Recording Mobile Learning: An Evaluation of the Number of Audio Recorders Needed in an M-Tel Study

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ABSTRACT

Data collection in M-TEL (Mobile Technology Enhanced Learning) studies is associated with great challenges, as both the learners and data collectors are mobile. One context for M-TEL is outside the controlled environment of the classroom, meaning disturbing sound and noise from the environment, which forces the research community to re-evaluate how the community collects data. This study evaluates how many audio recording devices are needed when collecting data for a subsequent qualitative analysis of an M-TEL study; in the author’s case through interaction and conversation analysis. The author analyzed how much of one learner’s speech was recorded by an audio recorder attached to that learner, and compared this with how much that learner’s speech was recorded by her peer learners’ audio recorders, as well as by a close-up video camera. This article presents a quantitative analysis of the material from different points of view: consecutive in time, the proximity of the learners, activity of the learners, a union between audio recorders, and a union between video and an audio recorder. The author’s conclusion is that in a group of learners, it is necessary to let every learner carry an audio recorder to sufficiently record their speech for later qualitative analysis.

Keywords: Data Collection, Human Computer Interaction (HCI), Mobile Learning, Mobile Technology Enhanced Learning (M-Tel), Technology Enhanced Learning (TEL)

INTRODUCTION

One of the main ideas of M-TEL (Mobile Technology Enhanced Learning) is that it can facilitate in situ learning. In this sense, M-TEL research and practice builds on situated perspectives on learning (Brown, Collins, & Duguid, 1989). The situated cognitive perspective is not exclusive to M-TEL, or even TEL, it is also a common viewpoint within HCI. But the study of M-TEL faces certain specific obstacles, such as the mobility of the learner and the mobility of the data collector (much like HCI for mobile artefacts).

In order to analyse M-TEL activities qualitatively it is common to collect data by audio and video recordings. As the learners in M-TEL are active, mobile, and often work in groups, there is a need to collect data from a number of learners. The collected data becomes vast, is time consuming to analyse thoroughly, and will include duplicates since several recorders are used. Because of the amount of data, studies can become fragmented and analysis and reporting is often done using only parts of the recorded data. There is also the risk of missing important data in the analysis. The question arises; how
can we minimize the amount of collected data? Also, is it possible to give an estimation of the value of using a particular collection technique?

The aim of this article is to investigate how many recording devices are needed to record a sufficient amount of easily audible conversation, for later qualitative data analysis, for a group of learners, when for instance studying learning and collaboration in a real life setting in an outdoor context. The analysis reported is part of a larger M-TEL field study, MULLE (Math edUcation and pLayful LEarning), where two issues were studied where the speech of the learners were important for the analysis. The first was a study of interaction design through learners’ focus on devices via interaction analysis and the task model (Eliasson, Nouri, Ramberg, & Cerratto Pargman, 2010). The second was how different pedagogies may support collaboration and learning and was studied through conversation analysis (Nouri, Eliasson, Ramberg, & Rutz, 2010). The groups of learners used a designed mobile learning tool to measure areas in a real setting (in a field), where the learners would move as a group, but would also split up in order to solve tasks. The data was collected using video, to record how they moved, and digital audio recording devices with corded microphones attached to each learner (hereafter referred to as audio recorders), to record what they said. In the case of our short study (a little more than 1 hour with two groups of three learners in the field), we collected almost seven hours of data, which took several hours per collected hour to analyse. Gathering data through audio and video recorders is a common way to collect data, posing common problems for (at least) short term M-TEL studies. This article only discusses the gathered recordings from one of the two groups with three learners in each group.

When planning the study, the hypothesis was that it would be enough to attach an audio recorder to the learner who held the main M-TEL device and record non-verbal group interaction on video in order to minimize collected data. M-TEL is often a collaborative activity, requiring occasional grouping for discussion, and we thought that all interaction of interest, vocalised recordable interaction, would be recorded on either the single audio recorder attached to the learner in charge of the main mobile device, or be recorded on the close-up video camera. We wanted to know if it would be enough to attach a recorder to just one learner, but to investigate this; we attached audio recorders to all of them.

We make three assumptions in this article. The first is that recording video and audio is a good way to record data for later interaction and conversation analysis. It has limitations, as the data is viewed and listened to out of context at a later time. This data collection method is obviously dependent on how the data will be used, but we needed a rich view of the study, and thus chose audio and video recording. The second assumption is that the data gathering session is short, which makes it feasible to use several video and audio recorders, while still not collecting an overwhelming amount of data. Our data gathering setup is not well suited for longitudinal studies as it also is very resource-intensive in terms of personnel who handle the recording equipment. Thirdly, we assume that the goal should be to record 100% of the speech of every learner, complemented with video to show activities, grouping, and the interaction between the students. If we would say that, for instance, 80% of the speech would be enough for each (or a particular) learner, we must ask ourselves, what 80%? How can we be sure that the material contributing to a thorough analysis and a well-founded conclusion is not left within the remaining 20%? Collecting rich and good qualitative data is crucial for a thorough analysis needed to inform continued future design of artefacts, as well as for coming to conclusions regarding the pedagogical value of the artefacts and activities.

RELATED WORK

Educational HCI literature provides little help on how to set up a study for mobile settings, only discussing note taking or laboratory studies. Preece, Rogers, and Sharp (2002) provide
The Significance of the Reflective Practitioner in Blended Learning
[www.igi-global.com/article/significance-reflective-practitioner-blended-learning/44680?camid=4v1a](http://www.igi-global.com/article/significance-reflective-practitioner-blended-learning/44680?camid=4v1a)

The Dialogic Nature of Meaning Making within a Hybrid Learning Space: Individual, Community, and Knowledge-Building Pedagogical Tools
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