Integrating Collaborative and Mobile Technologies for Fostering Learning about Negotiation Styles

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Abstract: This paper presents and discusses our efforts aiming to expand the potential of an existing CSCL environment through the integration with additional software applications in order to support a cross context learning activity. We used a CSCL environment for supporting asynchronous types of interactions, mobile devices for face-to-face interaction and a dedicated web application for self-assessment. We present the design and implementation of a scripted learning activity that deals with negotiation styles and describe the integration of different software applications that supported the students' interactions along the various activity phases. The results indicate the potential and benefits of the integrative approach using collaborative and mobile technologies in order to support and enhance a wide range of pedagogical activities.

Keywords: Collaborative learning, script, negotiation, collaborative and mobile technologies, systems integration

1. Introduction

A CSCL (Computer Supported Collaborative Learning) script describes a well-defined instructional strategy organized into a collaborative pedagogical activity and supported by the use of information and communication technologies (ICT) [1]. According to Dillenbourg and Jerman [2] a CSCL script addresses five main attributes of the collaborative learning process: the task that students have to perform, the composition of the group, the way that the task is distributed within and among groups, the mode of interaction and the timing of the phase. A script may also include students' interactions with learning resources originating from different sources like teacher's materials or with emerging learning objects (ELOs) contributed by their peers [3, 4]. Learning activities may involve distinct learning contexts in which the learners' trajectory should go through [5]. This multiplicity of contexts may influence the activity trajectory and challenges the activity planners to find ways in order to provide a seamless learning experience [6]. Seamless learning implies that learners can learn whenever they are curious in a variety of scenarios and that they can switch between these learning settings easily and quickly using their portable device as a mediator [7]. The need for supporting a seamless learning experience becomes prominent when considering Goodyear's claim [8] addressing two perceptible changes in the field of educational research. The first is a shift in our sense of the spaces and contexts in which education takes place, as different learning activities are becoming more commonly distributed across a variety of contexts. The second change is a wider understanding with the conception of educational praxis, acknowledging the growing importance of design. The current areas of focus addressed in this paper are grounded in

these two major changes: 1) The design of an interactive learning environments that include CSCL scripts and different software tools to support a seamless learning experience 2) Exploring how the proposed approach can be integrated into everyday educational practices in order to become a sustainable part of the learning environment. Addressing these two aspects calls for an integrated approach for learning design based on advancing the current socio-technological configurations available in educational settings nowadays. In this paper, we describe our current efforts to design and enact a particular learning activity dealing with negotiation styles and its implementation with university students. The topic of negotiation styles is traditionally taught in a regular face-to-face session performed in a regular classroom [9]. However, this topic presents many opportunities to be taught in different ways that implements advanced learning approaches enabling students to cope with real life negotiation opportunities [10]. We present the pedagogical requirements and goals and how these have been transformed into actual learning tasks supported by different ICT solutions. The actual implementation of these goals relies on the use of various CSCL scripts and software applications in order to ensure a seamless learning experience.

2. Learning about negotiation styles

2.1 Integration of cross context learning with CeLS

The interactive learning environment that was used to support this activity was Collaborative e-Learning Structures (CeLS) [11]. CeLS enables teachers to design and enact online collaborative activities using various pedagogical approaches such as collaborative problem solving, peers' products assessment, competition, jigsaw and combinations of the above. CeLS was originally developed for asynchronous activities performed via stationary or laptop computers. However, a CeLS script can also include notations that address interactions to be performed with other communication technologies like mobile phones or dedicated applications [12]. In the next section we describe such integration designed to provide and support a seamless learning experience.

2.2 Activity script

The learning activity was designed for support undergraduate and graduate courses dealing with negotiation and conflict management. The main goal of this activity is to familiarize learners with the concept of negotiation styles, to develop their ability to argue according to a certain style and to identify a person's style according to the arguments he expresses during a negotiation. The activity was planned to be implemented after the teachers' introduction of Rahim's model [13] defining 5 types of negotioation styles. Table 1 summarizes the structure of the activity and its interrelated pedagogical, technological and implementation aspects.

2.3 Technological integration and implementation

The activity script enactment is supported by integrated technologies. CeLS environment serves as a main technological platform for the enactment of the activity script and its different phases. Two stand-alone applications, namely SMS-HIT and NeSI [12] have been developed to support the different phases, as described in Table 1. These applications are used as extensions that enable to expand some of CeLS ´capabilities. SMS-HIT and NeSI have their dedicated run time engines that generate interaction pages supported by a variety of end user devices according to predefined activity properties. The user interactions with

both applications are stored in their dedicated SQL servers using XML data format. This information is retrieved following to a CeLS request. The retrieval process is performed by a dedicated middleware application that analyses the CeLS request and performs a data migration to the CeLS database. This process is performed according to the CeLS script rules using the phase and the building block identifiers [12]. Figure 1 illustrates the script implementation supported by integrated technologies.

Table 1: Description of the script pedagogical, technological and implementation aspects

Phase	(1) Self diagnosis	(2) Learner's reaction according to style	(3) Identifying statements styles	(4) Negotiation style diagnosis	(5) Summary and debriefing
Students' Task	Identify your primary and secondary negotiation styles according to Rahim's model [13]	An employer-employee conflict scenario is presented. Express an argument reflecting your negotiation style from both positions	Students are presented with several peers' statements. Identify the negotiation style of each statement.	Diagnosis of personal negotiation styles using a validated questionnaire [13].	Class discussion based on a comparative representation of students' inputs contributed during the activity phases.
Instructional Goal	Understand the negotiation concepts by relating student's implementation to personal situation as a motivational strategy	Develop student's ability to argue during a negotiation process according to one of the styles	Foster student's understanding of the negotiation concepts and their ability to relate statements to negotiation styles	Compare the declared personal negotiation style with the profile diagnosed by an objective measuring tool	Summarize and reflect upon the activity phases
Type of interaction	Face to face	Asynchronously			Face to face
Place of interaction	Classroom	Anywhere			Classroom
Duration	1 class session	2-3 days	2-3 days	1 class session	1 class session
System	SMS-HIT PRS	CeLS		NeSI	CeLS
Interaction device	Mobile	Stationary or laptop			Teacher's computer
Data format and storage	SMS-HIT SQL server database	XML structure stored in CeLS SQL server database		NeSI SQL server database	CeLS SQL server database
Integration methods	Integration of SMS-HIT data into CeLS database	Integration of SMS-HIT data into CeLS database by data fetcher using an XML data structure	No need of integration at this phase	Integration of NeSI data into CeLS database by data fetcher using an XML data structure	Reuse of integrated data from phases 1 and 4

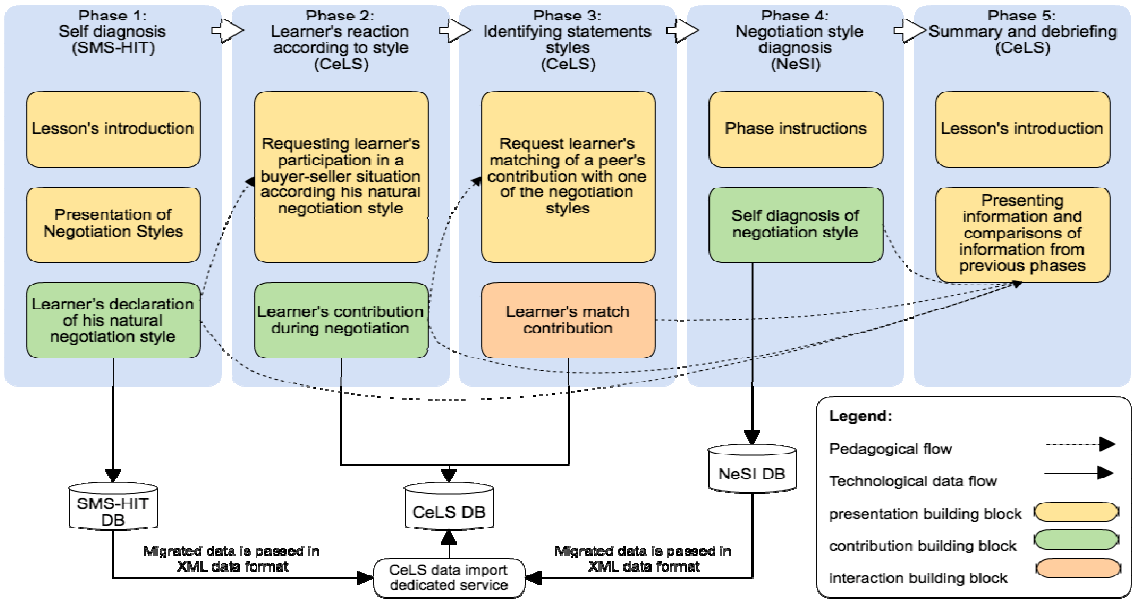

Figure 1: The script for supporting learning process for negotiations styles

3. Evaluation of the learning activity

The learning activity was tested with 25 students in a graduate course that took place during the spring semester of 2012. The evaluation was based on in-depth data analysis of all the students' contribution during the activity phases using the data stored in the CeLS database, observations of the class sessions and open interviews with the students and the teacher. We present a glimpse to the analysis of students' contributions. Most students (64%) managed to perfectly identify their own style (phase 1). Most students (60%) managed to partially match their peers' statements (phase 2) with the declared style while only 20% managed to achieve a perfect match. A further data examination reveals that all the statements that were perfectly matched belonged to students that have perfectly identified their own style. This finding is not surprising since students who were not fully aware of their own negotiation style may not have express it clearly enough and as a result peers could not definitively associate the argument with a style.

During the interviews students expressed their personal impressions about the experience, described their level of engagement and evaluated the usefulness of the activity for promoting their understanding of the new concepts. Most students mentioned the structure of the activity as an aspect that provided an intriguing way to acquire and practice theoretical skills. They also appreciated the use of the SMS-HIT application during the face-to-face session for providing meaningful interactivity by using the mobile technologies that are available to everyone. Learners were asked about the added value of the transferability and reuse of the knowledge acquired from one phase into the following phases along the activity. They considered these aspects as a key factor that enabled knowledge acquisition, peer learning, learning in action during negotiation practices and finally synthesis of new insights.

The teacher had 14 years of previous experience of teaching this subject and trying to conduct similar activities without any kind of ICT support. She considered the activity structure and its supportive software applications as convenient means that enabled her to conduct cross context activities that were not possible before. The major challenge mentioned by the teacher was the reliance on learners' cooperation because of the interdependencies between the phases.

4. Concluding remarks

Pedagogical activities may comprise of a variety of ways in which students interact through the use of different technological means along the learning activity phases. We have briefly presented our current efforts aiming to expand the potential of an existing CSCL environment through the integration with additional software applications in order to support a cross context learning activity. In our case, we used a CSCL environment for asynchronous types of interactions, mobile devices for face-to-face interaction and a dedicated web environment for self-assessments. We also presented the relevancy and implications for design of the mobile seamless learning dimensions along the activity phases that are related to the following aspects: students' shift between personal and social learning, phases that occur across time and location, student's accessibility to ubiquitous learning materials along the phases, involvement of physical and digital learning environment, shift between learning tasks along the phases and finally, knowledge synthesis that occurs along the activity. We have also illustrated the kind of ICT support that can be provided in order to facilitate a smooth transition between the different phases, thus supporting a seamless learning experience. One of the major challenges of today's education is no longer about finding the best ways for knowledge delivery, but rather designing, developing and delivering learning environments, digital tools and activities for learners to construct knowledge by engaging and inspiring them to learn. These aspects

have inspired the efforts described in this paper and we will continue working in this direction. Our forthcoming efforts will deal with the refinement of our approach and the development of different software applications (with a focus on mobile devices) and their integration within other subject domains. One of our objectives is to further understand the potential and challenges involved in the integration of software applications and user generated content designed for supporting learning across contexts using collaborative scripts.

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