

Collective design as a support for professional development: a case study

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Abstract. Integrating digital resources into teachers' practice requires, notably, the availability of resources offering flexibility of use (Morgan, 1990) and proximity to teachers' schemes (Crisan, Lerman, & Winbourne, 2007). Collective designing and sharing of these resources can facilitate this integration and contribute to teachers' professional development (Quéré, 2019). The e-FRAN IDEE research group work looks at the cooperation between teachers and researchers jointly designing a digital resource to teach English. The aim of this paper is to observe a part of cooperation on one teacher's professional development. In this case study, I show that the interactions between teachers in the group, Ginger and Val, lead to the discovery of new resources, and working with the latter foster new knowledge.

Keywords: cooperative engineering, collective design, professional development, English as a foreign language.

1. Introduction

Also mentioned elsewhere (Quéré, Gruson, & Le Hénaff, 2018), the research presented is part of a French research project called e-FRAN IDEE² (Digital Interactions for Education and Teaching) conducted in conjunction with a research group studying Collectives' Teachers Group and Resources for Students' Autonomy (CERAD). As part of a multidisciplinary group, we are studying to ascertain if collective work, here between teachers, can help the latter to develop their use of digital resources in class. For a better integration of digital uses in schools, it is essential to involve teachers in the designing of resources (CNN, 2012). In foreign language didactics, research has shown that digital resources "may offer regular

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2. Based on cooperation between teachers and researchers who implement and re-implement didactic activities on a specific topic.

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opportunities to modify the very logic of teaching/learning practices” (Gruson & Sensevy, 2013, p. 222). Furthermore, collective designing and sharing of resources can facilitate the integration of digital resources into teachers’ practices and contribute to their professional development (Quéré, 2017).

2. Theoretical framework

The theoretical framework named documentational approach is applied (Gueudet & Trouche, 2010). Gueudet and Trouche (2010) argue that teachers develop documents comprising resources but also a scheme³ of use of these resources during their work, and that their professional development is directly linked with the development of these documents. All the resources are organised into a resources system. It can be an individual resources system when it concerns the resources of an actor, or a collective resources system, for all of the group’s resources.

In order to highlight these documents, document tables are used (Gueudet & Le Hénaff, 2015). One line of a document table corresponds to a document developed, or being developed, by a teacher in relation to a goal identified for a given situation class⁴. The document table is used to describe the document, by associating resources and a scheme for using them. The scheme is composed, among other things, of operational invariants, which will be interpreted as professional knowledge in the *result and discussion* section.

The aim of this paper is thus to analyse the effects of collective design on teachers’ knowledge involved in this work.

3. Method

The data collected is a part of a larger study, mentioned earlier, e-FRAN IDEE. The qualitative methodology is built as follows: regular follow-ups of meetings, observations of implementation in the classroom, and interviews with the teachers. This data collection took place over two years. It includes a total of 36 hours of meeting videos and 24 hours of classroom observations. The teacher’s group is composed of Ginger, Val, and Aurore. For this case study, one of the teachers has been chosen, Ginger, and one particular episode showing her activity is analysed.

3. A scheme is an invariant organization of the activity for a given class of situations (Vergnaud, 1998).

4. According to Rabardel and Bourmaud (2003) a situation class describes situations of professional activity that are similar in terms of tasks to be accomplished and actions to be undertaken with the same objective in mind.

only, without projection on the board. Secondly the collaborative word cloud, developed, was hidden until the teacher decided to show it to the whole class. In addition to temporarily hiding the cloud, Ginger explained she was using the software’s features to prevent students from making the same word bigger:

“[to]set up the word cloud so that they [teach students] don’t type the same word twice. They could enter ten or more words but not the same word. For example, typing ‘job, job, job’ to make it bigger is not allowed”.

As a result of teacher’s work analysis, the following document table is produced (see Table 1).

Table 1. Document being developed in connection with the situation class ‘designing and implementing a listening comprehension activity’

Goal(s)	Used resources	Rules of action	Operational invariants
Designing and implementing a listening comprehension activity	Non-digital resources	<ul style="list-style-type: none"> • allow the student to see the words he or she is typing; • lock the number of entries to ensure that new words are searched for; • display the collaborative cloud once the task has been completed. 	<ul style="list-style-type: none"> • allowing students to see their work allows them to control what they have written; • using the software’s settings allows you to control student actions and limit attempts at simple copying; • showing students the final collective production supports students’ involvement in the work.
	Digital resources		

This document table introduces a document under development and shows the impact of designing work with Val on Ginger’s choices. For example the operational invariant, allowing students to see their own work but not that of other peers, is a design choice arising from collective work. Indeed after Val explained her difficulties with the word cloud activity – pupils did not see the words they typed on the computer displayed either on their workstation or on the board during the activity; this slowed their progress – Ginger made the choice to select a new software, Beekast, and to adjust her didactical choices according to Val’s feedback.

In this document table, Ginger’s individual resource systems (Beekast) and her operational invariants, resulting from her past experiences and exchanges with Val,

are articulated to give rise to a document (Table 1) which is interpreted as a sign of the teacher's professional development.

5. Conclusions

In conclusion, in this short paper I presented a part of Ginger's case. I have shown that her participation in the collective teachers' work evolves her knowledge in two ways: first she relies on the knowledge of the other members to adjust her implementation, and second this leads her to modify the software used and adapt the instructions given. This work of adjustment, modification, and analysis, linked to interactions with Val, has effects on Ginger's knowledge. Collective design allows teachers to access new resources, here digital resources, and seems to support the development of new knowledge among the members involved in this work.

The continuation of my work is based on the verification of these initial findings. To do this, I will observe a collective composed only of teachers in order to see how collective design can have an effect on their knowledge in the absence of researchers.

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