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Interaction and Effectiveness - Theoretical Approaches in a Teleconference Environment

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Abstract: As 21st century learners, teleconferencing is a tool for modern tele-learning which allows learners and trainers who are at two or more remote locations not only to exchange views or to share data but to actively participate in a dynamic interactive environment, the main feature of which is the collaborative building of knowledge from a distance, in real time. Teleconferencing is a tool that can help provide quality teaching and learning. It creates opportunities for cooperative learning processes with interaction while incorporating all its functions. The purpose of this paper is to present the theoretical approaches of efficacy as they can be used with the concepts of interaction and efficiency in the contemporary teleconferencing environment.

Keywords: Interaction, Effectiveness, Teleconference

Introduction

According to Keegan's (2001) definition, the term distance education characterizes the educational process that takes place "outside the walls" of a conventional classroom, where the teacher and the learner are geographically distant supported by appropriate technical tools that facilitate the teaching process and the transmission of learning content (Tsatsaki & Veneri, 2009). Distance learning with the use of new technologies and media, particularly via network technologies and the Internet is distinguished as either synchronous or asynchronous or both. The synchronous model requires the simultaneous participation of all trainers and trainees, even if they are in different locations. Synchronous telelearning is considered to be advantageous in terms of real-time communication and exchange of ideas, offering an environment closer to the traditional classroom environment and allowing immediate feedback (Karal, Ayça & Yigit, 2011). Modern tele-conferencing systems can be used to create e-learning environments that allow direct communication between the participants and support important aspects of the teaching process such as face-to-face interaction, dialogue and cooperative activities (Mouzakis, Balaouras, Roussakis & Mathaiou, 2004). Teleconferencing under pedagogical conditions helps to contribute in improving the communication and interaction environment between teachers and learners (Karagianni, Stauropoulou & Karatrantou, 2010). The aim of this paper is to present the theoretical approaches to the concepts of interaction and effectiveness in a modern teleconferencing environment and to explore their integration within a framework of complete educational design.

Teleconferencing

Teleconferencing refers to real-time communication via audio, live video and data (files, presentations, graphics, etc.) between two or more remote locations (Alexander, Higgison & Mogey, 1999; Suthers, 2001; Becta, 2003; Panagiotakopoulos, Lionarakis & Xenos, 2003; Anastasiadis, 2007; Israel, Knowlton, Griswold & Rowland, 2009; Karagianni et al., 2010; Anastasiadis et al., 2012). Audio and video transfer is achieved by the transmission- reception of compressed video-audio signal (streaming video-audio) using appropriate software (Panagiotakopoulos et al., 2003). We can approach the term teleconferencing through both technological and methodological terms. In relation to the technological aspect, the term teleconference refers to the possibilities of its use. Regarding the methodological point of view the term is related to the creation of two or more learning environments where users communicate, exchange data, files, presentations, graphics and common applications that are shared (Panagiotakopoulos et al., 2003; Kotopouli, Mpasmatzidis, Koutli & Kasidaki, 2007; Armakolas, Panagiotakopoulos & Fragoulis, 2014; Sofos, Kostas & Parasxou, 2015).

The effectiveness of teleconferencing

The continuous upgrading of video and sound transmission technologies, the development of teleconferencing systems and the development of broadband networks significantly improve the

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technological conditions for the organization of educational teleconferences (Anastasiadis, 2007). The technological mediation that takes place in a teleconference greatly alters the way in which teaching is conducted and affects important aspects of its design, organization and implementation. At the same time, it requires teachers and learners to adopt new roles and acquire additional skills. In this sense, designing an educational teleconference is particularly demanding in relation to traditional face-to-face teaching (Heath, Holznagel, Deford & Dimock, 2002; Becta, 2003; Anastasiadis, 2007; Karagianni et al., 2010; Armakolas, Panagiotakopoulos & Vasilopoulou, 2014). The teaching methodology should create the necessary conditions for the active participation of the learner in a process where they will be able to process the information critically and transform it into knowledge (Anastasiadis, 2007). Nguyen (2015), based on research, states that distance learning through teleconferencing is at least the same or even more effective than traditional learning methods.

Therefore, a wide range of indicators and variables of pedagogical and technological nature are used for the exploration of effectiveness, as the learning process involves factors such as the nature of the subject, the teaching objectives, the teacher, the methodology of teaching, the characteristics of the students, the number of rooms, the technological equipment of the teaching halls and the reliability of the communication network (Mouzakis et al., 2004). There are certain conditions necessary for a teleconference to be successful. These are: (a) the selection of participants, (b) careful pre-conference teleconferencing planning. This should include well structured teaching content, a joint trainer-trainees preparation about "rules of engagement" for their role in teleconferencing in terms of behavior, communication, listening and participation, (c) appropriate procedures for addressing technical issues including: familiarization with teleconferencing equipment, participation in trial teleconferencing before the main teleconference call, equipment testing and platform utilization. Technically speaking they include: i) technical tests before the teleconference to ensure that the technology is reliable and to ensure that all participants and instructors can effectively use the equipment, (ii) planning activities in the room to facilitate interaction between participants and trainers in order to reduce the perceived distance between the distant points. It is important to acquire know-how and technical support in case of problems arising during a teleconference. On the part of the participants a positive attitude and greater self-efficacy is achieved (Cavanaugh, Milkovich & Tang 2000; Lawson & Comber 2014). In this case, student satisfaction is considered a factor of effectiveness (Heath, Holznagel, Deford & Dimock, 2002). The effectiveness of the teleconference, is in relation with the preparation of both teacher and learners. Moreover, it depends on the teachers' flexibility over the learners' special characteristics, the targeted teaching and the use of experiential techniques to maximize the interaction between them and between them and the teacher (Armakolas, Panagiotakopoulos, Karatrntou, 2018).

Interaction in teleconferencing environment

Compared to other distance learning methods, teleconferencing has promising benefits in terms of real-time interaction, immediacy, motivation and cooperative learning (Gillies, 2008). A high level of interaction between learners and between learners and educators has proven to be very important for improving learning. Teleconferencing allows trainers to actively participate in a dynamic interaction environment, the main feature of which is the collaborative building of knowledge from a distance, in real time (Bernard & Cayrol 2001; Anastasiadis, 2007; Karagianni et al., 2010, Anastasiadis et al., 2012; Armakolas et al., 2014). Interaction is a key factor in this use of the technology to support a more social learning environment exchanging notions through interaction with peers over distance and to create a sense of community that uses technology in a team spirit (Heath et.al. 2002; Greenberg & Colbert, 2004).

In a teleconferencing based learning environment, connections in modern teleconferencing environments between trainer and learner provide opportunities to develop a high level of interaction (Alqurashi, 2017). Learners may ask questions, work in groups, interact at the same time, gain access to primary sources of information, combine electronic communication tools, to discuss and compare. Interaction must be planned and continuously promoted by the trainer (Armakolas et al., 2014). Moore (1989) distinguishes three types of interaction:

A) Learner – Content interaction: The first type of interaction, according to Moore (1989), is the interaction between the learner and the teaching material or subject of study. The Bernard et al. (2009) add that learning-content interaction involves the development of mental and physical skills while Alqurashi (2017) states that it is the type of interaction that indicates the interaction of learners with the learning material in order to learn or study. Learner- content interaction may include: reading informative texts, using study guides, watching educational videos, interacting with multimedia, using simulations, using educational software, as well as searching for information and completing assignments (Moore, 1989; Bernard et al., 2009; Abrami et al., 2011; Alqurashi, 2017). It may also

include the learners' thoughts about the ideas, the information and knowledge they received during the course. Developing and enhancing the interaction between learners and educational material should be a key objective for trainers in teleconferencing.

B) Learner-Instructor Interaction: The second type of interaction, which is considered essential and highly desirable by many teachers and learners (Moore, 1989; Gunawardena 1999; Su et al., 2005; Mauroeidis, Gkiosos & Koutsoumpa, 2014), is the interaction that traditionally focuses on the didactic dialogue between learners and the trainer (Bernard et al., 2009; Abrami et al., 2011). In this interaction the teacher seeks to provide support, guidance and assistance to each learner according to his/her needs, stimulate or maintain interest in what is to be taught, motivate, support and encourage active participation of the learner in the educational process, strengthen and maintain their interest in autonomous learning and self-motivation (Moore, 1989; Bernard et al., 2009; Abrami et al., 2011; Alqurashi, 2017).

C) Learner-Learner Interaction: The third type of interaction is the best form of feedback of knowledge (Tsatsaki & Veneri, 2009) and refers to the interaction between one learner and other learners, individually or in groups, with or without the presence of the trainer (Moore, 1989; Gunawardena, 1999; Su et al., 2005; Bernard et al., 2009; Abrami et al., 2011; Alqurashi, 2017). The interaction between learners is the exchange of ideas, information and dialogue that arises among learners in relation to educational planning, whether it happens in a structured or unstructured way (Mauroeidis, et al., 2014; Danesh, Bailey & Whisenand, 2015). This type of interaction provides learners the opportunity to, share experiences, information, ideas, and give and receive feedback by learning from one another (Alqurashi, 2017).

Recent research indicates that the addition of high-tech communications systems requires the capture of an additional type of interaction: learner- interface interaction. The interface refers to specific technologies, platforms and applications that students need to use in order to interact with the learning content, instructors and other learners on- line and in other distance learning situations (Swan, 2003). This type of interaction was suggested because the interaction between learner and technology is an important factor in the learning process (Gunawardena, 1999; Su, Bonk, Magjuka, Liu & Lee, 2005; Mauroeidis, et al., 2014; Danesh, Bailey & Whisenand, 2015). Instructors and learners need to interact with technology and handle interfaces in order to be able to communicate with each other (Gunawardena, 1999). Garrison and Anderson (2003), in order to include modern technological developments also used the concept of "medium", which is the material with which the learner interacts. The medium may have the traditional form of the printed material or include "synchronous" and "asynchronous" means of telelearning, such as a teleconference tool or a communication forum. So, they formulated a more complete model comprising six forms of interaction: (a) interaction between student and teacher (b) student-student interaction (c) student-content interaction (d) teacher- teacher interaction (e) teacher- content interaction (f) content-content interaction (Panagiotidou & Zisi, 2015).

Smyth (2005) attempted to develop a conceptual framework to determine which types of interactions could be properly programmed using teleconferencing. His intention is to present the framework and to indicate opportunities for future research and not to present a well-established practice. The types of interaction, according to Smyth (2005), are: i) One – to – many, in single or multipoint link. This form of interaction necessarily limits the scope and variety of strategies a teacher could plan because his focus is similar to a traditional teaching, ii) One-to- one in single point link. This form of interaction fits into many teaching purposes, iii) One – to – some, in single or multipoint links. Even though the descriptive type for this form appears to imply similar constraints to the one-to-many type, this form has more features aligned with the constructivism notions of pedagogy, iv) Some- to- some, in a multipoint link. This form of interaction represents the great potential of constructive, autonomous, learner-centered learning, because there are no limits on learners who begin interaction to enhance their own learning. Smyth (2005) explored some potentials of teleconferencing as a tool that is able to enhance teaching and expand traditional approaches beyond one-to-many delivery of content towards student-to-student engagement in learning.

Discussion

Lawson & Comber (2014) report that teachers who used the teleconference for some time, were excited about the educational dynamics listing a number of benefits for learners. These include: motivation, engagement in learning, knowledge of the subject and understanding, memorization of information, self-confidence, social and communication skills, knowledge and development of multicultural relationships. They also point out that interaction is essential. Teleconferencing supports much greater interaction from many asynchronous technologies and an effective teleconferencing based teaching, should be designed to take advantage of this possibility. Also when used properly, teleconferencing is a cost-effective way for educational institutions to provide successful educational experiences in a large number of learners.

As a teaching tool, teleconferencing with the use of technology increases learning motivation, provides the ability to practice and improve communication and presentation skills, enhances the development of research activities, and facilitates collaboration while allowing access to primary sources of content (Hazel, 1999; Milioritsas & Georgiadi, 2009). It also provides psychological support and encouragement, that is required in distance learning. With its proper design it can meet the needs and expectations of the team by using techniques and methods of active involvement of the participants, exploring their needs and meeting new needs emerging during the learning process.

Furthemore, using teleconferencing to improve teaching and learning has shifted from marginal activity to an important tool for enhancing teaching and learning (Lawson & Comber, 2014). Teleconferencing can be considered as an extremely useful tool when combined with strong, well-designed, student-centered learning (Greenberg & Colbert, 2004). The role of the instructor becomes more demanding and he is the regulator of the medium according to the conditions required. With teleconference in teaching, cooperation is facilitated, while is noted that it enriches the experience of distance learning, reducing the feeling of isolation, stimulating the encouragement of interaction and enhancing motivation for learning and communication.

The major advantage offered by teleconferencing is the wide range of interaction that may take place among the participants (Panagiotakopoulos et al., 2003). Thus, the support for both didactic and social interaction between groups is essential to create a better and more effective learning environment through teleconferencing (Kasselidis & Politis, 2006; Panagiotakopoulos, Tsiatsos, Lionarakis, Tzanakos, 2013; Armakolas, Panagiotakopoulos, Karatrntou, 2018). Carefully examining the literature according to the research of the efficacy as a result of the interaction in teleconferencing environments, we have come to the conclusion that the interaction between learner-content, learner-instructor and learner –learner has an executive role (Danesh, Bailey, & Whisenand, 2015).

Conclusion

The aim of this paper is to present the theoretical approaches to the concepts of interaction and effectiveness in a modern teleconferencing environment and to investigate their integration into a framework of integrated educational design. Distance learning through teleconference provides an appropriate learning environment for the learner to achieve high learning outcomes. Of course, the way of designing and constructing an educational module as well as in any form of education plays an important role. Opportunities are being developed, especially those that seem to be related to satisfaction and interaction. According to this, the results of the research study shows that the most powerful variable for efficacy is interaction. As the teacher focuses on the three axes (learner content interaction – learner-instructor interaction – learner-learner interaction) there is a greater chance that the trainees will be satisfied with the teleconference environment as a whole and therefore the educational results for learners are the ones the teacher desires. So, if all of the above are implemented another effective form of education in a safe environment should be evident. The instructor should their lesson taking into account all the factors discussed above. The same applies to the designer or manager of an educational platform that is to provide and exploit all the possibilities that technology allows in today´s 21st century world. As Moore (1989) mentions, teachers should work to ensure the maximum effectiveness of each type of interaction and ensure that they provide the kind of interaction that best fits both their learning goals and learners at different stages of development.

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