TELEPRESENCE WITH IPADS: LEARNING AND COLLABORATION IN LOWER SECONDARY SCHOOLS

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Abstract

Distributed learning is a growing issue in education following the mainstreaming of technologies such as videoconferencing. However, though distance and distributed learning have been common in adult education and business since the 1990s little is still known about the use of videoconferencing in elementary education. This paper reports from ongoing research in three rural schools in Denmark where the use of videoconferences are used as part of the teaching at lower secondary level. The research focuses on how students learn from videoconferences that are both one-to-many and peer-to-peer. Videoconferencing, conceptualized by the schools in question as telepresence, is performed in a unique combination of desktop interaction through mobile devices (iPads) and studio-based large screen lectures and interaction. Preliminary results of the research suggest that telepresence could be enhanced in schools by seeing it as a broad framework for collaboration between schools, in which different kinds of connections – both synchronous and asynchronous, mediated and face-to-face, large screen and desktop interaction – can support the placement of schools within the community and in the global context of learning.

Introduction

In the spring of 2013 I was asked to research an ongoing school development project in a rural part of the west of Denmark, where three schools had for a year been using videoconferencing for teaching basic subjects such as maths, German, science, history and literature. The purpose of the project, which was initiated by the local municipality, was to explore how the use of videoconferences in schools could support community and curriculum developments through increased collaboration between schools, access to experts and the establishment of links between schools, industry and community. Within these broad aims the municipality sought to respond to a variety of community challenges, for instance the depopulation of specific rural areas and the consequent limited access to resources such as specialized teachers and experts. Following a municipal reform in 2007, the municipality had increased in size and incorporated several rural school districts which necessitated a local strategy for linking schools and reorganizing available resources. As a result, the municipality initiated the project and at the same time schools invested in iPads for all students in lower secondary school (age 13-16).

The research project specifically explored the potential of videoconferences as a supplement to classroom teaching for qualifying lower secondary students' learning, with the three local schools as an empirical case. Research was done as an ethnographic, multi-sited study that included observations in all three schools as well as interviews with students. Research is ongoing and the following reports from the initial phase of the project from the autumn 2013 to 2014. The project ends in the summer of 2015.

Learning through telepresence: insights from the literature

Telepresence is a broad and complex term for a variety of phenomena involving embodied, virtual presence in mediated environments (Friesen, 2014; Levinsen et al., 2012). In this paper I shall focus on videoconferences as a telepresence activity, where telepresence is understood as a way of configuring learning rather than a specific experience of being present, as suggested by phenomenological approaches to telepresence (Dolezal, 2009; Draper et al., 1998). In understanding telepresence through videoconferences as a process of configuration, I am inspired by the idea that telepresence is contingent on local practices of for instance collaboration, subject cultures and modes of instruction (Pink, 2011). In this sense telepresence is placed in local practices and entangled within these practices (Dussel, 2013; Latour, 2005). Researching telepresence therefore involves studying new ways of placing technologies in schools, as well as new ways of placing schools in the community.

According to the literature, videoconferencing can be defined as "synchronous audio and video communication through computer or telephone networks between two or more geographically dispersed sites" (Cole, Ray & Zanetis, 2004 cited in Lawson & Comber, 2010). The potential of synchronous interaction is immediate interaction with others distributed in geographical space, which may extend learners' access to high-quality learning opportunities (Berge & Clark, 2005; Barbour & Reeves, 2009). As the practice of learning through videoconferences originated in higher education and business contexts (Lawson & Comber, 2010, Falloon, 2012) the role of videoconferences in learning are still relatively unexplored in elementary schooling, though successful experiences have been made in rural schools and with home-schooled children (Barbour & Reeves, 2009; Lawson & Comber, 2010). Introducing videoconferences in lower secondary schooling will therefore require a re-conceptualization of traditional pedagogies.

Though videoconferences, according to the literature, have the potential to increase social presence, community and educational opportunities in specific local areas and for specific students, several challenges are nonetheless connected with establishing these new social arenas. Challenges may include collaboration issues such as time-table coordination, booking requirements and technical limitations (Pitcher et al., 2000; Lawson et al., 2010). In addition to this, modes of instruction such as one-to-many lecture formats may disengage young learners who are used to more enquiry based learning. In the telepresence with iPads project schools sought to meet this challenge by constituting telepresence within the unique combination of studio-based lecture-like activities and student-to-student interaction through personalized technologies (iPads). Within this conceptual matrix, telepresence unfolded as

specific configurations of videoconference activities that were meant to suit learners in the 7-9th grade.

Moving between sites – methodological issues

Because of its focus on distributed learning, the telepresence with iPads research project has been inspired by multi-sited ethnography (Marcus, 1995; Hannerz, 2003). According to Marcus and others, multi-sited ethnography has provided a methodological framework for ethnographically following things, ideas and people in global contexts where phenomena are mobile and transient. Multi-sited ethnography thus moves away from the single-sited practice of conventional ethnography and follows the circulation of objects, practices and identities across sites.

In the telepresence with iPads project multi-sited ethnography has contributed to mapping relationships between schools and studying their collaboration through telepresence. As collaboration between schools is built into the project, multi-sited ethnography has followed telepresence as a phenomenon that emerges within these collaborations, i.e. the idea is that looking at it from one locality is only seeing it partially. In the project I as the researcher for instance had to map and travel distances between schools in order to understand how distance and other kinds of (dis)connections might act in relationships between local schools. In mapping and travelling distances between schools, I had to decide, in relation to each telepresence activity, where to be physically present and how to incorporate in my observations the experiences and learning of those that were remote.

Latour argues that "… elements which are close when disconnected may be infinitely remote if their connections are analyzed; conversely, elements which would appear as infinitely distant may be close when their connections are brought back into the picture." (1996, p.4). My research therefore had to identify the complexities of these connections, in this case the multitude of ways in which connections and their distance-closeness effects could affect students' learning.

One of the ways in which distance and proximity acted in the project was through the connections made between schools and with their affiliations with the local community. All three schools, though in average 15-20 kilometres distant from each other, were as mentioned above situated in the same municipality, and in many ways shared local histories and socio-economic conditions. However, organizational differences between the schools, such as differences in time tables, teaching styles and practices, often challenged the realization of collaborative telepresence events. In addition to this, teachers and students, though all in one perspective local, were mostly strangers to each other, and had not generally been given time to meet, get acquainted and plan ahead. For many teachers, collaboration is in itself a challenge as they are used to managing classrooms on their own, and opening up the classroom through videoconferencing can be daunting. In this sense local proximity – as argued by the literature – needs additional affiliations to create trust and give access to classrooms (see for instance Friesen, 2014). What seems to be close in terms of local

placement may therefore not be sufficient to support the relationships between schools that are necessary for collaboration and learning.

Case 1: Geography through telepresence

School A is a small, rural school in the west of Denmark where the students have been working with telepresence through their iPads as well as large screens situated in the classroom dedicated to telepresence[1]. The students are working on a project in geography with school N, a larger, rural school situated about 16 kilometres away. The students in school A and school N have not met each other physically before the telepresence session, however, a few of the students know each other from communion class, leisure activities or other contexts.

School A and school N are collaborating on a geography project where Google Earth is used to tag places in different countries. According to the teacher in school A, the point of the project is to raise the students' awareness of local differences in countries like for instance Norway, USA, Belgium and Holland. Through Google Earth, he explains, students will ideally be able to identify infrastructural differences through the visual representations of local spaces in the Google Earth interface. As the project is collaborative between the schools, the tags are swapped in a kind of treasure hunt for national, geographical differences.

In the lesson I am observing, videoconferencing is used to instruct students in both schools in how to place the tags in Google Earth used for the treasure hunt. The teacher in school N is teaching the students in both schools, as the teachers have divided the tasks between them, and he is the only one who knows the functionalities of Google Earth. This means that the students in school A are obliged to address the remote teacher if they need help in understanding the assignment.

The focus of the telepresence session is, as described above, the identification and study of local/global space as a geographical phenomenon. Thus, images of the earth are projected and navigated easily by the remote teacher on the large screens covering the end of the wall that faces the students. In quick successions, students' gaze is invited to travel from a view of the Earth from out of space to a view of their local area in Denmark and then further into European locations. Students are meant to follow and replicate the remote teachers' instructions on their own PCs and iPads – which potentially adds a feeling of proximity to what is illustrated as well as draws on a student centred approach to the instruction.

However, as I shall argue below, the instruction generally fails to engage the students in school A, who for the most part very quickly become completely disengaged from the activity. This echoes the argument made by Richardson and Wilkin (2012), that the supposedly dematerializing effects of cyberspace and telepresence – in this case the projections on the screens – is always unfolded within specific, localized contexts and activities. What acts in the situation and inspires (dis)engagement is therefore, it seems, not geographical proximity or

[1] School A has a population of 214 students, School N 294 students, school T 257 students.

local affinity, but modes of attachment and instruction that keep the students from actively participating in the lesson. Thus, as the students are not familiar with the remote teacher, they fail to address him when they do not follow the instructions on the screen. As a rule, they prefer to ask their local teacher for help, but, because of the division of labour between the teachers, the teacher at school A cannot help them with the task. In addition to this, the mode of instruction and possibly the way in which school N is presented on the screen – displayed from a distance and with no eye contact with school A – disengages students from both the partner school and the subject at hand. What seems to be near in terms of geographical proximity and local identity therefore presents itself as infinitely remote in the specific context of the geography lesson observed.

Case 2: Learning German through telepresence

Case 2 consists of two separate scenarios where I observed how German was taught through telepresence in the same class in two different school years in school T, in collaboration with respectively school A and school N. In the first scenario German was taught peer-to-peer, i.e. through iPads, with FaceTime interaction between students in school T and school A. The students, who were at that time beginners in German as a foreign language, were asked to take turns with presenting themselves in German to the students in the collaborating school. This was done with the support of a piece of paper with notes that they had prepared before the lesson. In the second scenario students in school T and N were taught German adverbs one-to-many by a teacher at school N, who taught the basic grammatical principles of adverbs through a PowerPoint in a videoconference on the large screen.

Student to student interaction through telepresence

Communicating with authentic others through telepresence can support learners' communicative approach to the language and engage learners in the target language. According to Arnold, Cayley and Griffith (2002) and others, enhanced language learning is one of the significant impacts of videoconferencing. However, in language learning specifically, the anxiety of communicating with native speakers or strangers in the novel environment may intervene with the students' ability to profit from the synchronous event (Kinginger, 1998).

In the first scenario FaceTime interaction was, as mentioned above, chosen as a framework for the task, as new learners of a foreign language often are reluctant to speak up in a plenary session where strangers are present. One of the principles underlying the use of interaction through the tablet screen was therefore to create a feeling of equity and proximity between the students. This was done both through the choice of subject – a presentation (in German) of the students' families and near relations – and through the pedagogical set-up which was student-to-student interaction through the small screen of the iPad. The iPad is arguably a more intimate platform for videoconferencing, as the iPad is a personal device and supports a close up view of communication partners.

Though the videoconference setting itself is a more intimate scenario than the geography lesson described above, issues of connectedness still affected the interaction of students in the learning process. As students in the two schools did not as a rule know each other and were not used to collaborating, interaction never became natural or fluent, and students generally clung to their pre-prepared manuscripts, transforming the situation into a shared reading event rather than a conversation. As interaction was generally based on transmission of information, a number of the students increasingly became unfocused and dissociated from the task in the course of the lesson. In addition to this the unfamiliarity of students with this way of learning the language affected their behaviour in the situation, which according to the teachers was to a large extent disruptive and lacked (n)etiquette.

Teacher to student instruction through telepresence

In the second scenario teaching German grammar one-to-many became a practice of language learning that contributed to shaping the experience of videoconferencing as a learning event. Contrary to the practice of speaking a foreign language, learning German grammar was configured as a big screen one-to-many learning event, where students in both schools were moved to an auditorium-like classroom and situated in rows. In this session the teacher from school N taught the principles of adverbial connections through a PowerPoint presentation on the screen. The teacher at school T was present as an assistant teacher to her own class. The lesson was, I was told by the teacher, a relatively classic enactment of a grammar session, where an aspect of the lesson was to try to experiment with the relationship between students in school T and their relationship to the teachers in respectively school T and N. The question was whether students would feel confident with addressing the remote teacher in German in the course of the lesson. As remote participants in the grammar lesson, students were at the outset placed as spectators to the presentation given by the remote teacher. However, after her presentation students in school T were invited to participate in the discussion of translations of Danish sentences into German. In this context the students were extremely reluctant to address the remote teacher and to speak out in the plenary in German. As a rule, students addressed their local teacher, and spoke out to her, though she was purposely seated at the row behind them. In the evaluation after the session, students generally said that they had enjoyed the lesson as a break from classroom based teaching, and that they felt the remote teacher had presented the grammatical issues clearly. However, they all felt uncomfortable with speaking out in the plenary, as students in school N were strangers to them and they were afraid of making mistakes in the plenary. In this sense they were primarily placed in the telepresence event as spectators, and chose to act within their local configuration of teacher-student relationships.

Discussion and some conclusions

The scenarios above illustrate some of the challenges, issues and potentials involved in connecting schools through telepresence understood as different kinds of mediated practices in everyday schooling. Whereas videoconferencing – according to the literature – has extensive potential for redistributing learning resources in rural communities and enriching

learning – actually making the connection(s) is, as the examples show, still affected by both logistics and issues of proximity and distance. In terms of logistics, the schools in question must – as shown above – aim to adapt their organizational and cultural specificities to the community of schools with regard to for instance timetables and teaching styles. When this adaptation is successful, three school organizations may to some extent become one and can act as one in the synchronous learning environment. What works against this, however, are not only organizational structures in the individual schools, but also the lack of familiarity and feeling of community between students and teachers who are in many senses effectively strangers inhabiting the same local municipality. Therefore, connections between students and teachers in the schools must in future be supported and enhanced in order to establish engaging learning forms in the mediated environment that can create this feeling of community.

Another issue that acts in the telepresence with iPads activities is the co-presence of several teachers and learners in restricted synchronous learning environments. As argued by the literature, synchronous interaction can be an extremely challenging framework for learning in terms of both logistics and effectively making the connections that support interactive learning practices (see for instance Anderson & Rourke 2005). This is an aspect of videoconferencing that schools should address and take seriously in their development of telepresence activities. In the schools in question, one of the challenges identified by the research is exactly these brief and fragile synchronous learning spaces that to a large extent fail to connect distributed students and teachers. Therefore, the synchronous activities in these schools might be enhanced by extending and supporting them through asynchronous and face-to-face activities that could establish a more solid and meaningful basis for collaboration by bringing real connectivity back into the picture. This will entail looking at collaboration – and telepresence – as a broad framework for learning between the schools, in which different kinds of connections – both synchronous and asynchronous, mediated and face-to-face, large screen and desktop interaction, can support the placement of schools within the community and in the global context of learning. One of the exciting aspects of telepresence is thus the ways in which the potential of mediation changes the directions of learning – i.e. brings them out of the brick and mortar environment and into communities that are both global and local and in which collaboration is directed at real world communities. One of the interesting issues to be taken up by the research described in this paper will therefore be a further study of the consequences of these new directions and connections of learning, i.e. how a deeper study of these connections between schools and communities can bring more learning potentials into the picture.

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