Mobile voting tools for creating collaboration environment and a new educational design of the university lecture

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Abstract. Mobile devices can enhance learning experience in many ways: provide instant feedback and better diagnosis of learning problems; enhance learner autonomy; create mobile networking collaboration; help design enquiry-based activities based on augmented reality, geo-location awareness and video-capture. One of the main objectives of the international research *Enhancing Technology Awareness and Usage of m-Learning in Russia and Norway* was to evaluate the pedagogical impact of mobile voting system (Student Response System) integration on re-designing a traditional university lecture course, creating a high level collaboration environment and changing student learning and academic performance. The framework of university lectures discussed in the paper enables lecturers to transform the way of material presentation and turn the traditional lecturing into interactive Student Response System (SRS) supported lectures, then into a flipped classroom, and then, in the long run, into a MOOC lecture. The analysis based on qualitative and quantitative data collected from two student groups (56 undergraduate students) in the 2012-2013 academic year showed that SRS supported lectures encouraged foreign language learners to produce more output in the target language, improve their intercultural competence and language skills and enhance their motivation.

Keywords: mobile learning, mobile voting tools, collaboration environment, immediate feedback.

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1. Introduction

Mobile networking enables instructors to create a collaboration environment based on an enquiry-based learning approach which inspires students to learn for themselves, bringing a genuinely research-like approach to the subject. This interactive, dialogic model of learning is similar to the processes of participation in research. The particular emphasis in this case is placed on fostering the development of collaborative, informal communities in which students learn by seeing and engaging with other people's approaches. Ubiquitous access to information mediated by mobile devices potentially enables a paradigmatic shift in education, since it changes the way classes are managed and the instructor's role (Beatty, 2004). This approach implies a fundamental change in the philosophy of teaching and learning. Mobile devices and tools are particularly applicable for achieving this as they effectively act as accelerators of the social interaction in the classroom.

2. Method

2.1. Research objectives

Mobile voting systems or clickers which have been used successfully within the context of the classroom for the last decade are very challenging, since they require instructors to rethink their instruction to leverage their potential advantages (Laurillard, 2007). Teachers may start with just minor changes, but major pedagogical changes may also be introduced. SRS is a polling mobile system that was developed at Sør-Trøndelag University College (HiST). The major advantages of SRS "compared to traditional clickers are independence of software and flexibility in use of voting devices" (Arnesen, Sivertsen Korpås, Hennissen, & Birger Stav, 2013, p. 169). It also provides instructors with an opportunity for quickly determining the level of class understanding at any given point in time, without the extra burden of grading.

SRS implementation allows for significant feedback pattern changes and material assessment re-design. The task/enquiry-based learning approach and SRS implementation are central to transformation of the lecture design as well as assessment and feedback patterns. SRS-supported lecture design presents a challenge for a lecturer because, first, the content material under discussion has to be re-arranged into chunks of 5-6 slides which are followed by a short SRS-supported test that consists of 4-5 statements; second, at least three SRS-supported tests should be created to provide better diagnosis of learning problems and to highlight weak points of content presentation on the part of a lecturer; and third,

a lecturer has to be ready with some enquiry-based activities to initiate post-test group discussion or brainstorming.

The main objective of the international research *Enhancing Technology Awareness of m-Learning in Russia and Norway* was to investigate the pedagogical impact of SRS integration on developing learner language and social skills. The participants of the research were 56 second-year undergraduate Russian students enrolled at Lomonosov Moscow State University who took part in SRS piloting as volunteers during the 2012-2013 academic year in a CLIL course *Introduction to American Studies*.

2.2. Data collection

Data collection was done in three cycles: pre-study evaluation of ICT (mobile) competence of experimental group students and their attitude to mobile learning before SRS implementation; intervention of SRS-supported tests as formative assessment tools and re-design of the traditional lecture pattern; post-study evaluation of learner attitude to SRS-supported lectures.

2.3. Reports of findings and data analysis

Data analysis of the pre-study cycle demonstrated that students had advanced levels of mobile competence; technologically and psychologically they were ready to use their own mobile devices in the classroom. At cycle 2, students of both control and experimental groups were supposed to fulfil practically the same in-class and out-of-class activities: pass summative tests; do weekly reading to participate in three course colloquiums (for control group) and in weekly SRS-supported tests and post-test discussions (for experimental group); and write an essay. For the experimental group, formative assessment was provided in the form of SRS tests –usually three tests per lecture. The learners of the two groups were given the same midterm and final tests. Average scores were included to compare overall performance of the control and experimental groups after the implementation of SRS. The data collected on the overall scores of three summative tests suggested that introduction of the SRS-supported approach helped improve academic performance of the experimental group in overall results of midterm 2 and final test whereas the control group demonstrated a decrease in overall scores.

The intervention data were supplemented by student feedback gained from a post-study paper-based questionnaire and some interviews conducted after the final test. Student answers indicated that they had an overall positive outlook regarding

the SRS approach to university lecture courses. Some participants noted initial difficulties in dealing with the SRS-supported approach. They commented on the challenging nature of weekly tests and post-test activities. However, they claimed that this approach improved their overall satisfaction with the program of study because of an innovative way of interaction in large lecture formats. There was general agreement that smart phones and tablets were the most handy and suitable devices to use in large auditoriums. Some of them commented that they now understood what the active learning approach meant in practice.

3. Discussion

The likely interpretation of the improvement in academic performance of the experimental group is that the results of regular formative SRS-supported tests based on the lecture and required reading materials helped the instructor determine what difficulties students had. It was also helpful in designing better quality questions and feedback to improve their understanding of the subject. The increase in the overall test results was encouraging, but not conclusive to show that only SRS tests were beneficial. One more reason for better academic performance is that students of the experimental group were involved in post-test activities.

Although the SRS-supported approach enabled instructors to create a collaboration environment and according to our survey results influenced our learners' academic attainment and motivation, there is still much room for improvement. First, it is necessary to introduce new formats of interactive in-class activities based on instant messaging tools because SRS provides teachers only with a one-way but instant kind of feedback support. Second, we are planning to pilot a more advanced mobile assessment system –PeLe with SRS installed as an assessment tool both for summative and formative purposes as this tool enables instructors to save test results of individuals and group dynamics, to give students opportunity to go through as many attempts as they want and to provide more test formats. Third, for creating a collaboration environment it is recommendable to analyse the impact of more common mobile social apps and instant message services for learners on their motivation and class performance and output. Fourth, another direction of further research consists in crafting questions that help students to engage more meaningfully with course content and to foster critical thinking skills.

4. Conclusions

The SRS-supported approach influenced not only lecture design –time management, the mode of material presentation, activity switch patterns– but

also learner-teacher interaction and formats of activities; from the test results data and the post-study questionnaires, it is known that they encouraged foreign language learners to produce more output in the target language, improve their intercultural competence and language skills and enhance their motivation. SRS is likely to become a supportive mobile tool for lecturers who would like to implement flipped classrooms because it enables them to transform the way of material presentation and turn a traditional lecture into an interactive lecture, then into flipped classrooms, and then, in the long run, into MOOCs.

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