

## Feedback strategies in distance education: a survey of university students

Maila Pentucci<sup>a</sup>, Chiara Laici<sup>b</sup>

<sup>a</sup>University “G. d’Annunzio” of Chieti-Pescara, Italy, maila.pentucci@unich.it, 0000-0003-3826-8128

<sup>b</sup>University of Macerata, Italy, chiara.laici@unimc.it, 0000-0002-8013-1179

### Abstract

*Screen-mediated teaching at the university level has necessitated a redesign of learning environments across various dimensions, encompassing epistemological, relational, and pragmatic aspects. How can the Digital Learning Ecosystem nurture these dimensions? Does the ecosystem initiate a feedback loop between the teacher and the student, configured not only as an evaluative process but also as a reflective and adaptive one? The feedback loop holds a generative value; it triggers an internal process in the student, enabling them to construct knowledge about their ongoing activities and comprehend through their own evaluative acts. Students stand as the ultimate source of all feedback; they are the ones who ultimately generate it, and it is this process that catalyzes learning. Feedback strategies further promote alignment between the teacher and the student, fostering continuous redesign and co-design.*

*The paper aims to present a survey collecting students’ perceptions on the condition of separation between professors and students during distance learning and activation of the educational relationship and feedback through digital devices.*

**Keywords:** *Digital Learning Ecosystem; Feedback; Distance learning; Perceptions; Interaction*

### Introduction and background

In screen-mediated teaching situations, such as those implemented by Italian universities during the 2 years of the coronavirus disease 2019 (Covid-19) pandemic, the teacher’s design competence becomes central. The teachers cannot simply transfer the teaching action from the classroom to the screen (Rivoltella, 2021); rather, they must redesign the learning environment in its various dimensions (Vinatier, 2013). The following aspects need to be reconsidered: 1) Epistemological aspects: the selection and transposition of knowledge need to be rethought. Knowledge must be meaningful and connected to students’ experiences (Rossi & Pentucci, 2021). 2) Pragmatical aspects: learning system must be designed to provide scaffolding, feedback, and metacognition in both physical and digital environments (Goodyear, 2020). 3) Relational aspects: group relationships and interactions must be built by thinking about a new concept of immaterial space, a “metaverse” crossing the space–time limits of the classroom (Collins, 2008).

This was evident during the forced disruption of social interactions amid the pandemic. Rapidity and feasibility have limited the planning choices, but at the same time, the unprecedented situation has enhanced the use of regulation in action, generating some new solutions to intractable problems (Head et al., 2002). Some topics that will have to be taken into account in the post-pandemic learning design have risen, like sustainability, resilience, a new meaning to give to the concept of inclusion. In addition, reflecting upon new corporealities and crossover identities between physical and digital forms of interaction and exchange between professors, students, environments, and technologies populating the environments and finally on the reconceptualization of blended teaching and learning has become unavoidable.

This has highlighted the importance of designing the learning environment as a Digital Learning Ecosystem, defined by Jeladze et al. (2017) as a socio-technical adaptive ecosystem populated by digital “species” (tools, services, resources) and by social agents (students, professors, technicians) mutually connected, reproducing what happens in a biologic ecosystem, within which two components interact: the biotic one, made of living organisms, that is, the different species, and the abiotic one, made of the elements of the environment, that is, air, soil, temperature, light, and others.

The concept of ecosystem, handed over to educational situations (Uden et al., 2007; Våljataga et al., 2020), sees the ongoing dialog and the interchange between a plurality of factors, where aggregation and hybridization of technologies, methodologies, tools, and solutions activate recursive paths (Bannan et al., 2016). What is digital grants dynamism to

the architecture of such an ecosystem, the digital environments become the immaterial interface between the educational experience and the personal and collective one, realized “elsewhere” in comparison to the space–time of formal learning: the space of the action where the fragments coming from the multiplicity in organized and situated knowledge (Rossi & Pentucci, 2021).

Among the factors enabling the activation of positive interactions, both in the generation of knowledge and social relationships, feedback is to be considered central (Nicol, 2018). Feedback operates on three levels: the cultural one, the intrapersonal one, and the interpersonal one (Fishman & Dede, 2016). It helps the student become more aware of the learning process, facilitating the reconstruction and sedimentation of knowledge (cultural); it activates metacognitive and reflective postures (intrapersonal); it supports socially oriented approaches to knowledge (interpersonal), as it is determined by interaction (Laici, 2021; Carless, 2020).

This contribution is situated within this framework to understand how a digital ecosystem supported by continuous feedback processes could have enhanced student learning during the period of distance education.

In particular, to formulate the research questions, we started from the assumption of Carrillo and Flores (2020): in the contexts of higher education mediated by screens during the pandemic, learning is “the result of the interaction of three presences” which the digitalization of communication cannot circumvent: (a) social presence (the ability of participants to engage effectively, to communicate in a collaborative environment, and develop interpersonal relationships); (b) cognitive presence (the way participants “construct meaning through sustained reflection and communication in a community of inquiry”); and (c) teaching presence (designing, facilitating and directing social and cognitive processes to achieve significant learning outcomes) (pp. 468–469, *passim*).

As a consequence, we posed the following inquiries: Did the digital ecosystem crafted by educators effectively facilitate “social presence” during the educational experience? Was feedback perceived as a valuable element in activating “cognitive presence” and fostering a sense of “teaching presence” support among students?

## **1. Description and method of the survey**

The contribution aims to present the results of a survey administered to 274 students from six degree courses in pedagogical and didactic disciplines, taught by four professors, in two different universities in central Italy<sup>1</sup>.

The survey aimed at verifying the perceptions (Ceconi et al., 2019) toward the educational ecosystem designed for the didactic in Covid-19 emergency and reused in the following years for blended or integrated teaching (years 2019–2020, 2020–2021, 2021–2022). The questionnaire included nine questions, structured in two parts: the first one, semi-closed, asked to identify an option among a series or to make a choice between two judgments and the second one asked to clarify the reason of such a choice, through the positioning of “why.”

The collected data were analyzed according to a qualitative approach, through identification, by the post-codification, of homologous semantic fields manually identified. Linguistic occurrences were preemptively cleansed to isolate common and recursive conceptualizations among the different answers (Ferrari & Piccardi, 2010).

The designed ecosystem was based on the pivotal role of feedback as generative and constituting device of the didactic action (Pentucci, 2021) in its different dimensions: cognitive, that is linked to learning strategies and knowledge building, intrapersonal, that is aimed at the building of the self, and interpersonal, that is based on cooperation and communication (Fishman & Dede, 2016).

All the professors had activated the same model of integrated digital educational ecosystem using the same digital tools and planning different types of activities that were very similar to one another due to their structure and reference methodology.

The courses were supplied through the platform Teams by Microsoft, as a synchronous didactic tool, where students attended the virtual classes linked to specific teachings. Other tools were aggregated to the platform to build a dynamic environment, also enriched by what was produced by the students.

According to the principle of hybridization, some technologies and tools were used, both typically designed for the didactic and generalist ones, rethought either to realize or support some moments of the didactic action.

In detail, starting from Content Management System (CMS), which preserved the recording of synchronous lessons, the students had at their disposal:

- a chat (Telegram) used both for quick communications from the teacher to the students (channel) and for short didactic interactions (group) between the teacher and students, such as summary questions, micro-exercises, activity, and peer feedback;
- a series of repositories to hold videos (YouTube channel), documents, and reports (Google Drive); and
- tools for conducting feedback activities, such as Google Modules, returned both synchronously during lectures and asynchronously via teacher communication.

<sup>1</sup> The courses were: “Didactics” and “Special Pedagogy” (Educational Sciences, University of Chieti, held by Maila Pentucci); “Laboratory of Educational Technologies” and “Technologies of Instruction and Learning” (Primary Education Sciences, University of Macerata, held by Chiara Laici); “Didactics of Education” (Pedagogical Sciences, University of Macerata, held by Lorella Giannandrea); “General Didactics” (Primary Education Sciences, University of Macerata, held by Pier Giuseppe Rossi).

In the light of such an experience and within the perspective of its possibility of being repeated in future situations, not under emergencies, it was considered as appropriate to ask the students to collect their opinions and conceptions, to understand both the strong and weak points perceived and the perceptions toward the feedback process activated and the possibility of interaction.

## 2. Results and discussion

The analysis of the answers was oriented, in particular, to understand:

1. the level of usefulness perceived by the students of the digital ecosystem based on the activation of feedback to make the didactic experience more active and involving and
2. how feedback was useful for
  - supporting learnings (cognitive presence),
  - activating the relationship with the professor (teaching presence), and
  - the relationship between peers (social presence).

### 2.1 Perception of the digital ecosystem as a community of practice

On analyzing the first point, it was found that the students declared that they perceived the direct dimension of communication, interaction, exchange, and socialization as decreased.

In their responses, students expressed concerns about the absence of face-to-face interactions with teachers and peers. One student articulated: “I think it is a very crucial thing to have two gazes interacting because through it, you can observe numerous nuances that might be missed in an online lesson.”<sup>2</sup>

The screen, for them, acts not as a filter but as a barrier. This can potentially impact the learning process. According to Damasio (2000), knowledge is acquired and developed by the organism as a feeling produced by the body in action, a sensation of the body while actively engaging with the world. In other words, mind and body are inseparable, and similarly, body and movement constitute a unity that organizes a profound degree of self-memory within a vital and situational pattern, responding to bodily, biological, and material circumstances. As highlighted by Lo Presti (2016, p. 57), “Before being situated in an environment, in a culture, in a context, or within a system of relations, the individual is thus originally self-situated in himself, in his own bodily biologicality, in the absolute ineliminability of his own body. Being through a body that acts in an environment, understood both as a physical place and as a socio-affective and cultural context, is, therefore, the necessary and fundamental condition that allows the individual to learn, to construct knowledge, to form.”

Furthermore, students underscore the absence of the social dimension in university life, which they perceive as lacking in the digital realm. The students express a sense of nostalgia for moments of respite in the corridors and encounters that typically unfold in the physical classroom, extending into other dimensions of sociality and affectivity. As articulated by Varisco (2002, p. 96), they find it difficult to build “a community of which the student becomes a conscious and legitimate member, through an increased identity (of the ‘I’ through the ‘we’) that gives him social awareness, a sense of responsibility, a spirit of initiative, critical capacity, a spirit of solidarity.”

### 2.2 The role of feedback

Students acknowledge that feedback, in the screen-mediated environment, serves as both a cognitive and social facilitator.

The majority of students stated that thanks to the educational ecosystem implemented and the used tools, the experience of feedback was absolutely positive, as one can infer from Chart 1.

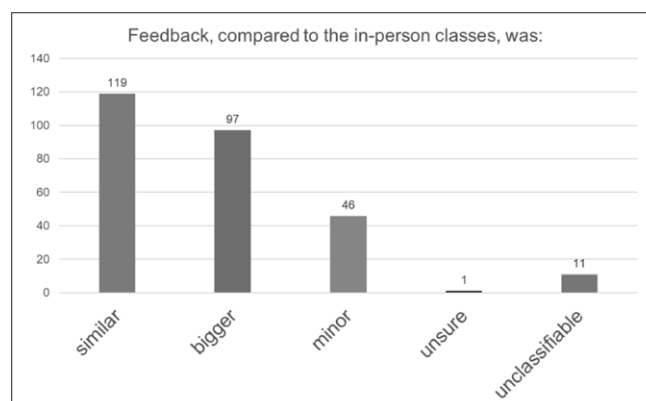


Chart 1. Comparison between in-presence and remote feedback

<sup>2</sup> The quotes taken from the students' responses from this point onward will be enclosed in double quotation marks.

The analysis of the answers highlighted that the students perceived an availability by the professor to welcome requests, to answer, to analyze doubts, underlining the importance of this being “learning centered” always careful to considering the feedback requests.

“I felt very much his attention to our doubts and opinions, showing willingness to listen to us and support us in the construction of concepts.”

The students valued the ongoing dialog facilitated through various interaction channels within the ecosystem. This support allowed for the exploration of feedback as a cyclical, dialogic, and recursive process (Laici, 2021). It transcends the professor’s simple commentary on a task or performance (Sadler, 2010), instead empowering the student toward proactive engagement aimed at improvement and self-regulation (Carless & Boud, 2018; Grion & Serbati, 2019).

“Through the various platforms, thanks to the same teacher, we could confront each other and receive during the lessons or in the day answers regarding the doubts that emerged.”

The possibility of participating and being able to ask and actively look for some feedback (Winstone & Carless, 2019) was possible for all, even for the students generally more reluctant to intervene due to shyness or other reason, and that found, for example, the synchronous chat very useful to overcome the barriers and to actively take in the virtual environment.

“Writing in chat is easier and more immediate than raising your hand in the classroom and taking the floor.”

Having designed times, spaces, and resources to make different types of feedback be experimented and enabling the students to interact even among them was an element that was particularly appreciated by the students.

“The feedback with the teacher was greater and more recursive because there was more interaction with more repartee from many of us with turn-taking. I saw this difference for me positive in almost every class, both between me and the lecturer, with other students and the lecturer, and between us students. In addition, discussions and feedback were expressed at additional times or simultaneously on the chats as well. In my opinion, it was much more immediate to talk to the lecturer thanks to technology, which is often unlikely during class and is done less because of the confusion given the multitude of in-person relationships, which involve more sensory channels and more limited time with the lecturer. Throw in the shyness of some people to expose themselves if they are seen.”

Obviously, there are also critical voices, though a minority, among those who considered feedback as inferior in comparison to that they would have experimented in presence (nr. 46). These are mainly linked to the lack of direct contact and the nonverbal interaction which could affect the professor’s possibility to understand if the students are aligned or not, to the lack of being together in moments that go beyond lesson time, to the difficulty in creating empathy. In addition, we signal the technical problems and digital divide ones on which a specific deepening would necessary that we are not developing in here.

“His work [the professor’s] was strenuous, he had to try to understand all of us, our needs, through a screen and it is not at all easy. Because there is no eye contact. There is the lack of the exchange enabled by the body. The ‘magic’ of being together lacks, of meeting to know each other better through gestures or facial expressions, which helps to understand, most of all in the practice, the performance of the lesson, the degree of interest, the emotional state that means much in relation to choices, to DESIGNING in action.”

As far as the social and interactive dimension of feedback is concerned, which is able to build the relationship both with the professor and with the colleagues, this is positively perceived by the students as one can infer from Charts 2 and 3.

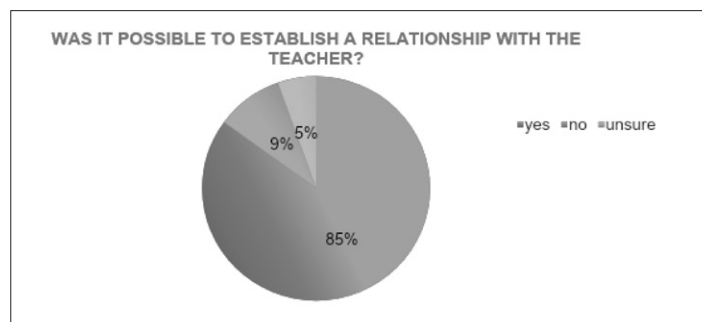


Chart 2. Relationship with teachers

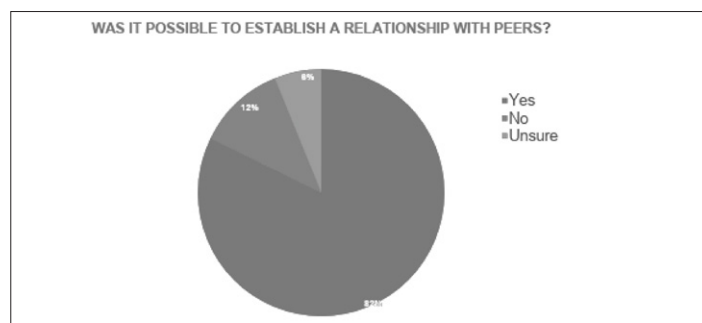


Chart 3. Relationship with peers

A feedback-centered environment enabled the majority of the students to establish a relationship with the professor and, in this sense, the importance of the professor's undertaking a dialogic attitude is considered essential by the students. "His care in wanting to create a relationship," "his being a tutor who accompanies and creates a learning community."

The students' reflections are not limited though to signaling the support to a specific one-to-one relationship, but they stretch to building useful relationships to support the whole learning community, enabling us to rethink the importance of the professor's presence in those environments and to its declination in the cognitive, social, and facilitatory presence (Rapanta et al., 2020).

The importance of a multimodal environment enabling all to find a space of exchange and discussion is underlined and stated, also thanks to a multi-channel possibility experiment through the different tools that had been used, enabling participation in different moments, also beyond the lesson time.

Finally, the students highlighted the importance of the possibility offered them to actively take part in the lessons here. A time-space for interaction was foreseen and that enabled them to progressively undertake a more and more participative attitude in the relationship with the professor, in the activities carried out along the path, and in asking and looking for some feedback. This aspect is an essential element in promoting the students' awareness related to the meaning of feedback itself, as well as in promoting that self-regulation and improvement path that feedback should ease as a general attitude by the students, not only aimed to the management of a specific immediate task, but progressively accustoming the students to perform evaluations and self-evaluation along time. This means using feedback in the trajectory of learning development, even under a long-term perspective, bringing the students to reflect, to act, to self-regulate, in an always more autonomous way even beyond their university path (Carless & Winstone, 2020; Grion & Serbati, 2019; Laici, 2021).

### *2.3 Co-designing the ecosystem*

An environment centered on feedback facilitated the establishment of relationships between the majority of students and their peers. The students emphasized their interactions to address organizational and didactic matters, initially using the tools available in the ecosystem and later transitioning to WhatsApp. This platform was chosen as a means of peer communication, allowing them to take ownership of available resources and adapt them according to their needs.

In this way, students have contributed to the co-design of the ecosystem, carving out a space for themselves that is more immediate and familiar, primarily dedicated to social interaction.

From the analysis of the answers, it is actually difficult to clearly separate the organizational and didactic aspects from the social and emotional ones. As a matter of fact, it comes out that there are constant intertwinements between the personal or private interactions among students devoted to the emotional support and the mutual encouragement and with those more linked to the collaborative and interactive dimension of the lesson, the group works.

"I and 7 other girls created a WhatsApp group for academic and emotional support. We cheer each other on since we're all working, moms, and pursuing our second or third degree."

We can talk about peer feedback, but it was more oriented to the exchange, to the reflection and mutual help starting from the didactic activities, but it stretched to a support that is also emotional and social in a moment when relationships in presence were made difficult due to pandemic, therefore offering a space-time where it was possible also to share anxieties, worries, and to offer oneself as a support for the others to support one another mutually.

"It allowed me to delve deeper and build relationships with new people. For example, for the Activity, I collaborated with three other girls I didn't know. We stayed in touch through Skype and WhatsApp, not just for organizational and teaching issues but also for emotional support, like pre and post-exam feelings."

It seems it has come out that the students grasped the ecosystem as meaningful for their path not only at a cognitive level, but also in relation to the inter and intrapersonal abilities of socio-emotional type, which are important for the personal development.

"I had the possibility of meeting new people who probably I'd have never met in presence, with them during the development of the didactic class activities we established a relationship that goes beyond professionalism and that involves the emotional and social spheres too, this experience enabled me to create new friendships that I hope will last along my university path and also beyond it."

## **Conclusions**

The study at hand may have limitations concerning the non-representative nature of the sample used. Furthermore, it specifically involves students in pedagogy and didactics, so the results may not be generalizable to different disciplinary and geographic contexts. Finally, by focusing solely on perceptions, the study might lack objective behavioral data that could provide a more comprehensive understanding of actual teaching dynamics.

The first conclusions we may infer are related to the following dimensions.

The first aspect concerns the importance of a design oriented to set up educational ecosystems supporting a cooperative learning and that are coherent with some feedback leaning-centered approach. They are hybrid environments that go beyond a mere "horizontal" blended, that is, as an alternation of interactions and activities that can be carried out either in presence or online, but toward a blended or a "vertical" type, where there is some synchrony between analogic and digital

and where the latter gets into the classroom and in the training and educational places in presence to open new spaces and new times for activities, debates, sharing and, therefore, to experiment different ways and occasions of feedback, which continue even outside the space and the time of a lesson (Pentucci & Laici, 2020).

In the analyzed experience, the environment designed as an ecosystem not only enabled various “species,” including both humans and digital elements, to interact, but also to transform the ecosystem itself. This emphasized and activated the generative potential inherent in the ecosystem, facilitating the generation of exchanges, interactions, feedback, and the incorporation of new tools selected based on both educational and relational needs.

The second aspect concerns the pivotal role of the promotion of activities – even micro-ones – to make feedback a recursive and multi-channel process and also a sustainable one in crowded classes. Changing the didactic and evaluation practices necessarily requires time, but it is important to start thinking also to a meaningful adjustment, simple versatile activities, which could also be used in hybrid contexts, that do not require much time and that could direct the change toward a new feedback culture. We considered the design of the recursiveness of the activities, enabling us to engage in ongoing feedback processes, aligning with Carless’ (2019) conceptualization of the feedback loop.

The third aspect pertains to the promotion of Feedback Literacy. In this experience, we have initiated work on enhancing the Feedback Literacy of both students and professors. This aspect, still requiring further research, entails students understanding the nature of feedback, attributing meaning to it, and managing it from a relational standpoint. In addition, students are encouraged to make productive use of feedback, focusing on improvement and self-regulation (Carless & Boud, 2018). For professors, this involves drawing upon their knowledge, expertise, and attitudes to design feedback that nurtures students’ Feedback Literacy. This process encompasses action on dimensions such as design, relational aspects, and pragmatics (Carless & Winstone, 2020).

An area that requires continued research is the promotion of a culture that advocates the establishment of feedback, training, education, and experimentation in this domain (Henderson et al., 2019; Carless, 2019). It is imperative for universities to ascribe value to feedback within policies, systems, and activities, viewing it as a practice for ongoing improvement, rather than merely as a component tied to providing grades or comments at the conclusion of a course. The institution itself should invest in the professional development of professors, foster collaboration among colleagues, even across diverse expertise, and establish workgroups dedicated to innovation, stability, and continuity in experiments and collaborations. Effective time management and optimal redistribution of workload are crucial in navigating the complexity of academic commitments (Henderson et al., 2019).

## **Authors Statement**

This paper, while being the result of intense collaboration between the two authors, has been written as follows: section 1 “Introduction and background,” section 2 “Description and methods of the survey,” and section 3.1 “Perception of the digital ecosystem as a community of practice” are by Maila Pentucci; section 3.2 “The role of feedback,” section 3.3 “Co-designing the Ecosystem,” and “Conclusions” are by Chiara Laici.

## **References**

- Bannan, B., Cook, J., & Pachler, N. (2016). Reconceptualizing design research in the age of mobile learning. *Interact. Learn. Environ.*, 24(5), 938-953. <https://doi.org/10.1080/10494820.2015.1018911>
- Carless D. (2019). Feedback loops and the longer-term: towards feedback spirals. *Assess. Eval. High. Educ.*, 44(5), 705-714. <http://dx.doi.org/10.1080/02602938.2018.1531108>
- Carless, D. (2020). From teacher transmission of information to student feedback literacy: Activating the learner role in feedback processes. *Act. Learn. High. Educ.* <https://doi.org/10.1177/1469787420945845>.
- Carless, D. & Boud, D. (2018). The development of student feedback literacy: enabling uptake of feedback. *Assess. Eval. High. Educ.*, 43(8), 1315-1325. <http://dx.doi.org/10.1080/02602938.2018.1463354>
- Carless, D. & Winstone, N. (2020). Teacher feedback literacy and its interplay with student feedback literacy. *Teach. High. Educ.*, 1-14. <http://dx.doi.org/10.1080/13562517.2020.1782372>
- Carrillo, C., & Flores, M. A. (2020). COVID-19 and teacher education: a literature review of online teaching and learning practices. *Eur. J. Teach. Educ.*, 43(4), 466-487. <http://dx.doi.org/10.1080/02619768.2020.1821184>
- Cecconi L., Sannicandro K., Bellini C. (2019). La percezione degli studenti nella valutazione dei corsi universitari erogati in modalità blended. *Italian Journal of Educational Technology*, 27(3), 207-226.
- Collins, C. (2008). Looking to the future: Higher education in the Metaverse. *EDUCAUSE Review*, 43(5), 51-63.
- Damasio, A.R. (2000). *Emozione e coscienza*. Adelphi.
- Ferrari S., Piccardi L. (2010). Studiare la CMC: i forum di discussione. In P.C. Rivoltella, A. Cattaneo (Eds.), *Tecnologie, formazione, professioni. Idee e tecniche per l'innovazione* (pp. 185-204). UNICOPLI.

- Fishman, B.J., & Dede, C. (2016). Teaching and Technology: New Tools for New Times. In D.H. Gitomer, & C.A. Bell (Eds), *Handbook of research on teaching* (pp. 1269-1334). Routledge.
- Goodyear, P. (2020). Design and co-configuration for hybrid learning: Theorising the practices of learning space design. *Br. J. Educ. Technol.*, 51(4), 1045-1060. <http://dx.doi.org/10.1111/bjet.12925>
- Grion, V. & Serbati, A. (2019). *Valutazione sostenibile e feedback nei contesti universitari. Prospettive emergenti, ricerche e pratiche*. Pensa Multimedia.
- Head, J.T., Lockee, B.B. & Oliver, K.M. (2002). Method, Media, and Mode: Clarifying the Discussion of Distance Education Effectiveness. *Q. Rev. Distance Educ.*, 3(3), 261-275.
- Henderson, M., Phillips, M., Ryan, T., Boud, D., Dawson, P., Molloy, E., & Mahoney, P. (2019). Conditions that enable effective feedback. *Higher Education Research & Development*, 38(7), 1401-1416.
- Jeladze, E., Pata, K., & Quaiocoe, J.S. (2017). Factors Determining Digital Learning Ecosystem Smartness in Schools. *IxD&A*, 35, 32-55.
- Laici C., (2021) *Il feedback come pratica trasformativa nella didattica universitaria*, FrancoAngeli.
- Lo Presti, F. (2016). La funzione della corporeità nello sviluppo della conoscenza. *Formazione & insegnamento*, 14(1 Suppl.), 55-64.
- Nicol, D. (2018). *Unlocking generative feedback through peer reviewing*. In V. Grion & A. Serbati (eds.), *Assessment of learning or assessment for learning? Towards a culture of sustainable assessment in higher education* (pp. 47-59). Pensa Multimedia.
- Pentucci, M. (2021) La didattica universitaria e la sfida posta da una nuova concezione di conoscenza, in Laici C., *Il feedback come pratica trasformativa nella didattica universitaria*, pp-15-28. FrancoAngeli.
- Pentucci M. & Laici C., (2020). An integrated blended learning ecosystem for the development of the design skills of teachers-to-be. In *ICERI2020 Proceedings* (pp. 2145-2154). <http://dx.doi.org/10.21125/iceri.2020.0516>
- Rapanta, C., Botturi, L., Goodyear, P., Guàrdia, L., & Koole, M. (2020). Online University Teaching During and After the Covid-19 Crisis: Refocusing Teacher Presence and Learning Activity. *Postdigit Sci Educ*, 2, 923–945. <https://doi.org/10.1007/s42438-020-00155-y>
- Rivoltella P.C. (2021) *Apprendere a distanza. Teorie e metodi*. Raffaello Cortina Editore.
- Rossi, P.G. & Pentucci, M. (2021). *Progettazione come azione simulata. Didattica dei processi e degli eco-sistemi*. FrancoAngeli.
- Sadler, R. (2010). Beyond feedback: developing student capability in complex appraisal. *Assess. Eval. High. Educ.*, 35(5), 535-550. <http://dx.doi.org/10.1080/02602930903541015>
- Uden, L., Wangsa, I. T., & Damiani, E. (2007). The future of E-learning: E-learning ecosystem. In *Proceedings of 2007 Inaugural IEEE-IES Digital EcoSystems and Technologies Conference* (pp. 113-117). IEEE.
- Väljataga, T., Poom-Valickis, K., Rumma, K., & Aus, K. (2020). Transforming Higher Education Learning Ecosystem: Teachers' Perspective. *Interaction Design and Architecture(s). Journal-IxD&A*, 46, 47-69.
- Varisco, B.M. (2002). *Costruttivismo socio-culturale. Genesi filosofiche, sviluppi psico-pedagogici, applicazioni didattiche*. Carocci.
- Vinatier I. (2013). *Le travail de l'enseignant. Une approche par la didactique professionnelle*. De Boeck.
- Winstone, N. & Carless, D. (2019). *Designing Effective Feedback Processes in Higher Education. A Learning-Focused Approach*. Routledge.