USE OF TELEPRESENCE EQUIPMENT FOR TEACHERS' PROFESSIONAL DEVELOPMENT

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Abstract

In the framework of the IRIS project, telepresence system is used to provide better educational and study opportunities to students living in geographically isolated areas of the Danube Delta in Romania. The study refocuses teachers' attention to the quality of interactions as the key issue of facilitating learning, by using video recorded teaching activities. This research is grounded on identifying adults and teenagers' resistance and openness to adopt new technology. Telepresence is investigated as challenging context for teachers' professional development by switching the primary focus from virtual environments back to traditional educational settings. Using videography data as input and a motivational driver, researchers involve teachers into an action research collaborative effort, focusing on interactions as a catalyst of quality teaching. This paper presents the design of a teacher training program that extensively uses videography materials as a platform for understanding social interactions in the classroom, as part of the learning process. The program's design embodies the "triple A model", bringing both teachers and students into the process of awareness, acknowledgement and accomplishment of their experiences in classroom.

Keywords: Telepresence, behavior research, classroom interactions, visual analysis, videography

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1. Introduction

The most recent Unesco, report "Education for All 2015 National Review Report Romania" shows that equity and equal educational opportunities represent critical issues in the public agenda nowadays. On the one hand, previous years have shown that the quality of education has worsened in Romania. According to the Eurostat report from March 2016, the country had the third-highest dropout rate in the EU last year, exceeded only by Spain and Malta. Eurydice (2015) Education and Training monitor and EUROSTAT (2016) data on Romania illustrate increased dropout rate from 17.3% in 2013 to 18.1% in 2014, and 19.1% in 2015. On the other hand, PISA 2012 shows negative results about Romanian education and quality of school life, including attitude towards learning and quality of relationships between teachers and students (OECD, 2014). The OECD Study (2014) showed that the 14- and 15-year-old students do not have a sense of belonging to their school. Compared to international data, Romanian students' perceptions about school are critical. Poor relationships between students and teachers place Romania in the 66th place, among 68 countries. Similar very low levels are reflected by the fact that students do not care about their academic outcomes. The attitude about the content of learning places Romanian students in the last place in the international ranking. Briefly, the students seem to value neither academic outcomes nor what they learn in schools. Romanian teenagers appear to have very low motivation and they do not feel connected to their teachers and school, as a desirable community. It is expected that negative emotions about school or feeling disconnected to one's own learning process will strongly impact in the long term on individuals' studies in the future and their professional paths.

IRIS - Adoption And Impact Of Video Technologies In Education And Local Administration represents an interdisciplinary project implemented in Romania since December 2014. The project aims at using telepresence video technology to provide distance education services in three communities isolated from a geographical point of view and at assessing the impact at the community level. Built on a strong interdisciplinary platform, the project connects technology of information and communication, psychology, education sciences and behavior economics. More specifically, the project enhances the initial educational activities for 7th and 8th grade students and offers life long learning services for adults in the community (including in-service teacher training for schools and local administration staff).

The use of telepresence was smoothly adopted by students and teachers from the three schools involved in the project. The analysis of the preliminary data on the implementation of the telepresence system raised major questions about the quality of teaching, learning and

social interactions between individuals. Researchers switched their main focus from the use of technology to the analysis of interactions between students and teachers in order to enhance the quality of teaching and learning. From the methodological point of view, visual data represents the key element of the study. Researchers used video-recorded materials, as naturally occurring data produced by regular teaching and learning activities in telepresence contexts in June 2016.

2. Problem Statement

In the Education and Training Monitor (2015), digital skills represent one of the key competencies in EU countries. Wastiau et al. (2013) and Livingstone (2012) launch challenging questions about ICT as a tool for enhancing learning, which need a different pedagogy at the classroom level. Fu (2013) pointed out the importance of teachers' attitudes, perceptions, and confidence in using ICT and the school culture while Ellis & Loveless (2013) demonstrated the need to tailor the curriculum, pedagogy and technologies in order to set up effective learning environments.

Monitoring IRIS's activities highlighted the idea that the use of new technology can narrow the perspective on technical aspects of the instructional process. As an effect, it is possible to underestimate the focus on the quality of learning and teacher-student interactions. The first stage of a comprehensive study aiming at analyzing reactions and behaviors that are connected to adoption of new technologies (carried out by multidisciplinary teams) revealed two challenging issues. On one hand, the focus on technology brings new dimensions of teacher-student interaction analysis. At another hand, classroom observations from students and teachers' perspectives highlight critical incidents and rich authentic resources, which can be converted into critical reflection materials which can lead to a constructive approach empowering all social actors involved.

3. Research Questions

Researchers switched their initial focus on the use of telepresence technology in teaching to the analysis of interactions between students and teachers in order to enhance the quality of teaching and learning. The main research question "How to convert teachers' interest in telepresence into a new challenging approach to create a richer opportunity for enhancing reflection on their own teaching in both traditional face-to-face and virtual environments?" oriented educational researchers to design a teacher training program.

4. Purpose of the Study

IRIS implements telepresence in three remote Romanian communities (Crisan, Mila 23 and Mahmudia) to increase access to quality education for secondary school students. The study refocuses teachers' attention to quality of interactions as the key issue in facilitating learning, starting from telepresence experience back to traditional teaching in real classrooms. The initial purpose of the study was to explore the perceptions of teachers and students on telepresence, which is a new concept within the Romanian educational context. Data collection process revealed telepresence as a "neutral" issue which can bring together students and teachers' perspectives on a shared experiential learning. Teaching and learning can be interpreted and re-interpreted in a multi-layered way, starting from the video-taped materials. By using video materials, both 14-15 year old students and teachers can change the instructional approach into a constructivist approach, which is beneficial for both parties.

5. Research methods

Data collection required both qualitative and quantitative methods (questionnaires before and after use of telepresence for 80 students and 20 teachers), focus group interviews (12 teachers, 20 students), individual interviews and classroom extensive observations from October 2015 till June 2016. Video-recorded educational activities were analyzed using Media Recorder3 and ObserverXT12 software. Interpretative instrumental case study (Stake, 1995) methodology was used to document teachers' activities and reflection on implementing the telepresence system.

The use of visual research methods is supported by recent developments within the social sciences field, where it is becoming increasingly widespread (Margolis & Pauwels 2011). It is also grounded on the previous experience of the research team. Working with a group of early education practitioners (Stîngu, Ulrich, & Vrăsmaş, 2015) the study highlighted that using visual materials for reflective practice presents a highly effective platform for professional development. The use of the CARE (Child-Adult-Relationship Experimental) Index tool for children and adult interactions in early education settings influenced the concept about alternative ways of designing and implementing professional development. It addressed questions like "How are social processes organized?", "How do pattern variations occur over time in the classroom?", "What is the role of emotions in classroom social life?" or "How do negative and positive emotions influence teachers' ability to deal with group management issues?". The use of children's drawings and Photo voice focused attention on children's perspectives and biographical dimensions of personal and interpersonal experience in school settings (Ulrich, 2008).

On one hand, teachers need ownership and psychological comfort in order to critically address issues related to own practice. On the other, researchers need non-intrusive and inspiring opportunities to develop a three-step approach to teachers' professional development, from awareness, to acknowledgement and achievement (also known as the Triple A model).

6. Findings

Telepresence is a new concept for students and teachers in Romania. No explicit resistance to implementing such technology change is evident. Data collected through questionnaires and focus group interviews reflected neutral and rather laconic comments in regard to instructional approach and surprisingly neutral comments related to personal experience activated by the new technological approach.

Initial observations of telepresence teaching activities for the 22 8th grade students highlighted the following: both teachers (of Romanian language and Math) use almost 85% their teaching time for direct instruction; their focus was mainly on students being active during lesson (average 25% of the group); teachers did not pay explicit attention to classroom management problems; students had interventions about correcting disruptive behaviors in the classroom when the noise level was unbearable; and they activated humor in giving answers not related to the instructional tasks. Half of the group of students exhibit off-tasks behaviors (they do something else other than that required by teachers, they move around in the class and interact with their peers on non-academic topics, eat, joke with each other, put their head on the desk, etc.).

Researchers decided to find ways to encourage deeper reflection, both for students and teachers. Video-recorded materials were used as common platform to observe, analyze, interpret and (on a longer term) change behavior and expectations about the teaching and learning experience. Amongst the video-recorded materials, researchers selected two activities, based on certain criteria: to reflect key elements of IRIS interventions (support teaching and learning activities for math and Romanian language); to be recorded when both teachers and students are comfortable enough in interactions (5 previous activities had already taken place); to provide rich recorded data from teachers and students' perspectives and to accurately reflect the settings (technical standards about light, sound, distance, quality of the image etc.).

Within the multidisciplinary team, discussions focused on the analytical and technological demands on shooting the videos. Educational researchers narrowed down analytical frame, taking an educational perspective on social interaction. Based on preliminary data analysis, the researchers developed a framework that represented the axis for future

teacher training programs, using the Triple A model (awareness, acknowledgement and achievement).

In order to raise awareness, researchers developed the first phase when, together with the teachers, they analysed the video recorded activities of telepresence teaching. Researchers used the following questions to help teachers reflect upon their practice. These were not validated for reliability, just used as tools for reflection.

- Select the best moment (1-3 minutes) of this teaching experience.
- What makes it the best, for you, as a teacher?
- Think about the students involved. What does it make it best, for your students?
- We watched this teaching episode together (could be 10-20 min of the recorded lesson).What do you see (if needed, guided observation on facial expressions, body postures, gestures, glances, movements, etc.). What do you hear?
- How do you see yourself in this context/ interaction?
- How do you feel? What makes you feel good about this experience? What makes you feel bad? Why do you think this (specific aspect) makes you feel that way?
- What do you think can be changed? Why do you consider it as a necessary change?
- How can we work together on making such a change? How can we involve the students?

For the same stage of raising awareness, researchers had workshops with students, where they conducted guided observations and focus group interviews. Researchers used questions corresponding to those used for teachers:

- Select the best moment of this learning experience.
- What makes it the best, for you, as a student?
- Think about your colleagues in the classroom.
- We watched this teaching episode together (according to students' capacity to observe and interpret, could be screen shots of captured moments or 5-10 minutes of the recorded lesson).
- What do you see (if needed, guided observation on students behavior, types of interactions, use of time, etc.)? What do you hear?
- How do you see yourself in this context/ interaction?
- How do you feel? What makes you feel good about this experience? What makes you feel bad? Why do you think this (specific aspect) makes you feel like that?
- What do you think can be changed? Why do you consider it as a necessary change?

- How can we work together on making such a change?

The Acknowledgement phase included discussions on the key ideas raised in phase one. In addition to the video recorded materials on telepresence experience, researchers and teachers used video recorded materials of regular face-to-face teaching (according to time, distance and availability of other resources). Similar questions as in phase one were used both for teachers and students. Researchers facilitated critical discussions with teachers using the results of students' guided observation and focus group interviews. Important input was provided by the answers given by teachers and students to the questions "What do you think can be changed?" "Why do you consider it as a necessary change?" and "How can we work together on making such a change?".

The Achievement phase involved teachers working with the researchers in developing plans for enhancing teaching and interactions with students and a collaborative project with other teachers in school. Reflection on the practice requires not only interpretation, but also setting up desirable changes (Stîngu, Ulrich, & Vrăsmaş 2015). Teachers compared instructional, interactional, emotional and social aspects of teaching and learning cases. They shared conclusions and lessons learned with other colleagues and also on the teacher professional development platforms.

Observation and recording social interaction in classroom, for both regular or telepresence teaching contexts facilitates the exploitation of the data to generate major details about participation frameworks, interactional space, engagement and motivation for situated learning in school. From a socio-cultural perspective, the use of visual data can empower social actors to understand themselves and interpret social interactions emerging in educational settings. From a technical point of view, using multiple video sources documenting the same scene can be effective in order to allow a more detailed analysis of sequential organisation of teaching and learning practice from an interactional, social and emotional point of view (Margolis & Pauwels, 2011). Both for the teachers and students involved, working with video materials is not only about seeing what is "recorded", but also developing a cognitive-socio-emotional construction of visual data.

7. Conclusions

IRIS promotes telepresence as cost-effective and efficient tool for enhancing disadvantaged communities' development through education. The expected benefit of telepresence consists of positive effects in academic performances of secondary school students from remote areas. However, the poor quality of interactions between teacher and students can undermine the positive expected results of the teaching activities.

This research has highlighted a strong unexpected effect that, using classroom recorded data, video materials can be effectively used as a resourceful tool for in-service and preservice teacher training. Using telepresence stimulates teachers' professional reflection: it supports students' academic and social skills and it stimulates better understanding of traditional teaching, given the direct focus on students-teacher interactions. Videography can also stimulate students' insights about their own engagement, motivation, self-regulation behaviors, social and emotional skills.

Acknowledgements

References

Adalgeirsson, S. O., & Breazeal, C. (2010). MeBot: a robotic platform for socially embodied presence. Proceedings of the 5th ACM/IEEE international conference on Human-robot interaction. 15-22. IEEE Press. 63-74. https://doi.org/10.1145/1734454.1734467

Ellis, V., & Loveless, A. (2013). *ICT, pedagogy and the curriculum: Subject to change*. Routledge. https://doi.org/10.4324/9780203468258

Eurostat: Europe 2020 indicators – education, *Data from March 2016. Most recent data: Further Eurostat information.*

Eurydice. (2015). Education and Training monitor. Eurydice Publications.

Fu, J. S. (2013). ICT in Education: A Critical Literature Review and Its Implications. *International Journal of Education and Development using Information and Communication Technology, 9*(1), 112-125.

Knoblauch, H., & Tuma, R. (2011). Videography: An Interpretative Approach to Video-Recorded Micro- Social Interaction. In *Handbook of Visual Research Methods* (pp. 414-440). SAGE.

Knoblauch, H., Baer, A., Laurier, E., Petschke, S., & Schnettler, B. (2008). Visual Analysis. New Developments in the Interpretative Analysis of Video and Photography. *Forum: Qualitative Social Research*, *9*(3). Art.14. https://doi.org/10.4135/9781446268278.n22

Livingstone, S. (2012). Critical reflections on the benefits of ICT in education. *Oxford Review Of Education, 38*(1), 9-24. https://doi.org/10.1080/03054985.2011.577938

Margolis, E., & Pauwels, L. (Eds.) (2011). *Handbook of Visual Research Methods.* SAGE. https://doi.org/10.4135/9781446268278

OECD (2014), *PISA 2012 Results: What Students Know and Can Do (Volume I, Revised edition, February 2014): Student Performance in Mathematics, Reading and Science*, OECD Publishing, Paris. https://doi.org/10.1787/9789264208780-en

Sheppard, G. R., & Walker, P. J. (1999)**.** Telepresence. The Future of Telephony. Boston: Kluwer Academic Publishers. Analysis of Video and Photography. *Forum: Qualitative Social Research*, *9*(3). https://doi.org/10.1007/978-1-4615-5291-8

Stake, R. E. (1995). The art of case study research. Thousand Oaks, CA: SAGE Publications. http://iris.fpse.unibuc.ro/retrieved 15th of June 2016.

Stîngu, M., Ulrich, C., & Vrăsmaş, E. (2015). Using Reflective Practice to Enhance Professional Development Through Written, Spoken and Visual Materials. The 6th International Conference Edu World 2014 "Education Facing Contemporary World Issues", 7th - 9th November 2014. *Procedia-Social and Behavioral Sciences*, 2015. 1207-1214. https://doi.org/10.1016/j.sbspro.2015.02.247

Ulrich, C. (2008). School through children's eyes: representations of the daily school life for 6-8 year old pupils. REPERE nr. 1/ 2008 Bucharest University Press. 210-229.

Unesco (2015). Education for All 2015 National Review Report: Romania. retrieved from http://unesdoc.unesco.org/images/0023/002303/230309e.pdf

Wastiau, P., Blamire, R., Kearney, C., Quittre, V., Van de Gaer, E., & Monseur, C. (2013), The Use of ICT in Education: a survey of schools in Europe. *European Journal of Education, 48*, 11–27. https://doi.org/10.1111/ejed.12020