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articoli

Building cases for faculty development in e-learning: a design-based approach

Costruire casi per lo sviluppo professionale degli accademici sull'e-learning: un approccio basato sul progetto

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Abstract

This paper presents an integrated program of faculty development on e-learning, promoted by the University of Florence since 2016. It focuses on a specific pedagogical component of the program, i.e. case studies, and on the three-phase process of design, development and testing adopted to implement them. In the first phase exemplary cases were identified to develop a design format. The second phase aimed at checking this format against the best-performers' narratives of practice, and at designing the digital resource presenting the case. The third phase included user tests and an analysis of how professional learning was shaped in novices of e-learning. Through this process, the main elements influencing effective design and implementation of case studies for professional development on e-learning in the higher education were discovered.

Keywords: faculty development; case study; Interaction Design; e-learning; higher education.

Abstract

Questo articolo presenta un programma integrato di sviluppo professionale sull'e-learning, promosso dall'Università di Firenze dal 2016. Si focalizza su una specifica componente pedagogica, vale a dire sui casi di studio, e sul processo di progettazione, sviluppo e test delle tre fasi adottate per realizzarli. Nella prima fase sono stati identificati casi esemplari per sviluppare un formato di progettazione. La seconda fase mirava a verificare questo formato rispetto alle narrazioni dei best-performers e a progettare le risorse digitali che presentano il caso. La terza fase comprendeva i test dell'utente e l'analisi di come l'apprendimento professionale fosse modellato nei novizi dell'e-learning. Attraverso questo processo, sono stati scoperti i principali elementi di efficacia per la progettazione e implementazione di case study per lo sviluppo professionale sull'e-learning in ambito universitario.

Parole chiave: sviluppo professionale della docenza accademica; studio di caso; Interaction Design; e-learning; università.

1. Introduction

We are living through a period of great change in the way we work and live in academia. With digital technologies and media increasingly permeating all sectors of our lives, even the Higher Education landscape is undergoing significant transformations of traditional practices of accessing and sharing knowledge (Manca & Ranieri, 2017; Weller, 2011). According to a recent report from the U.S., despite the overall rate of higher education enrolment going down, the online education sector is holding and even growing with more than 6 million students opting for distance education in Fall 2015 (Allen & Seaman, 2017). In Europe, the majority of academic institutions have undertaken e-learning initiatives (Gaebel, Kupriyanova, Morais & Colucci, 2014): 91% of higher education institutions are providing courses in blended mode, while 82% are offering courses entirely online. This trend seems to be destined to rise with universities needing to increase and improve their online offer (Mohr & Shelton, 2017).

As the context of higher education evolves, university teachers need to improve their teaching skills and practices including digital skills to support innovative learning processes (Kukulska-Hulme, 2012). Today, faculty professional development is a major focus for higher education institutions that want to keep up with the pace (Beach, Sorcinelli, Austin & Rivard, 2016; Meyer, 2014; Schmidt, Tschida & Hodge, 2016), and providing faculty members with effective professional development opportunities has become crucial. Although in their extensive review Amundsen and Wilson (2012) concluded that the right questions addressing design and implementation of faculty development have not been posed yet, there is evidence that successful development programs combine different teaching methods ranging from experiential learning to peer mentoring and coaching, and formative feedback (Steinert et al., 2016). Furthermore, effective programs usually offer opportunities to build upon previous learning activities and leverage on methods which emphasize problem-based approaches and experiential learning (Meyer, 2014).

This paper presents and analyzes a three-phase process of design, development and testing of 8 case studies supporting faculty members' improvement of online teaching skills in higher education. The cases have been developed in the wider context of DIDe-L ("Didattica in e-learning", Pedagogical methods for e-learning), a multi-layered program of faculty development for e-learning, promoted by the University of Florence since 2016. In the following, we first introduce the use of cases as a method for professional learning, then we will describe the design process of the cases within DIDe-L and the results of the testing. We conclude with a discussion of elements influencing effective design and implementation of case studies for professional development.

2. Background: Case studies for professional learning

What is a case? Leenders, Mauffette-Leenders and Erskine (2001, p. 2) define a case study as a "description of an actual situation, commonly involving a decision, a challenge, an opportunity, a problem or an issue faced by a person or persons in an organization". Cases are used for teaching in order to stimulate learners' critical thinking: in fact, showing professional thinking encourages learners to use theoretical knowledge to solve practical problems (Popil, 2011). Usually cases are based on real life situations, include data and documents to be analyzed and present an open-ended problem to be solved. Of course, they can be proposed individually or in groups, but they are often discussed in groups since comparing multiple perspectives may enrich problem understanding and facilitate the

solution. Literature on case studies highlights several benefits of cases for learning (Kunselman & Johnson, 2004): for example, providing an opportunity to reflect on specific subject-field dilemmas; offering expert models of professional thinking on real life scenarios; and improving learners' strategies for problem finding/problem solving. However, there are also limitations which require accurate choices from designers such as a limited focus on a too specific topic or problem, incorporated author biases, and the time required to develop meaningful cases (Yadav et al., 2007).

Case studies have been widely used in teacher education (Schrittesser, 2014), faculty development (Dunne & Brooks, 2004) and higher education (Herreid, 2011) in recent decades. Looking at faculty development, several advantages are reported in the literature (Wilkerson & Boehrer, 1992). Firstly, it has been underlined that cases encourage the exploration of teaching as a contextualized process rather than as an abstract set of skills. Secondly, when reflecting on the teaching case, especially if the analysis is accompanied by a discussion with colleagues, faculty members have the opportunity to compare multiple views and understandings. Thirdly, in an attempt to find a solution to the problems presented, "faculty members may be stimulated to learn more about the conceptual structures and tactical issues of teaching" (Wilkerson & Boehrer, 1992, p. 254). Moreover, showing a case for faculty development may serve as a model for an active approach to teaching and learning.

Since good cases are motivating, they may prompt university teachers to reflect on teaching practices and to find innovative ways to approach traditional problems, particularly referring to issues that usually raise teachers' resistance such as the adoption of technologies for lecturing. For example, in a faculty development intervention on mobile learning at the Open University, case studies were found by participants as one of the best methods to approach new pedagogical practices (Kukulska-Hulme, 2012).

Recently with the spreading of digital technologies, cases are commonly used for teaching in a virtual learning environment (Bayram, 2012; Mohr & Shelton, 2017). Similarly to text-based cases, web-based cases allow learners to explore professional problems through the analysis of real teaching tasks, and support the transfer of learning from theory to practice and the construction of new meaning.

3. DIDe-L: a multi-layered approach for faculty development on e-learning

DIDe-L project introduced a multi-layered approach aimed at promoting faculty development on e-learning within an institutional framework supporting innovation in teaching practices and learning. It was envisaged as multi-layered for it sets a number of educational activities corresponding to different theoretical levels of professional learning, that is: Individual, Community and Social (Ranieri, Pezzati & Raffaghelli, 2017). The connected activities were: labs for the development of technical skills, environment and multimedia resources for self-learning, coaching, specific subject field case studies, seminars and professional learning communities. Figure 1 shows these combined sets of components.

In this article we will focus on case studies as one of the method adopted in DIDe-L for scholarly professional learning. We will analyze the three phases of design, as a cyclical and recursive process of problem solving, solution development and testing of the design's outcomes.

Theoretical Level	Description and pedagogical assumptions	Professional Learning activities
Individual (Direct instruction and practice)	**Assumption:** direct instruction and guided practice are still a primary form of addressing professional training needs, at a level of "knowing and understanding". **Learning outcome:** general and specific knowledge related to e-learning as a first step for professional development.	**Coaching and technical labs** Guidance and support on pedagogy and technology through face-to-face seminars and individual sessions to advise scholars on the instructional design of their virtual learning classes, and on-site labs on the features of the platform.
Individual (Self-Regulated Learning)	**Assumption:** the possibility of self-managing the rhythm of the learning process and accessing examples and tools to implement knowledge and develop skills is of crucial importance for adult learners. **Learning outcome:** specific knowledge and appropriate abilities to apply and translate methodological knowledge into innovative practices of teaching.	**Multimedia resources for self-learning** Online contents on the different types of e-learning models with explanations and suggestions on content delivery (when planned), design of online activities, management of communication and strategies of evaluation; templates on how to shape the virtual learning space are also provided.
Individual (Problem-based Learning)	**Assumption:** to improve practice towards expertise, it is necessary to transfer methodological knowledge and skills to new situations that encompass reflection on challenges and solutions' development related to the specific domain. **Learning outcomes:** critical, meaningful and reflective knowledge with increased capacity to use and apply knowledge and skills in the specific disciplinary context.	**Specific-subject field case studies** A number of cases focusing on specific-subject related teaching challenges which faculties usually face in the different disciplinary fields. The case is reported highlighting problems and solutions, but also engaging users in problem solving processes.
Community (Networked Learning)	**Assumption:** Once individuals develop their own practices, the sharing of them within a community of peers enhances learning processes based on participation and forms of conversation leading to deeper reflection and improved practices. **Learning outcomes:** emotional to intellectual aspects with positive implications for motivation, development of professional identity and innovation of teaching practices.	**Professional learning communities:** Community build-up through shared cases in a show-case database providing not only access to innovative practices but also resources (materials, tools and contents developed).
Social (Organizational Learning & Development)	**Assumption:** Participation in a broader network to disseminate, communicate and share practices encompasses benefits for the individual in the context of a process of organizational development. **Learning outcomes:** expanded scholars' professional network and enriched pedagogical practices with benefits for satisfaction, reputation and professional practice; innovation and quality in teaching as part of an organizational process.	**Institutional Events and Dissemination:** Entrenched with the community level, DIDe-L will set up institutional and national events to promote debate on eLearning in Higher Education based on DIDe-L's outcomes voiced by the participants[1].

Figure 1. DIDe-L's Multi-layered approach.

[1] For example, a conference on Digital scholarship was organized in Florence on 5th October, 2017 and scholars involved in DIDe-L shared their innovative practices of e-learning through Moodle. The proceedings of the conference are in preparation (Federighi, Ranieri & Bandini (eds.), in press).

4. Method

The leading questions of the whole process of design and development of the case studies were: Given the relevance of case studies for professional learning, which are the most effective approaches to design and implement them in the context of higher education?

The method adopted to answer this question was typical of interaction design studies applied to learning design (Mor & Winters, 2007), already used by the authors for the development of other DIDe-L digital components (Ranieri, Raffaghelli & Pezzati, 2018). In a first loop of design, theoretical and factual pedagogical information guide designers. A following loop takes designers to interact with the users gathering information about the design assumptions and to reformulate the design hypothesis. Successive loops encompass alpha user-testing, corrections and beta-test release.

In our case, the first phase/loop aimed at searching for exemplary cases to reflect on to lay the basis for designing. Since it was theory-driven, the criteria adopted to identify the best-performers were based on an ideal scenario of practice encompassing specific knowledge and skills. The second phase/loop aimed at checking this structure against the best-performers' narratives of practice, encompassing two main steps. Firstly, a thematic analysis and categorization of narratives to build a renewed professional learning scenario and, second, the learning design process of the digital resource presenting the case. The third phase/loop included initial user tests of the digital resources above and analysis of how professional learning was shaped in novices of eLearning.

As in many design studies (Maina, Craft & Mor, 2015), each phase embeds all the research elements, i.e. instruments, participants and results. Therefore, in the next paragraph we introduce the three phases including all the elements of the design-cycle.

5. Results: the three phases (loops) of design

5.1. The first phase

The initial phase of design could be considered the "ground-zero". As learning designers, the ill-defined problem had to be framed in order to trigger the development of effective resources for learning. Therefore, this loop included the strategies of selection of best practices and the initial interviews with 3 academic teachers leading to identify a design format to structure cases. This phase was theory-driven. Moving from research in the e-learning field, best practices were identified as those that would show effective use of technologies to promote students' engagement, participation and learning; namely, wrap-up and collaborative methodologies, according to Mason (2002) and Ranieri (2005). However, given that unfeasible models of expertise do not gear effective professional learning (Webster-Wright, 2009), the authors decided to select cases within the institution as achievable examples of practice for other colleagues to follow. Therefore, the selection of best practices was based on an initial monitoring of the platform according to automatized criteria related to the type of e-learning courses implemented by the academic teachers. An interface to extract information from the LMS Moodle was created and applied through simple queries (Catelani et al., 2017): courses with fewer modules/activities (particularly no active online forums) and only textual resources (PDF, Word, PPT) were considered as proxy for low techno-pedagogical skills; courses with more modules devoted to interactions with students (assignments, forum, glossaries, databases) and simple resources were considered as a proxy for medium techno-pedagogical skills; and courses

with the adoption of all sorts of modules, interactive resources and refined assessment strategies as a proxy for advanced or highly advanced techno-pedagogical skills. Nearly 200 courses were extracted by July 2016 and hence monitored applying even the criterion of the class sizes against the number of records registered within the course. A high ratio class-size/number of records would encompass high levels of student engagement, while a low ratio would lead to discard even the most sophisticated type of course for not having any impact on students. 10 cases were finally identified. While they were generally exceptional forms of adoption of the LMS, it was impossible to make any assumption on the pedagogical knowledge and the educational problems these academic teachers faced to design learning the way they did. Therefore, prior to inviting them to become part of the staff developing the cases, it was decided to develop a design format guiding academic teachers in the explanation of their pedagogical and methodological choices in a narrative way. This format was developed through interviews addressing a smaller group of academic teachers covering a limited spectrum of scientific areas (Humanities, Education) and including 3 participants, all female aged 45-60, whose expertise ranged from Advanced to High Advanced. They were interviewed in October-November 2016, via "Teleskill" (a web-conference system), over a set of general questions following the process of design thinking adopted by these successful teachers.

The questions were about (i) the general challenges of teaching in higher education; (ii) the requirements for teaching a specific subject field; (iii) the integration of e-learning in their courses and its benefits compared to the challenges and requirements; (iv) the impact of e-learning innovation on students; and (v) the impact of e-learning innovation on the academic teacher.

The initial question attempted to grasp the whole perception of the educational problem in higher education by the interviewee to contextualize the case and reflect on the effectiveness of the interviewee's solutions. However, it was hypothesized that the disciplinary area would encompass different conceptions and professional knowledge on teaching and learning; therefore, the second question framed these drivers of learning design. These questions were deemed of crucial importance not only to understand the interviewees' motivations to implement pedagogical innovations, but also to motivate other academic teachers (*the why should I learn*). The third question asked to explain the specific solutions implemented and the role of e-learning (*the what should I learn*). Questions four and five covered the relevance of the intervention asking for an evaluation (*the what happened*). The results of the initial interviews are synthesized in Figure 2.

Dimensions explored	Teacher A	Teacher B	Teacher C
Roles	Associate Professor (Tenured)	Associate Professor (Tenured)	Full Professor
Disciplines	Education	Foreign Languages	Education
Courses	Theory of Education 2nd year – First Bologna Cycle	French 2nd year – First Bologna Cycle	Artificial Intelligence and learning theories 2nd year – First Bologna Cycle
Question 1 General Challenges in HE	Large size class. Need to provide "authentic tasks" and activities that guide the achievement of technical/ professional competences crucial for a Degree in Education.	Large size class. Need to adopt environments and situations where students can interact with French in a passive and active way.	Advanced course within the Degree in Cognitive Sciences. Need to offer engaging ways to understand a topic whose relevance is misunderstood by Cognitive Sciences students.

Question 2 Specific challenges in your disciplinary area	Social pedagogy is an area requiring critical reflection. Students need to practice research methodologies and reflective educational practice.	Learning a language as an experience of exposure and practice.	Adopt IT technologies actively and creatively. Enact critical thinking.
Question 3 Educational innovations including eLearning	Resources for learning based on face-to-face activities. Introduction of "e-tivities" related to self-reflection and narrative writing as a method for educational research. Teacher's feed-back in class and through the online forum, adjusting students' reflections on the process. LMS (Moodle) Tools: File, URL, Online Forum, Assignments, Students' logs.	Online environment connected to French online dictionaries, museum environments and French digital libraries. Use of the online forum to discuss the terms and cultural aspects of Francophonie. Building a Wiki on countries of Francophonie. Teacher's feed-back in class and through online forum and wiki. LMS (Moodle) Tools: File, URL, Online Forum, Groups, Wiki	Resources for learning based on face-to-face activities (video lectures and slides). Online environment connected to external Wiki environment (adopting Wikipedia technology); social network DIIGO for social bookmarking. Use of online forum for cooperative learning (JIGZAW). Group's log and individual student's log (e-portfolio) to track reflections on the processes. LMS (Moodle) Tools: File, URL, Assignment, Groups, e-portfolio.
Question 3 Impact on Students (I) Organizational issues	It facilitated teacher's monitoring and students' feed-back. It supported the collection of reflections in a clear space reworked for further student reflection.	It facilitated guided access to a number of external quality resources. It supported discussions and writing in French as active use of language.	It triggered reflections on Artificial Intelligence also connected to the adoption of technologies for learning. It facilitated team-working and students' expression.
Impact on Students (II) Learning processes	Quality of narrative and reflective thinking. Students' satisfaction with their own learning.	Quality of written French and French comprehension. Students' engagement and participation.	High motivation and participation. Better performance at assessments than the students that had not attended the course. Higher percentage of overall passing students. Soft-skills development (communication and team-working). Digital literacy
Question 4 Impact on the teacher and her professional learning	Reflection on "what changes" in the pedagogical relationship technologically mediated. Development of digital skills.	Stimulation of curiosity towards new teaching approaches. Satisfaction after observing improved students' skills. Development of digital skills.	Analysis and reflection on the quality of teaching that led to an approach of "scholarship of teaching and learning". Re-design cycles for continuous improvement in teaching.

Figure 2. Analysis of first three cases of best practices integrating e-learning in HE.

Phase 1 led not only to selecting "best-practices" useful for case development but also to identifying meaningful dimensions to explore further cases. In fact, participants

appreciated this "exploratory talk" which brought them to reflect on implicit aspects of their teaching.

5.2. The second phase

Once the design format had been finalized, the next phase focused on two issues, i.e., the more systematic data collection as content of the cases, and the process of learning design, including the pedagogical and the technological features of the case.

As for the first issue, six new academic teachers were interviewed between January and February 2017 according to the protocol used with the former group. This new group was composed of 3 males and 3 females, aged 45-60, with advanced or highly advanced courses implemented. They came from the following disciplines: Math and sciences, Technology, Social Sciences, Education and Medicine. Every interview was video-taped and transcribed, for further discussion on the case-design. Figure 3 provides a synthesis of the teachers' answers, taking into consideration *cross-discipline* outputs and *discipline-specific* outputs.

Dimensions explored	Outputs	
Roles	4 Associate Professors (tenured) 2 Adjuncts	
Disciplines	Education, Social Sciences, Math and Sciences, Technology, Medicine	
Courses	3 cases in the 2nd year – First Bologna Cycle 2 cases in the 1st year – First Bologna Cycle 1 case in the 2nd year – Second Bologna Cycle	
Question 1 General Challenges in HE	Large size classes. Providing "authentic tasks" and simulating the scenarios of professional practice. Supporting students' study skills. Supporting a learning culture for HE and science. Feed-back and the whole relationship within the "learning community". Attracting the students' attention when the courses are not central to the professional profile.	
Question 2 Specific challenges in your disciplinary area	>Math & Sciences: More concern on the scientific culture and the problem of gender in science. >Technology: Adopting advanced technologies to learn as a means to experience technological features. >Education: The educational relationship in large size classes. Promoting more dialogue within the learning community. >Social Sciences: Simulating the scenarios of professional practice effectively. >Medicine: Introducing the idea of the medical profession as complex and multifaceted, beyond the students' perceptions and misconceptions linked to very specific professional practices.	
Question 3 Educational innovations including eLearning	**Cross-disciplinary outputs** Resources for learning preparing or supporting in-class activities. Online activities amplifying in-class processes in two directions: > Self-regulated learning to deepen a matter, exploring examples of practice or doing exercises. > Teachers' monitoring and giving group and individual feed-back.	**Discipline-specific outputs** >Math & Sciences: Online environment to share problem-solving processes and outcomes. Spaces to discuss processes and "debug". >Technology: Online environment as organizational space, connected to external platforms (simulation and feed-back on programming processes). Tasks and solutions discussed in class. >Education: Online environment in a twofold perspective. Firstly, as space to deepen concepts as well as support narrative writing and reflection. Secondly, as space to practice dialogue and collaborative thinking. >Social Sciences: Online environment as preparatory for in-class discussions. Authentic resources (cases) presented online, with discussions started in class and

	Seamless learning: in-class dialogic spaces relating the subject taught, with continuity in digital spaces within the LMS and beyond (digital libraries, social networks, simulation platforms, etc.)	concluded online with a peer-learning/feed-back approach. Assignments adopted to tailor feed-back on problem-solving from the teacher to the student. >Medicine: Online environment as preparatory for in-class exercises and discussions. Access to digital libraries and worked examples. Online quizzes to self-monitor concept comprehension. Peer-assessment of exercises.
Question 3 **Impact on Students (I)** **Organizational and learning issues**	**Cross-disciplinary outputs** Better organization of the whole learning process as a continuum between class and students' independent activity. Students' engagement. Students' satisfaction and self-efficacy. Quality of students' outputs. Improvements in learning performance (final assessments). Development of soft skills (peer collaboration, academic writing, learning to learn).	**Discipline-specific outputs** >Math & Sciences: Faster communication with the teacher and peers in the case of being blocked in specific problem-solving tasks. >Technology: As in the case of Math & Sciences + Faster achievement of specific tools to self-monitor problem-solving tasks. >Education: Visibility of the intense communication amongst peers and with the teacher, as well as of narrative writing on learning design (one of the tasks required of the students) as a means of learning to learn in the specific professional area of education. >Social Sciences: Improvement of performance in final exams, adopting key terms and specific academic/professional writing forms. More alignment between the learning process and assessment, also perceived by the students. >Medicine: Deconstructing prejudices on the adoption of specific tools informing the physician in his/her practice. Improvement of performance in final exams; soft-skills achievement through peer-assessment.
Question 4 **Impact on the teacher and her professional learning**	**Cross-disciplinary outputs** Less cognitive load while dealing with large size classes, with perceived teaching effectiveness (in modulating students' behavior). Reflection on "what changes" in the technologically-mediated, pedagogical relationship. Satisfaction after observing improved student skills. Development of pedagogical and digital skills.	**Discipline-specific outputs** >Math & Sciences: Faster communication with the students along problem-solving process; opportunity to emphasize a scientific culture without gender stereotypes. >Technology: Less cognitive load in driving students to understand technological solutions. The modelling process through simulation and automatized feed-back allowed the teacher to have an overview of learning progress for the whole class as well as for each student. >Education: Understanding a new generation of educators, their concerns, pedagogical conceptions and ideological positioning towards the School and overall process of education. >Social Sciences: By better visualizing the students' behavior (individual and collective) the teacher was able to understand the learning gaps in the disciplinary area, as connected with the contextualized professional skills. >Medicine: Satisfaction in implementing a system that spotted rather "dark areas" of knowledge for the medical profession, allowing the students to build a broader idea on what being a physician is and how the practice of medicine can be based on interdisciplinary ideas.

Figure 3. Results of the second round of interviews.

Regarding the second issue, that of designing for learning, through the process of interviewing a clear picture emerged of areas of knowledge that should be presented to the participant in order to trigger his/her motivation to learn, his/her interest in the case

specificities and technical issues, and the imagined applications to his/her own professional context of practice. In the following, we will introduce the process of storyboarding including some technical aspects.

Storyboarding & technical aspects. The storyboards were created on the basis of the transcriptions of the interviews and organized in order to provide the professional learner with an interactive solution enabling him/her to better focus on technical and methodological concepts. They were structured as follows:

- Case presentation: Context and guidance for learning along the case;
- Educational challenges: Short videos of two-three minutes each focusing on specific sequences of the challenge presentation. A synthesis of key points in the challenge was offered in a caption area;
- Proposal: Problem-based learning activity. Through short structured online quizzes, the participant is invited to make a proposal based on the educational challenge referring to: Content, Communication, Resources, Assessment and Evaluation. Formative feed-back and resources for the problem-solving process are provided;
- Solution: the protagonist introduces the pedagogical innovation adopted; his/her discourse is synthesized and divided in several labeled sequences (content development, use of the LMS, assessment technologies and strategies, etc.). A synthesis of the solution is offered in a caption area;
- Perceived Impact: the protagonist introduces the innovation impact (teacher's impact, students' impact). A synthesis of the perceived impact was offered in a caption area;
- Conclusions: a brief quiz to reflect on the e-learning methodology adopted within the solution: content & support, wrap-up, collaborative or mixed approaches;
- Final Reflections: the participant is invited to give his/her opinion on the whole case observed, in connection with his/her reflections as an academic oriented to a present and future scholarship of teaching and learning.

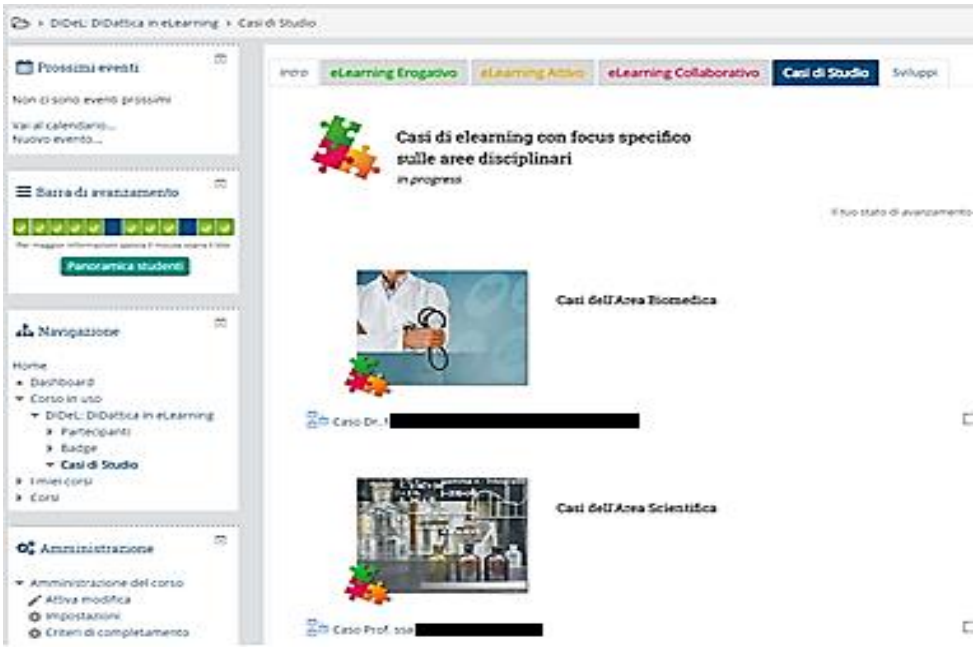

Figure 4. The several cases in the DIDe-L environment.

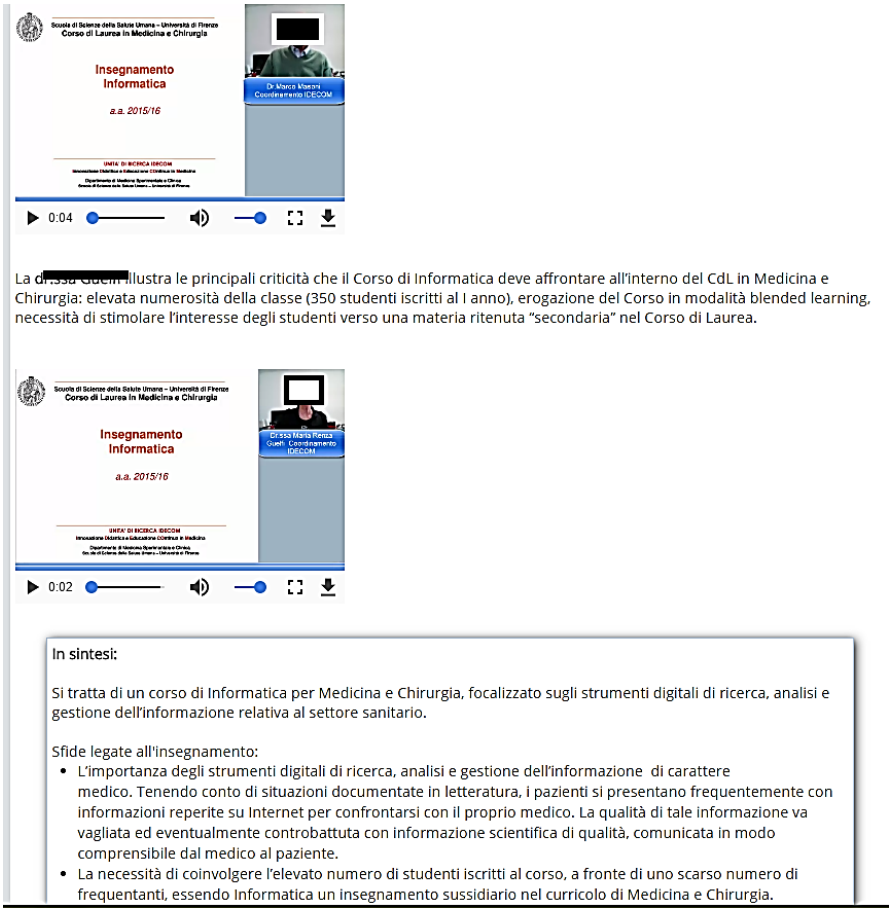

Figure 5. Case study interface: case presentation and challenges.
The picture shows the video resources and the textual synthesis.

Case studies were therefore implemented as digital resources within a multimodal, interactive and flexible format. Figures 4 and 5 show the digital interfaces introducing the elements described earlier.

5.3. The third phase

The third phase was expected to open the results of dialogic interactions with case protagonists and the final products obtained to a broader community of users within the same institution. The users identified in this phase were selected for their being novices. They were 6 PhD students, researchers and adjuncts with not more than 1 year of experience in academic teaching. They came from Engineering (1/6), Law and Political Sciences (2/6) and Education (3/6).

A questionnaire guiding user testing activities was consequently administered, covering the following issues: (i) self-evaluation of e-learning knowledge; (ii) selection of two cases and free exploration of the case study taking notes on the experience; (iii) user-experience, i.e. to what extent the resources were interesting, useful, knowledgeable; (iv) reflections on professional learning enacted by the case studies; (v) suggestions to improve the cases.

Users considered themselves as generally well informed on e-learning theories and competent (5/6). Only one case gave "no agreement" answers showing less interest.

As for the general impressions on the DIDe-L environment, the users considered it: "[…] is certainly functional on an educational level and easy to navigate […] Good overall impression, especially for format and navigation. The presence of videos is very useful" (U1); "The platform is well structured and, after a few minutes, it is easy to navigate within the DIDe-L course" (U2); "User-friendly interface, appropriate color selection, intuitive navigation, clarity of content and activities" (U3). However, they all considered the environment graphically "old-fashioned". As U2 said "The interface is typical of environments 1.0 of university e-learning platforms. This could make the experience of using the platform less enjoyable", or also U1 "the visual aspect of the environment is not in keeping with that of the most recent e-learning platforms". Hence, the younger users considered an issue that had been "invisible" for the more experienced teachers.

Users selected cases far away from their disciplines: the cases of Medicine and Linguistics triggered the curiosity of four users (4/12); the cases of engineering (2/12) and pedagogical issues (7/12) received more attention; only 1 visit was devoted to the Law case and none for the Math and Sciences' case. Regarding the user experience, the users expressed that "I appreciated how the case was structured: starting from the educational problem to reflect on the solutions. Another strong point I think is the description of the teacher's profile, because it can activate an "identification" process (with other colleagues)" (U3); "Short but effective in communicating experience. Very suitable for most of our teachers" (U5); "Excellent impression relating to how the teachers in the case used e-learning tools" (U1).

When asked about the reasons that led them to select the two cases for the user test, the participants replied: "I chose case 1 (Biomedical Area) because I was curious to see what is taught and how in this area through ICT; and the case 2 (Humanistic and Educational Sciences) I chose it because of my own area" (U1); "The first case for reasons of scientific interest compared to the academic activity I carry out; the second case for personal curiosity about the topics covered" (U3); "In the first case I was attracted by the theme, in the second I knew the author" (U4).

Finally, the participants considered the cases in the light of their own professional learning. U1 stated that overall "[…] it is necessary for all teachers to at least proceed to a progressive integration of traditional teaching methods with DIDe-L tools"; while U6 expressed that the case triggered awareness on doing "more learning needs' analysis prior to learning design" and the use of specific tools "I would like to try to introduce the recording of lessons and experiment with their use and reuse within the Moodle environment, primarily as a reflexive and self-reflexive practice". Very interesting the reflection made by U4: "The cues provided identify problems going beyond the single case of online teaching, and could be seen as deep reflections with a more general value for any type of educational activity. The concepts of autonomy and responsibility in the online environment, dealt with in the cases, are very important. The conflict between the "innovative" pedagogy offered by a teacher and the poor appreciation by the students, as well as the concept of changing the relationship between the teacher and the student are fundamental. Moreover, I appreciated the idea of pedagogical flexibility, of adopting e-learning together with the lesson that is still a fundamental piece of our educational system. The concept of the class group as an inquiry group that works in enlarged spaces and seamless time to build knowledge is the key of future educational scenarios".

Concluding this phase, the design-team synthesized the loops of learning design as a process with specific outputs in Figure 6.

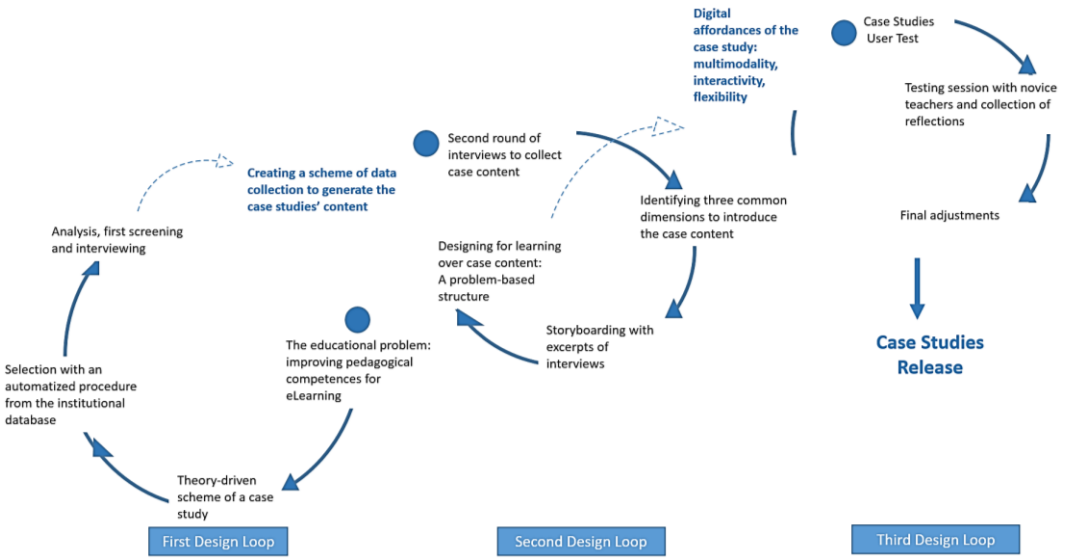

Figure 6. The DIDe-L case studies: a synthesis of the design process.

6. Discussion and conclusion

To what extent was case study an effective method of professional learning within the faculty development program DIDe-L? Although our results are limited to a small sample of teachers and comments from the user test were brief, we can answer this question from a twofold perspective, namely that of the academic teachers directly involved in the design and development cycle, and that of novice teachers who participated in the user test. As for the first point of view, the same process of building up the case structure triggered reflections on what was effective within their own teaching generating a feeling of satisfaction from participants who better reflected on their ideas of teaching. Here the case design process encouraged active learning and critical thinking (Popil, 2011), facilitating participants to reflect on their teaching and get a clear picture of areas of knowledge that should be presented to the learners in order to attract their attention, improve their motivation, increase their interest in case specificities and in possible applications.

Moving to the second point of view, that of users in the third phase, we can identify some main trends. In particular, we can observe that the initial approach is based in a polarized approach: the curiosity of an unknown disciplinary field, or a well-known field. Following our colleagues' experience seems to trigger a twofold process: the first is the analysis of specific technical issues to implement teaching through e-learning tools within one's own discipline; the second relates to teaching methods in general, across disciplines. We could further interpret this pattern to the way professional knowledge is achieved: from a reflection on specific and more practical problems and techniques, to the advanced reflection that reifies practices and produces transformation, innovation or modelling. In this regard, offering cases of several disciplines accompanies professional learning. We could therefore consider that specific cases of diversified knowledge areas are important not only to offer support to general knowledge on teaching methods applied to teachers' own fields of professional practice; but also to accomplish the "round trip" from the practical applied to the conceptual generalization. As Berliner stated (2001) "it is case knowledge that is probably the basis for positive transfer by experts in complex

environments, meaning that the ability to codify and draw on case knowledge may be the essence of adaptive or fluid expertise" (p. 477). This observation points out that the development of a "professional habitus" entails a reflective dimension strictly connected to narrative and interpretative skills (Schrittesser, 2014). Both skills were urged during case design and development to prompt and consolidate a new professional habitus in the field of technologies for teaching and learning.

The process we went through to develop cases for e-learning as well as their results also showed some limitations. Firstly, as emerged from the user test, the visual of cases was found as "old fashioned". Case developers had to deal with budget limitations which led them to mainly use Moodle features and already available open visual resources without considering smarter solutions. Of course, graphics is an important component of an e-learning provision (Bayram, 2012), especially when modelling online teaching practices, but implementing good graphics is still expensive. Secondly, the whole process of design and development confirmed to be time consuming (Yadav et al., 2007) both for developers and the academic teachers involved in the staff. Given these limitations, we recommend selecting meaningful cases in a very accurate way to provide higher educators with the best e-teaching practices for this changing digital age.

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