

Scaffolding for computer supported writing to learn activities in vocational training

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Abstract: Dual-T project investigates how ICT can support learning activities involving sharing and reflection about professional experience in order to harmonize school learning with practical experience. In this study we tested the effects of low and high scaffolding on collaborative writing activities on professional procedures. We expected longer, more correct texts to emerge from strongly scaffolded activities than from weakly scaffolded activities.

Theoretical frame

Recent research on initial vocational training education has shown the existence of a gap between field knowledge and knowledge taught in vocational schools (Filliettaz, 2008). One of the main issues concerns knowledge and skill transfer between school and workplace (Eraut, 2004). In our project, we are interested in identifying original technological support and pedagogical designs for professional skills learning and transfer in vocational educational training (VET).

In this context, we adopt a “writing-to-learn” approach (Hayes and Flower, 1980; Hayes, 1996). It assumes that writing promotes the acquisition of knowledge, since domain knowledge should be retrieved, reorganized and incorporated into a linear and understandable form. Extending this cognitive view, Galbraith (1999) claims that knowledge transformation leads to knowledge constitution, which makes writing a promising instructional tool.

Professional procedure learning and transfer is a critical issue in VET. Anderson’s ACT-R (1993) model claims that procedure acquisition is based on learning from declarative traces of initial problem solving. Writing could then be a powerful tool for constructing and refining the declarative representation of procedures.

Moreover, confrontation between learners’ conceptions and experiences should promote reflexive thinking and epistemic monitoring, embodied in the written productions (Crook, 1994; Littleton & Light 1999; Spek, Johnson, Dice & Heaton, 1999). In addition, collaborative writing activities should support not only individual knowledge acquisition but also the collaborative dimension of domain knowledge building. Tynjälä, Mason and Lonka (2001) show that studies of the effects of collaborative writing on learning are still rare (Gielen, Dochy, Tops, Peeters, 2007; Keys, 1995). Most of the research is done on the improvement of the writing process and writing skills. We consider that a peer collaborative approach to writing-to-learn in a VET context should be valuable in terms of knowledge building, procedure understanding and acquisition. Thus, in this research we are interested in investigating the impact of collaborative writing activities on the construction of a mutual declarative representation of the procedures. This is the basis for deep understating of procedures thus for acquisition and transfer.

Computer supported collaborative writing to learn activities can be supported by many types of tools. Considering our context and the population we are working with, we turned mainly towards wiki tools. One of the main advantages is the powerful information sharing and collaboration features that we used for other activities in this research project. They also afford users the added advantage of reducing the technical skill required to use these features, by allowing students to focus on the information and collaborative tasks.

Using scaffolding to engage students in reflection and deeper data processing has been shown to be successful in a number of domains. Research noted that different type of scaffolds may leave to different learning effects (Ge&Land, 2004, Rosenshine, Meister & Chapman, 1996). In this study we intended to use scaffolding in order to support for better writing to learn activities thus for deeper reflection, knowledge organization and transfer. We built the guiding questions on the basis of the work of Lin & Lehman (1999) and respecting the “how”, “why” main approaches.

Research questions

The goal of this research was to develop and assess computer-supported learning designs based on collaborative writing activities and their impact on learning experience and outcomes. Based on previous findings on peer assisted writing to learn in VET (Gavota, Betrancourt, Schneider, Richle, 2008a), this research investigates the role and the types of scaffolding appropriate for activities supporting professional procedure understanding and learning.

We assumed that high scaffolding is supposed to guide reflection and improve self-regulation, but it can prevent the apprentices from handling complexity and therefore be inappropriate to support transfer. Low

scaffolding would also mobilize valuable knowledge but would be associated with less organization and poorer productions.

We expected that highly scaffolded activities produce better quality explanations than lowly scaffolded activities as well as better quality quotes.

We also expect that high scaffolded activities support better long term learning and transfer of the knowledge than light scaffolded activities.

Method

Participants

We worked with 2 third year classes of dental care apprentices. 29 apprentices participated in the study: 15 of them were in the first class and 14 in the second class. Each class corresponded to a condition in a between-subject quasi-experimental design.

Material

In order to support apprentices' collaborative writing activities, we used a wiki embedded in the ELGG social software platform. This study engaged apprentices in writing, explanation, rewriting and commenting activities. Since the activities were closely linked, we chose not to use the wiki's "discussion" page but to spatially integrate all the activities on the same page, in order to facilitate the information linking and processing (Van der Pol, Admiraal & Simons, 2006).

We also used a subjective "learning questionnaire" containing four open questions about the importance of the activity, the tasks they considered the most useful and the things they considered having learned from each task.

Task

The activity was integrated in the "administration course" and aimed at learning how to produce a quote for a treatment. Students had to individually fill in a digitalized quote form and explain the procedure they used to fill in the quote as well as the content that they filled in (medical treatment procedure). Furthermore, a peer had to read, verify and comment on the work of a colleague, and eventually change what she considered wrong. In the end, the teacher orally discussed the entries with the students and clarified their correctness.

The tasks were identical for both classes. The only difference was that the first class had scaffolding questions in order to guide their explanations of the "filling in procedure", the "treatment procedure" and the commenting activity. The second class was asked to do the same activities as the first class except that they didn't receive any scaffolding questions.

At the end of the activity we administered the subjective "learning questionnaire" We wanted to foster students' reflection on their learning and on the activities they thought helped them most.

A week after this activity, students took a test on creating quotes.

Analysis and results

The study took place in the beginning of December 2008 and the final results will be available for the conference

This analysis mainly takes into account initial quality (correctness) of the quotes (filled in individually), explanations' quality, final quality of the quotes (after peer intervention), quality of comments and explanations from peers.

The formal quality analysis of explanations and comments is based on a modified SSQS scale (Ransdell and Levy, 1996). The measured dimensions are grammar, formulation, exactitude, and layout features. One to five point evaluation scales are used by multiple independent judges.

The content quality of initial and final quotes as well as the content quality of explanations and comments is assessed with the help of the teacher, by using a detailed evaluation grid.

The history of the written productions and quotes are easily accessible from the wiki. Text and quotes evolutions and quality of interventions is assessed on the basis of a previously used coding scheme: types of interventions (correction, completion) are identified as well as their quality (appropriateness, correctness).

The correspondence between the quote, the explanation as well as the quality of comments will be analyzed qualitatively. This will allow us to analyze the usefulness of the visually integrated writing tasks and the appropriateness of using a wiki to support collaborative writing activities in a VET context. Moreover, we will be able to discuss ergonomic aspects of this type of tools with regard to the learning tasks.

We also will analyze the subjective "learning questionnaires" and compare the initial students' performance (in the experimental activity) with the final one (at the test).

Discussion

Our research refines theories in computer supported writing to learn field which has been very little treated. Previous studies (Gavota et al., 2008(a),(b)) showed the feasibility and utility of this type of approach.

Collaborative writing activities take advantage of apprentices' knowledge and professional experience heterogeneity, thus representing a promising instructional tool to foster reflective and meaningful learning in vocational education. Relevant information about scaffolded peer assisted computer supported writing activities will be identified with the present study. More precise peer assisted writing design issues will be revealed and refined with regard to VET context characteristics.

From a practical point of view, useful design issues in collaborative writing-to-learn activities will be identified. Ecological study in a vocational training context will allow design refinement thus conception of useful general rules for the use of computer supported collaborative writing-to-learn activities in a VET class. In our studies we hope to identify and propose useful, pertinent guidelines for instructional designers and teachers regarding the pedagogical scenarios and appropriate electronic tools

This dual (theoretical and practical) approach supports for valuable advancement into comprehension and utilisation of collaborative designs in computer supported writing to learn.

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