Teacher training in education and technology: can the pandemic be considered an opportunity?

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Abstract. When the Covid-19 pandemic challenged academic continuity, teacher training became one of the pillars to sustain educational processes in universities. Through an educational design-based research, this paper aims to characterize a comprehensive teacher training plan which addressed remote teaching between 2020-2022. This plan consisted of 38 complementary workshops which were organized around three focuses: 1) planning remote teaching activity, 2) implementing online teaching and 3) teacher autonomy in the management of technological resources. The plan enabled training in these competencies while promoting the exchange of experiences and knowledge among 1,433 teachers. It sought to generate learning based on their previous knowledge and practices and to promote situated actions based on pedagogical theories on good university teaching practices. Within this framework, the faculty developed 428 productions such as remote class plannings, learning assessment activities, teaching materials, and the design of educational programmes for virtual environments, among others. This training strategy sustained over time, based on exchange, reflection and work with situated teaching practices, strengthens the construction of academic communities.

Palabras clave: teacher training, higher education, health, e-learning, COVID-19

1 Introduction and Theoretical Framework

The forced virtualisation imposed by the Covid-19 pandemic challenged the academic continuity of universities. Between 2020 and 2022, teacher training became a pillar for sustaining teaching processes. It became paramount we ask ourselves: how can training programmes accompany and be useful to faculty's practices, in a context that requires special flexibility? How can we ensure they aren't instrumental but have a comprehensive design that addresses the integral process of teaching online? (Rapanta et al., 2020; Schwartzman, Berk & Reboiras, 2021). How can we take advantage of this historic opportunity to encourage academic communities to reflect systematically, critically and with theoretical foundations on university teaching? (Domingo & Anijovich, 2017; Adell, Castañeda & Esteve, 2018).

Teaching is a didactic process in which teachers mediate between students and knowledge through an interpersonal encounter. It considers the actual starting conditions of students in the design of teaching strategies that will enable students to access the educational goals (Contreras Domingo, 1990). To this effect, prior to any given lecture, a definition of what will be taught and which is the best way to teach it needs to take place. As this also applies to teacher training actions, this study explores both the characteristics and the content of teacher training workshops.

2 Methods

This study aims to characterize teacher training programmes on remote teaching. It is an educational design-based research (DBR) (de Benito Crosetti & Salinas Ibáñez, 2016) that intervenes in a comprehensive teacher training plan. This plan was implemented over a period of three years in an argentinean university institute in the health sciences field. It consisted of 38 complementary workshops which were organized around three major lines of work described below (Schwartzman, Berk, Reboiras, 2021):

1) **Planning remote teaching activity**: addresses processes that are frequently "naturalized" in on-site teaching and need to be reviewed when teaching remotely. This includes: a) the criteria for selecting and virtualizing content; b) the design of learning activities appropriate to this teaching modality; c) the remote assessment of learning.
2) **Implementing online teaching:** requires the development of specific competences fitting to this modality. An integral approach to this training recognizes the importance of: a) the teacher's role, b) the pedagogical bond between teacher and students and students among each other, c) planning teaching interventions considering the digital space in which these interventions will take place.
3) **Teacher autonomy in the management of technological resources:** entails not only instrumenting teachers in the development of their academic activity on the university's virtual campus, but also considering the importance of a genuine inclusion of technologies (Maggio, 2012). Teachers need to intervene in the configuration of digital tools with pedagogical criteria that supports their proper use and the construction of educational digital territories (Tarasow and Schwartzman, 2014).

3 Results

This DBR study, focusses on characterizing teacher training actions developed in the comprehensive plan as described below.

a- Modularity: independent workshops without a fixed sequence. This allowed teachers to choose according to interests and needs, building their own training paths and receiving **micro-certifications** for each activity. This aimed to encourage continuous training and accompany teaching practices in a context of high demand.

As these teachers belong to the health sciences field, in addition to being forced to virtualise their teaching activity, our recipients had to simultaneously provide healthcare in an over demanding epidemiological context.

b- Elective course modality: the *introductory modality* consisted of synchronous meetings that offered conceptual frameworks to reflect on teaching practices, with small group activities and documentation of conclusions in collaborative digital tools, exemplifying genuine uses of technologies. The *complete modality* added asynchronous activity with guided personal productions. It sought to promote **situated and grounded actions** by: accessing theoretical materials, reviewing one's own teaching practice and its redesign.

c- Personalized tutoring: a training team accompanied each participant's personal production guiding and providing constructive feedback to facilitate the implementation of the designed proposals.

d- Modeling of good practices: each workshop was designed using didactic models based on teaching and learning principles consistent with the competences to be developed. In other words, they were designed considering the same pedagogical criteria addressed. These decisions were also made explicit through analysis and reflection with participating faculty.

Looking at the results of this comprehensive training strategy, we observe that faculty developed 428 productions within the c*omplete course modality*. Among these productions we find 97 valuable remote lesson plans for the learning objectives and contents of their subjects. Participants designed 122 remote learning assessments from a perspective that understands assessment as part of the didactic process, encouraging students to become aware of their learning process and teachers to interpret what these constructions mean for teaching (Schwartzman et al, 2021). They developed 53 digital teaching materials facilitating content understanding through hypermedia paths. They built 107 virtual teaching environments to generate powerful educational experiences. This meant configuring tools and resources available on the institution's virtual campus to present teaching materials and activities through paths that favor learning. Finally, they carried out 49 curricular and micro-curricular planning tasks, analyzing content specificity and the corresponding adjustments needed for teaching them in this context.

4 Discussion

Between 2020-2022, the teacher training plan promoted the exchange of experiences and knowledge between 1433 teachers. It provided pedagogical knowledge and digital tools for a meaningful and appropriate use in everyday teaching practices that will transcend the state of emergency of the COVID context.

Two new challenges arise: transfering all that has been learned to changing educational contexts and complementing this approach with new research to analyze the extent in which teacher training is transferred and favors students' learning processes.

5. Conclusions

The characteristics of this comprehensive teacher training plan promoted the construction of knowledge in genuine situations where theory was used as a tool for reflecting, questioning and modifying one's own practice. The modularity and modality of the workshops favored the identification of teachers' challenges when teaching their disciplines. At the same time, a comprehensive view of online educational processes was fostered, encouraging the genuine inclusion of technologies. Good practices were generated by reflecting together on the unique opportunities that the context offered for the development of their teaching practice.

This study allows us to sustain the value of continuous teacher training and recognize to what extent faculty's learning on remote teaching is useful for their post-pandemic activity where hybrid teaching emerges as a dominant modality in many universities.

We believe that a training strategy sustained over time, based on exchange, reflection and work with situated teaching practices, strengthens the construction of academic communities.

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