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TOWARDS A CO-DESIGN APPROACH TO DIGITAL DEVICE FOR LEARNING

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Abstract

Information system does not reflect the reality of its users, it builds it. Contrary to predictions that ICT would get a new wind on innovative pedagogy blowing, current e-learning platforms have instead a binding effect on effective implementation. They are often established as dominant models. As feedback on design, this paper will first describe the difficulties encountered during the design of the Tandem Canada platform. Secondly, we will propose an innovative approach to allow users to become true co-designers of their own digital device for teaching/learning. Finally, the paper will show how to instantiate this participatory approach to design pedagogical models.

Keywords: e-learning, innovation, educational platform, co-construction, participatory design, viewpoint.

1 INTRODUCTION

The introduction of innovative pedagogy is now widely encouraged. These innovations are supported by e-learning platforms in universities. The implementation of innovative pedagogy involves many actors: teachers, educational experts, "institution", students. These stakeholders may have different and complementary needs, which are often only partly taken into account in current platforms. This statement was observed when developing the Tandem Canada Platform [1] on a Moodle instance. More generally, e-learning platforms have rigid structures, which may allow adjustments, but no real innovations that would question their structure. These two difficulties (rigidity and consideration of needs) have been partly solved by recent proposals for flexible platforms [2]. However, a question arises: how to get the models to implement on these platforms? And to go further: How can these models reflect the needs of different stakeholders such as teachers, learners, pedagogical experts? To address these issues, we propose an innovative co-design approach called DEMOS. We applied on the example of the design of the Tandem Canada platform to show the contribution of this approach.

Section 2 presents difficulties encountered when setting up the Tandem Canada Platform on a Moodle instance. Section 3 describes the steps of the process and part of the DEMOS meta-model. Section 4 proposes a first experimentation of the approach with the Tandem Canada platform.

2 A CASE STUDY: THE TANDEM CANADA PLATFORM

This platform was elaborated to learn French and English in a tandem approach. Teachers can register and find a partner class. When they found it, their students grouped in tandem can exchanges by text, audio, video in a synchronous or asynchronous way. This platform is composed by different modules, specially the exchange space module is a Moodle instance. This module offers to teachers a technological and pedagogical support to make language learning in tandem with their students. This mode of teaching/learning is not supported by the Moodle platform: its structure is rigid, and its functions are not personalisable.

This platform was designed from the description of a set of communication tools that are useful to do language learning in tandem: audio, video, text in asynchronous and synchronous ways. From this description, the Moodle platform was chosen because it already proposes this set and can be used freely. However, it was not possible to install only the tools needed. Many parameters, which were not useful to the Tandem Canada platform, were not able to be deleted. Teachers can be confused when preparing learning activities.

Figure 1 shows a good example of the constraint forced by the model of dominant e-learning platforms. When two classes A and B are partners, each teacher has to prepare activities for her/his students, that involves three parts of the course:

- The teacher of the class A gives a work to her/his students and the teacher of the class B can see this work;
- The teacher of the class B gives a work to her/his students and the teacher of the class A can see this work;
- The teachers of the two classes A and B provide collaboration activities for tandems (the whole students of the classes A and B).

To represent these three parts with Moodle, three different courses were created since the roles are not the same: editing teacher or teacher. For instance, on the screenshot, English 1020 corresponds to the work given to the Simone Roy's students, while French 101 – Section 1 consists of the work given to the Linda Smith's students. Finally, Tandem French 101 – Section 1/English 1020 is the space for tandem communications between the students of these two classes. In this case, Linda Smith is connected, she is editing teacher for French 101 – Section 1 and Tandem French 101 – Section 1/English 1020 whereas she is teacher for English 1020. This would have been better to group together these three parts in order to follow all the activities on a same space.

The interface of a Simone Roy's student is composed of two parts, one for the work to be done English 1020 and one for communications in tandem Tandem French 101 – Section 1/English 1020. On a same way, the interface of a Linda Smith's student has a part to the work to be done French 101 – Section 1 and a part to communications in tandem Tandem French 101 – Section 1/English 1020. This configuration can generate several inconveniences.

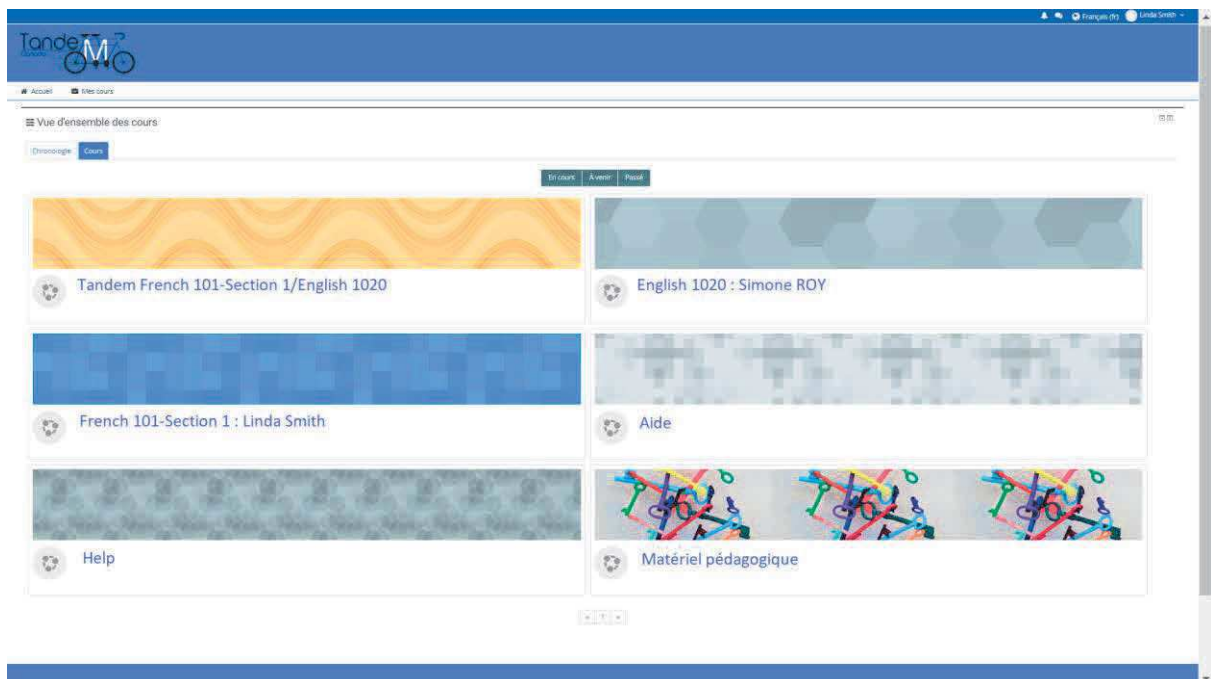


Figure 1. Screenshot of the teacher interface of the exchange space.

As seen on this example, the reality had to be twisted to give the closest match to the platform formalism. The results obtained could disrupt the effective functioning of learning activities, if not a lack of motivation for users.

3 PROPOSITION OF A VIEWPOINT DESIGN APPROACH

Today, there are user-centred propositions or development-based propositions to design the digital device for teaching/learning [3], [4]. Their design is still in the hands of e-learning platform developers. Educational consultants, domain expert, teachers, learners cannot take over them.

In this paper, we present a new approach allowing the users to conduct the design workshops. Then, such an approach would enable to pass from user-centred design to participatory design [5], so the users become true co-designers of their own digital device for teaching/learning. This approach is called DEMOS for Design mEthod for demOcratic information System. It aims to involve future users in the design of their information system while respecting their viewpoints. The method is presented in the form of a MAP [6]: a navigational structure with a selection of four intentions (circles) and strategies (arrows) to achieve it (fig. 1). The process is divided in three workshops (scoping workshop, viewpoint workshop and sharing workshop) and a phase of implementation. The workshops are facilitated by a moderator of the meth-od, but it is the future users who participate and implement the strategies mentioned.

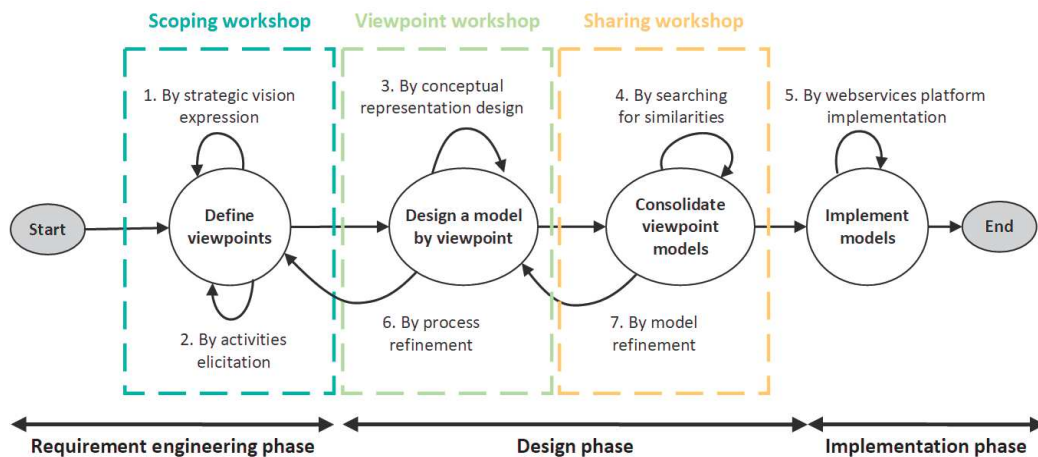


Figure 2. General view of DEMOS.

First, participants have the opportunity to express divergent visions about the pedagogical tool to be built (1. By strategic vision expression). Secondly, they elicit their activities (2. By activities elicitation). This allows the emergence of different participants viewpoints on the future platform. Thirdly, the participants, grouped according to their viewpoint, can design their own pedagogical conceptual model (3. By conceptual representation design). Lastly, the conceptual models are linked together by the participants, to get consolidated viewpoint models directly implementable in the future system (4. By searching for similarities).

By means of various activities such as photo-language, mind mapping, user stories writing, participants are able to develop standardized conceptual models by always speaking in their current vocabulary. The metamodel part of DEMOS presented in Figure 3 shows that each viewpoint corresponds directly to a strategic vision. Each viewpoint is also directly related to a vocabulary, i.e. concepts, descriptors and links. Thus, everyone can express their needs without having to conform to the vocabulary from another viewpoint or any current platform.

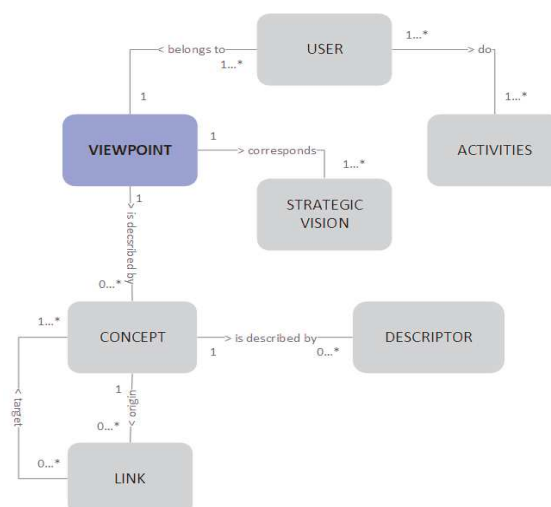
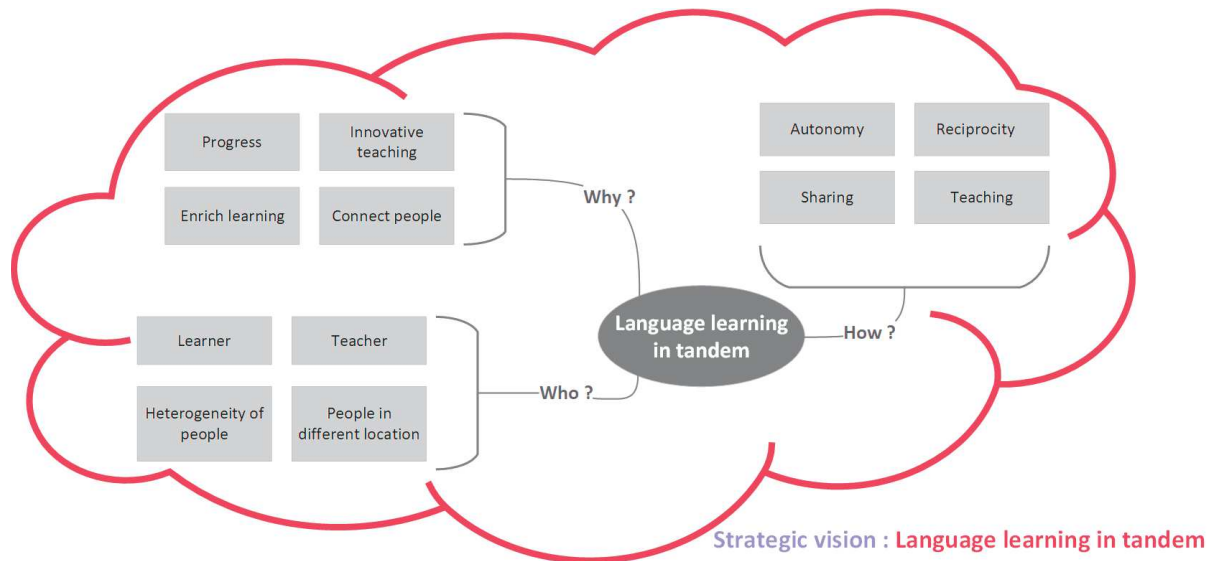


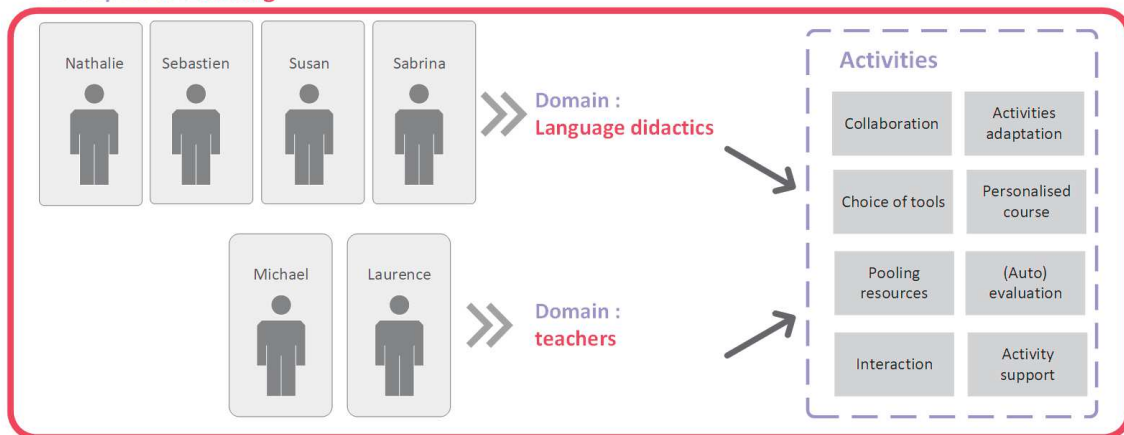
Figure 3. A part of DEMOS metamodel

4 DEMOS INSTANTIATION WITH THE TANDEM CANADA PLATFORM

As a first step to experimentation, we worked with teachers to gather their needs for the Tandem Canada platform. By respecting the sequencing of the DEMOS method and its meta-model, we present a part of what we have obtained. This is a simple modeling, which deserves to be deepened.



Viewpoint : Teaching



Conceptual model : Language learning in tandem

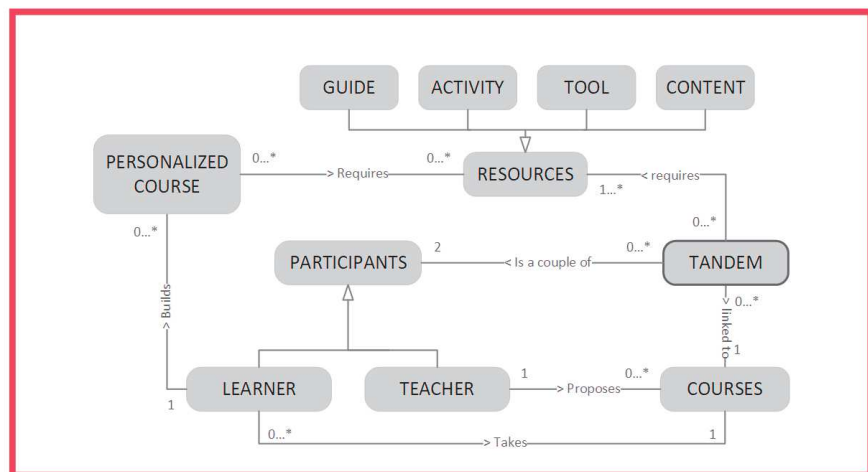


Figure 3. Instantiation of DEMOS: Language learning in tandem from “teaching” viewpoint

For the moment, the modeling corresponds to a single viewpoint "teaching". Our goal is now to continue the experimentation by conducting the same workshops with pedagogical experts and learners, in order to compare and group the representations obtained with each viewpoint.

We think this methodology allows the ability of translating more complex and abstract pedagogical requirements into artifacts operable by software engineers.

5 CONCLUSION

E-learning platforms are widely adopted to give online courses. Some experts have been excited because they considered these platforms offer the motivation to increase pedagogical innovation. Other experts, for instance [2], [4], [7], more careful, perceive e-learning platforms as tools enabling to reduce several constraints, but also question on their pedagogical efficiency. These platforms are established as dominant models [7], creating uniform learning environments, without personalisation. The structure is fixed, the functions are not personalisable and they do not support all teaching modes [2].

As design feedback, we discussed encountered difficulties when the development of the Tandem Canada platform. It was elaborated to learn French and English in tandem. The free software Moodle was exploited to create the exchanges space for teachers and learners. This choice was motivated its dominant position as e-learning platform. However, the designers had to adapt the pedagogical requirements to the structure of the platform formalism, while it should be the other way around.

In order to address this issue, we proposed a new participatory design, DEMOS, with which the users become true co-designers of their own digital device for teaching/learning. We showed how this methodology could be applied to the design of the Tandem Canada platform to focus on the teaching viewpoints. More experience is planned to collect the different viewpoints and create conceptual models more representative of users needs. So, the results obtained will lead to a better choice of the digital device.

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