peer interaction has improved the quality of your learning compared to studying on your own?'.

Here too, the responses highlight broad agreement on the effectiveness of this interaction: 66.9 per cent of respondents stated they 'Strongly agree' (score 5) and 18.8 per cent 'Agree' (score 4), resulting in an aggregate positive rating of 85.7 per cent. 10.5 per cent took a middle ground (score 3), whilst negative assessments remained marginal, standing at 2.3 per cent for score 2 and 0.8 per cent for 'Strongly disagree' (score 1).

This outcome reinforces one of the fundamental elements of the socio-constructivist shift in educational practice: moving beyond the cognitive isolation of individual study in favour of an active co-construction of knowledge. Peer discussion is not perceived by students as a mere relational exercise, but rather as an effective means of enhancing and improving the quality of learning.

The **seventh question** explored students' perceptions regarding the acquisition of soft skills, asking: 'Thanks to these workshops or this workshop (if you attended only one), do you feel you have developed or improved your teamwork and online communication skills?'.

The distribution of responses shows a significantly positive outcome: 66.2 per cent of participants stated they 'Strongly agree' (score 5) and 26.3 per cent 'Agree' (score 4), resulting in an overall agreement rate of 92.5 per cent. 5.3 per cent took a middle ground (score 3), whilst negative responses were minimal, with 1.5 per cent selecting score 2 and 0.8 per cent selecting score 1.

This data suggests that the training programme went beyond the mere transmission of content and effectively contributed to the development of relational and digital communication soft skills. The acquisition of these skills, developed within the workshop framework, generates a potential spillover effect (Bransford, 2000): mastery of online collaboration and communication processes is a methodological asset that students can capitalise on and apply positively both to other aspects of their e-learning university studies and in future professional contexts.

The **eighth question** focused on the pragmatic and experiential aspects of the model, asking: 'To what extent do you feel that creating the workshop product stimulated your learning through hands-on activity?'. For this specific survey, the

ends of the 5-point Likert scale were redefined as 'Not at all' (value 1) and 'Very much' (score 5).

The focus on the practical process resulted in a response that was clearly polarised towards the higher scores: 62.4 per cent of respondents indicated the highest level of stimulation ('Very much'), whilst a further 28.6 per cent selected score 4, resulting in an overall positive perception of 91.0 per cent. 6.8 per cent of responses fell into an intermediate category (value 3), whilst negative assessments remained statistically marginal, accounting for 1.5 per cent at value 2 and 0.8 per cent at value 1.

The result indicates that, thanks to the workshop format designed in this way, the acquisition of content and skills has been significantly enhanced. The guided creation of a tangible product effectively acts as a powerful catalyst for cognitive processes, confirming Dewey's theoretical premise that real-world experience is the foundation on which reflection and the consolidation of knowledge are built.

The **ninth question** sought to make a direct comparison between two different learning methods by asking: 'Did having to create a tangible workshop product together with peers facilitate a practical understanding of the content compared to traditional theoretical study?'. For this item too, the Likert scale was used, anchored at the extremes 'Not at all' (value 1) and 'Very much' (value 5).

The distribution of responses highlights a clear and significant endorsement of the teaching model introduced: 64.7 per cent of respondents rated it at the highest level of approval ('Very much so') and 25.6 per cent at value 4, resulting in an overall consensus of 90.3 per cent. 8.3 per cent expressed an intermediate opinion (value 3), whilst negative ratings were extremely low (0.8 per cent for both value 2 and value 1).

This data indicates that in learning contexts, including e-learning, the acquisition of theoretical knowledge risks remaining abstract unless supported by a means of real-world application. The requirement to work together with peers towards the co-construction of a concrete artefact acted as a facilitator and cognitive catalyst, enabling students to internalise the theoretical content through its practical application and real-world relevance.

The **tenth question** was designed to elicit a holistic and comprehensive assessment of the entire training programme, asking: 'Overall, how would you rate your experience of this type of online workshop?'. For this item, the ends of the Likert scale ranged from 'Not at all positive' (score 1) to 'Completely positive' (score 5).

In line with the findings from the previous questions, the overall rating is at significantly high levels: 71.4 per cent of respondents rated the experience as 'Completely positive' and 23.3 per cent gave a rating of 4, resulting in an overall approval rate of 94.7 per cent. 3.0 per cent expressed a neutral view (score 3), whilst negative responses remained very marginal, with 0.8 per cent giving a score of 2 and 1.5 per cent a score of 1.

This clear convergence towards the area of full positivity indicates the overall efficacy of the new teaching model. The data summarises the students' appreciation not only for the individual components (infrastructure, interpersonal relationships or operational aspects), but also for the pedagogical-didactic structure of the redesigned Laboratories as a whole, thereby providing empirical validation of the strategic framework that has been implemented.

The **eleventh question** was designed as a final assessment of the entire survey, requiring respondents to select a maximum of three aspects they most appreciated from a set of eight options presented in random order. This restrictive selection method forced respondents to rank the factors by preference, providing a picture of particular internal consistency. The question was as follows: 'Which aspect of this didactic method used in the workshop did you appreciate the most? (max. 3 answers)

1) The collaborative and cooperative dimension
2) The didactic structure of the various stages of the workshop activity
3) The didactic model as a whole
4) The originality of the workshop programme
5) The overall growth in personal awareness
6) The direct contact with the lecturer
7) The development of the group's communication and collaborative dynamics
8) The acquisition of workshop-based teaching-educational methodologies that could potentially be implemented in future professional practice'

The data show that response 8 (52.6 per cent) was the most popular, relating to the acquisition of practical skills applicable to future professional practice, followed by response 6 (49.6 per cent) concerning direct contact with the lecturer. Close behind are response 1 (45.9 per cent), relating to the collaborative and co-operative aspect, and response 7 (40.6 per cent), focusing on the development of group communication and project dynamics. Intermediate levels of support were recorded for the growth of personal awareness (answer 5 – 24.1 per cent), the teaching model as a whole (answer 3 – 18.8 per cent) and the originality of the programme (answer 4 – 13.5 per cent), whilst the timing of the teaching programme accounted for a residual percentage (answer 2 – 3.8 per cent).

The strong polarisation towards response 6 calls for an objective interpretation firmly anchored to the specific nature of the macro-educational context of today's online universities. In purely e-learning environments, the limited opportunities for synchronous interaction with teaching staff represent a structural issue felt by at least some students; the introduction of "lesson meetings" has specifically addressed this latent need, transforming the teacher's presence into an enabling and reassuring factor. Far from disproving the effectiveness of cooperative learning, the centrality of contact with the lecturer complements, in a synergistic manner, the high level of satisfaction expressed regarding professional development and group dynamics (responses 8, 1 and 7). The active co-construction of knowledge and Deweyan 'learning by doing' have proved to be significant precisely because they are embedded within a dense relational ecosystem, capable of forging a link between peer interaction and the immediate support of the teaching team.

5. General conclusions

Beyond the detailed interpretative descriptions provided for each item in the previous paragraph – which enable us to conclude with a fully positive answer to our research questions – a general, and for us inevitable, systemic conclusion also emerges.

Once again, we feel we can state that the problem of educational quality, of students' active participation, and of the full development of their knowledge and skills, does not lie in distance learning via e-learning, but rather in the operational

model (economic, administrative, academic, pedagogical) that Italian universities have adopted (particularly online universities, but also those offering face-to-face teaching) (Luciani, 2024), or better said, which they have not adopted. It is not the technologies themselves that inhibit educational quality, but their insufficient and inadequate didactic implementation within formative processes. However, for this to actually happen, it is the economic and educational models – both of which have so far tended to be primarily speculative – that must change.

It has long been recognised in educational circles that distance learning certainly entails a technological cost, but that this cost is primarily linked to professional growth and human resource development, and that it increases progressively as the quality of the training provision improves (Ardizzone & Rivoltella, 2003; Galliani, 2005b). Delivering distance learning via e-learning requires a greater financial investment, not a lesser one, than face-to-face teaching. Training is required for teaching staff and the administrative apparatus – including its adaptation and implementation – as well as for students; there is also a need for the constant updating of technologies, managed by new professional roles specifically trained in web-based instruction (e-tutors, technicians, content editors, multimedia producers, instructional designers, project managers, etc.): in order to achieve the effective quality of education in e-learning, this is not an option but **a necessity**.

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