LEARNING ENGINEERING AND REENGINEERING FOR ONLINE AND HYBRID ENVIRONMENTS: A CASE STUDY OF A BLENDED COURSE

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Abstract

The transformative actions in education, driven by the social changes in our contemporary society, aim to adapt individuals to the new socio-economic environment. As a result, the digitalisation of adult education takes on a significant role, in response to the need for constant and less time-consuming training. How does the use of new technologies in adult education contribute to the reconfiguration of learning engineering?

The aim of this article is to examine the current transformations in education, better understand the recent developments induced by blended learning and the effects observed in adults. To do so, we conducted a case study on adult learners during the academic years 2018-2020. The experimentation consisted in transforming a face-to-face course into a blended course. The presentation and analysis of the engineering of the blended learning scenario attempts to answer the following question: How does blended learning transform the practices of accompaniment, support or coaching (Papadopoulou, 2020)? As for the analysis of the three questionnaires proposed to the students, it aims to answer the question: How does the introduction of blended courses effect the adult learners? Thus, cross-analysis of the collected data provides results about the transformations of practices caused by the integration of new technologies in adult education.

Keywords: Open and Distance Learning (ODL), Learning engineering, Blended learning, Learning scenario, Accompaniment

Introduction and research objective

Distance and blended learning were introduced in adult education under the impetus of socioeconomic changes. This context refers to an acceleration (Rosa, 2014) of the rhythms that lead to the application of existing teaching methods (those used in face-to-face

training) in online environments and practices. However, researches (Papadopoulou, 2020) have shown the importance of adapting our practices to the new digital and socio-educational environments.

Indeed, new technologies in training will always meet limits (Linard, 2001). By their nature, they encourage us to do rather than think, or even more to repeat than invent. On the contrary, adult education "consists less on doing than reflecting and less on navigating online than building paths in the real world" (p.236). Therefore, the tensions are still to be resolved. Trying to resolve these tensions requires questioning the learning engineering and in particular, the accompanying engineering used during a blended or distance training. What should we change in learning engineering in order to adapt our practices to the particularities of distance learning?

To try to answer this question, we have set up an experiment based on the transformation of a Master degree face-to-face course, into a blended course. Our research work consisted both of analysing the engineering used for the design and animation of the experimental blended scenario, and at the same time of observing, collecting and analysing the uses and effects of this pedagogical transformation on learners.

Transforming Portfolio into a blended course: the context of the case study

The experiment is based on the course "Narrative approaches and accompaniment of the experiences: the reflexive portfolio". The duration of the course is thirty-three hours, spread over four and a half days during the first semester. It consists of four phases (Breton, 2015):

54. The presentation of the approach, the formalization of the framework and the biographical feedback on the life path and/or the professional path (first session);

55. The accompaniment to the configuration of the experience in three stages: identification and explanation of significant moments and categorisation of experiences (second session);

56. Structuring of portfolio support and choice of dissemination methods (third session);

57. Presentation of portfolio approaches (fourth session).

The case study involved a group of 23 students over three years. In 2018-2019, we implemented the transformation of the course Portfolio into a blended training. A first group took advantage of the online environment, created for this purpose. However, it was only in 2019-2020 that students were able to take the blended training and produce a

reflective feedback as their experiences unfolded. The third year 2020-2021 is dedicated to the analysis of the collected data and the communication of the results. This article is part of a first communication at this stage of analysis.

The students, who are part of the experiment, are 35 to 40 years old and have several years of professional experience in various sectors. They usually undertake studies aiming a professional development or retraining. We are therefore clearly dealing with adults for whom the modalities of university education and, even more so, those of online education do not represent the usual conditions of learning. Of the two teacher-researchers who participated in the experiment, only one is qualified in distance learning practices.

Transformation of the training through the integration of new technologies

As a reminder, the objective of our study is to measure the transformations in engineering induced by the introduction of distance learning in the course Portfolio. In order to do so, we analysed the learning scenario implemented and the effects produced on the learners. Following the presentation of the context of our study, we propose here to clarify the notions of *learning scenario* and *accompanying engineering* before presenting the methodology and results of our study.

Introduction of learning scenarios in adults' training

The term of *scenario* remains hard to define, as it is sometimes linked to a lesson plan, a learning method or a teaching strategy (Dessus, 2006). For our research, by scenario, we refer to the use of an IT platform for coaching activities, learning activities (consultation of resources, remote practical work, etc.) and methods of activity organization (work phases involving presence and distance, individual and group work, forms of evaluation, etc.). We build on the "collaborative case study scenario" approach proposed by Godinet (2007), while adapting it to our context. The particularity of this scenario is "that it places a clear emphasis on the production of knowledge and skills by the learners themselves ("learning" model), rather than on the restitution of knowledge carried out under the control of the teacher" (Eneau & Simonian, 2011; p.101).

An accompanying engineering to reinvent

If our objective is to understand how the integration of new technologies in adult education transforms accompanying practices and learning engineering, we must first clarify these concepts. To do so, we draw on our previous researches in the field of distance learning, which led us to define an ingenious approach of Open and *Integrative* Distance Learning (OIDL) (Papadopoulou, 2020; forthcoming). The concept of *integrative distance* refers to a

> *"Conducive environment to raise awareness of the experiences of the learner, in order to transform them into communicable skills and knowledge but also to give meaning to his personal, professional, training, even existential process. It articulates didactic of the contents and accompaniment of the learners' experiences" (Papadopoulou, 2020; p.304).*

In other words, to transform ODL into an Open and Integrative Distance Learning (OIDL) we need to articulate the teaching of the contents and the accompaniment of learners. The accompanying engineering in an OIDL, proposed in this framework, includes four levels:

58. Institutional level – It constitutes the broadest framework. Its objective is the co-responsibility of the actors.

59. Organizational level – It corresponds to the learning engineering based on the experiential continuity of the learners.

60. Operational level – It corresponds to the accompanying engineering. It aims the accompaniment of the experiences of the learners.

61. Technological level – It invites the learner to reflect on the appropriation of the online environment through the accompaniment on the use of the tools.

A case study for the analysis of a complex phenomenon

What changes in engineering would lead to a better accompaniment of adults in blended training? To answer this research question, we used a qualitative case study approach combining:

62. ethnographic observations, in particular on the implementation and animation of the courses;

63. analysis of the learning engineering of the scenario;

64. analysis of the questionnaires answered by the learners.

The case study seems suitable for an analysis of the transformations made to the learning scenario in terms of engineering and the feedback of the students on their uses and intentions, because it allows studying a specific phenomenon in the complex context of distance learning (Yin, 1984). Immersion in the field and active listening allowed a more in-depth analysis of the students' responses to the questionnaires and highlighted sensitive and intimate points.

Methods of data collection: between experimentation and questionnaires

The Figure 1 presents the flowchart of the temporality and organization of the different steps of the study.
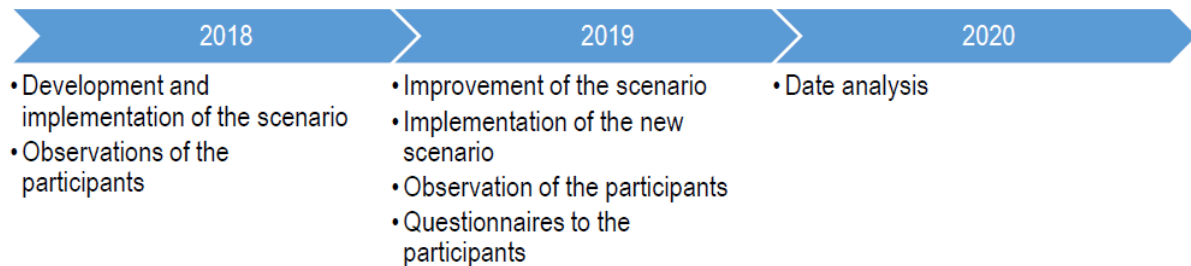

Figure 1. Phasing of the field work

We started with the transformation of the face-to-face Portfolio course into a blended course. To do so, we shot and edited six videos of a duration of five to ten minutes. In addition to these videos, we created a forum allowing distance support through the free expression of students and exchanges with trainers. Finally, other educational resources have been put on the platform, such as textual resources, to complete the theoretical contributions, to answer the questions of the students, to go further on the approach for those who wish it, and to customize the training in order to meet individual needs.

We made the hypothesis that these resources facilitate the process of creating a portfolio, by allowing a reflective feedback on the approach and a projection on the future use of the portfolio by students in the context of their professional and personal activities. A second hypothesis was that blended training would favour the experiential continuum (Dewey, 2006) of the students by articulating the theoretical contributions with the reflective work on their experiences by a hetero-accompaniment in face-to-face learning and a self-accompaniment during distance learning.

Finally, we proposed to students three questionnaires, one for each intersession. Some completed them online and some completed them at the end of the face-to-face courses. We received 25 responses in total.

Methods of data analysis

The data was analysed in two phases. First, we analysed the characteristics of the learning scenario designed and implemented during the experiment. We focused on its ability to take into account the experiences of individuals and thus to make the distance *integrative* (OIDL). Second, we analysed the questionnaires in order to obtain results in terms of the effects and transformations produced by the learners. Finally, we cross-referenced these

data in order to interpret the results of the study in terms of transformations of accompanying practices during a blended training.

The analysis of the learning scenario was based on the indicators related to the presence or absence of the *integrative distance* in the engineering of an ODL. To do so, a grid has been built, the relevance of which has been demonstrated in previous researches (Papadopoulou, forthcoming) (see Table 1). It integrates the engineering levels of OIDL. At each level, indicators are associated, as "directly observable concrete elements" (Tremblay, 1968; p.87), which may reveal the place occupied by the *integrative distance* in the learning scenario. The technological level is part of the two levels. The institutional level was analysed in the contextual part of the article. The presence of these six indicators in our learning scenario will be measured as follows: indicator present, partially present, not present.

Table 1:   Grid of indicators related to the integrative distance of the ODL engineering (Papadopoulou, forthcoming).

Engineering level of OIDL	Indicators of integrative distance
Organisational level (learning engineering)	1. Project engineering 2. Open-cooperative learning scenario 3. Articulation of the double alternation
Operational level (accompaniment engineering)	4. Accompaniment of rhythm-training 5. Accompaniment of affordances of tools 6. Accompaniment of experiential training

For the analysis of the questionnaires, we created tables to have a global view based on the quantitative elements of the closed responses. We then analysed the textual elements of the open-ended responses.

Main results and their interpretation

The results of the learning scenario are presented according to the two engineering levels divided into six indicators. Those of the questionnaires are based on a summary table of the answers given.

Blended scenario analysis: organizational level

We begin with the analysis of the indicators of the organizational level corresponding to the learning engineering and the design of the blended course. This first analysis refers to the following three indicators: the presence of a project engineering, open-cooperative learning scenarios, a thoughtful articulation between presence-distance and theory-practice (see Table 1).

The *project engineering* is present in the scenario. One of the objectives of the course is to allow learners to experiment the process of creating a Portfolio. For an ethical accompaniment of their future accompanied, each of them had to create its own Portfolio project and carry out the process based on its own needs and paths. Thus, project engineering aimed to create a space for practice and experimentation of theory.

The learning scenario is open, which means that it gives a lot of freedom of action to the learners linked to its low prescription (Simonian, Quintin, & Urbanski, 2016). Indeed, no injunction was made on the frequency and the way to use the online space. Documents, videos and proposals for practical exercises and exchanges are present only for those who feel the need to refer to them. On the other hand, the indicator of distance cooperation is not present. The cooperation takes place especially during the face-to-face sessions with the organization of working groups around the practical workshops to facilitate the structuring of the portfolios of the learners. Thus, the online space only provided access to a forum to facilitate exchanges and remote assistance. We can therefore conclude that the learning scenario is only partially *open-cooperative*.

Finally, the scenario was built on the *double alternation* because it articulates theory-practice and presence-distance. More precisely, the face-to-face sessions are built between theory and peer accompaniment. This facilitates collective reflection on individual projects. A review of distance practice and portfolio advancements is also proposed. Distance sessions are built between theoretical reminders and practical work. They thus promote individual reflection on the project and invite the production of the portfolio.

Blended scenario analysis: operational level

The operational level focuses on accompanying the experiences of the learners during the implementation of the Portfolio course. Our analysis is based on the following three indicators: accompaniment of rhythm-training, of tools' affordance and experiential training (see Table 1).

The accompaniment to the *rhythm-training* is not present in the learning scenario. Learners are indeed free to work remotely according to their own temporality and pace. No accompaniment is offered on the rhythmic habits of the learner to facilitate the appropriation of their distance learning.

The experiential accompaniment to the *tools' affordance* (Simonian, 2014), which also aims to raise awareness of the distance learning approach through a focus on technical tools, is only partially present. The experimental status of the scenario leads to a low degree of intentional prescription of the use of tools. Thus, the articulation between the prescribed and the real aimed at taking in hand the tools offered to the learners, while allowing them

to adapt them to their own realities and needs. For the same reasons, the articulation between the appropriation of institutional tools and the use of non-institutional tools (Simonian, 2014) by the learners was enabled. The learners used other communication tools than those offered in the online institutional environment, in order to communicate and achieve their goals, create their portfolios. On the other hand, the lack of cooperative activities online, did not allow the establishment of a socio-emotional climate through the communication tools.

Finally, the accompaniment of the *experiential training* is an integral part of the learning scenario as the course aims to raise awareness of professional paths through the narration of experiences lived outside the training centre and the formalisation of their portfolios. This accompaniment is done both in face-to-face by the trainers and the peers through group work, as well as in distance through online resources and exchanges, theoretical reminders and practical work.

Analysis of learners' feedback

Of the learners who responded to the questionnaires, 81% visited the online space between the first and second session (first questionnaire), 88% between the second and third (second questionnaire) and 63% between the third and fourth (third questionnaire). The reasons were (a) the instauration of a new habit (go online) that students had to establish, which requires a certain amount of time, (b) the respect of learners' individual temporality, lack of time (c) the technical difficulties.

87% of participants said that the online environment was adequate and/or complementary to their expectations. Among the most cited expectations, we note the accompaniment for the realization of their Portfolios by the resumption of the content seen in face-to-face courses, access to complementary content and collective online accompaniment by the group and the trainers. They also mention the need for an accompaniment on the rhythm of the training: "For my part, it would be useful to have a small email/alert when resources are put online, I won't think systematically to go there" (P, Q1) or "allowing the possibility of seeing videos explaining a concept upstream in order to enter the context/course more easily" (N, Q1). Finally, the need to accompany the tools' affordance is also mentioned because the platform was characterized as not intuitive (A, Q1).

Regarding the consultation of online resources, on average 84% of participants consulted textual resources and articles, 68% videos between one to two times, 62% instructions for the exercises during the intersessions, and only 55% the forum space for online exchanges. While 97% of the participants felt the resources were useful, only 77% felt the same for the forum.

Conclusion: implications of the study in the field of adult education

This study makes it possible to identify three main results reflecting the way in which engineering in adult education is transformed by the integration of new technologies.

By combining the analysis of the scenario and the learners' responses to the questionnaires, we realize that there is a coherence between the weaknesses noted in the accompanying engineering and the effects produced on the participants. More specifically, the cooperative aspect, the accompaniment of the rhythm-training and the accompaniment of the tools' affordance were the three indicators noted as absent in the engineering of the scenario. The criticisms made by the learners about the gaps in the training were also about these three elements based on the need for an accompaniment in: the use of the online platform, the accessibility of the resources, the individual rhythms of the learners, distance cooperation.

Our study confirms, therefore, that a simple transposition of existing practices of the face-to-face learning is not sufficient for the design and animation of an open and *integrative* distance learning (OIDL). The need to transform our practices by taking into account the elements introduced by the digital environment was then demonstrated.

However, transformation occurs only through action and in response to the environment (Dewey, 2006). Therefore, the following recommendations can be established to accompany the transformation of the practices of the adult trainers:

65. an "experiential learning" for the transformation of practices through a praxeological experimentation approach (Galvani, 2010; p.276);

66. an "experiential accompaniment" for the transformation of practices through the accompaniment of the experiences (Papadopoulou, 2020; p.306);

67. a "dialectical accompaniment" for the transformation of practices through the establishment of constitutive and interactive relationships (Basseches, 1984; p.22).

The results presented above, based on one case study, are not necessarily representative of all the engineering transformations carried out by the introduction of blended scenarios into adult training. This study needs to be refined, in particular by comparing the results with the data collected from future promotions of the Master degree or other courses. It would also be necessary to submit the same data to external researchers in order to neutralize the potential biases related to the involvement of the teachers-researchers in the course.

However, the study confirms the relevance of the OIDL engineering model and the increased importance of accompanying the rhythm-training and tools' affordance in this

transformed context. As a result, the fact remains that learning scenario, learning engineering, accompaniment engineering and integrative distance seem important to articulate when transforming traditional training into blended training in order to take into account the specificities of adult learners, their experiences and needs.

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