

The Pedagogical Framework of Interaction in Online Learning

Spyridon Kioulanis, (PhD, Post-Doc, M.B.A, M.ed, M.Sc) Director of the
Directorate of Secondary Education in Drama, Greece

spiros@kioulanis.gr

Anastasia Panagiotidou, (P.hD, Post-Doc. St. M.ed) School Advisor

sym06-dra@sch.gr

Nikolaos Kioulanis, Computing St. University of East London

kioulanisnikos@gmail.com

Abstract

This thesis examines the pedagogical context of interaction in online learning. The basic idea starts from the assumption that in the modern era virtual learning environments (VLE) are comprised of specially designed information environments in which learners do not simply play an active role but they are also essential factors in the configuration of virtual space with a view to its emergence in a social area that promotes cooperative learning through a variety of learning activities. These elements highlight the need for developing collaborative educational environments based on a specific pedagogical framework that will impact on the content, organization of studies and the technological infrastructure to be used.

1. Pedagogical framework

The pedagogical dimension of Virtual Learning Environments is based primarily on the theoretical model of constructivism (Μικρόπουλος κ.συν., 2011), with a key feature that there is a shift from teaching to learning within an environment of collaboration and interaction (Αναστασιάδης, 2006). Similar considerations also come from the area of cognitive theories and theories of social interaction, the Distributed Cognition theory (Solomon, 1987), and the theory of activity (Engestrom, 1987 , 1999).

Among the principles that should govern an online learning environment based on the proposed methodology of the American Association for Distance Learning (ADEC, 2013), interaction is emerging as a process of importance in the sense that it enhances collaborative learning, learning by doing, learning by reflection, case-based learning, and learning by exploring (Αναστασιάδης 2006).

Mason & Bacsich, (1998) report that the magnitude of the success of an online learning environment depends to a large extent on encouraging and supporting the active participation and interaction of the participating members. As they come in contact, they engage in a network of relationships that combines common activities and social interaction. As a result, the community combines individuals who have something in common, interacting in a real space or through a shared identity.

2. The Interaction in Online Learning

An important element of modern online learning environments is their transformation into collaborative environments and intensive social processes. In order to be developed an online learning environment, a combination of interactions is required through which a common goal will be achieved. Learners in online learning are in a different learning environment, making them more independent and in this sense capable of taking initiatives but also responsible for controlling their learning path. Under these

circumstances, learning arises as a result of the interaction, activity and initiatives that are being developed (Αναστασιάδης, 2006).

An online learning community combines individuals who have something in common and interact in a variety of ways through a common identity. In this context, an online learning environment should be built around authentic real-world problems, its members involved in joint activities and debates, exchanging information and building relationships that allow learning to the limits cooperation, reflection and interaction. To achieve these goals, the provision of an educational environment that provides participants with decision-making and initiative choices, independence and participation in the learning process, self-evaluation capacities and self-esteem (Graves, 1992) is a prerequisite.

Interaction is a theoretical concept that is a complex phenomenon but also a key to all forms of learning (interpersonal, contemporary, asynchronous, mixed) (Κυρατζίδης, 2013).

Yacci (2000) states that interaction, especially in distance learning, is a critical variable that needs to be clearly defined. In this context it makes a very analytical structural approach to the concept of interaction and defines it as a closed circuit where a message starts from an entity (man, machine or something else), directs to another entity and returns to the original, thus closing the circuit. With regard to inter-network interaction, he points out that this does not end if the message does not pass the circuit from the learner to the recipient and returns to it. It notes that the benefits of interaction in teaching are both cognitive (achievement of learning goals) and emotional (emotions and value-added to learning products) on the other. Lastly, it points out that there must be mutual consistency between the messages exchanged between the sender and the recipient (Μποφιλίου, 2013).

From the above definition and Yacci's thoughts (b. 2013), four variables affect the process of interaction: (a) the interdependence of cognitive and emotional messages; (b) the duration of each message; (c) the amount of information contained in the message; and (d) the delay between the sending of the message and the receipt of a reply.

It is a fact that interaction is one of the most interesting issues of counter-presentation and study over time, for every form of education and of course also for distance learning (Μαυροειδής, 2009; Woo & Reeves, 2007). As a process it attaches great importance to the social relations and reactions of the participants in each learning environment and in this sense it can contribute positively to the achievement of the goals set. Research data shows that increased interaction in remote online learning leads to better learning outcomes (Κουστουράκης, 2003), but at the same time there are important questions concerning the nature and extent of the interaction, as well as the impact which it has in the odds of the participants in an online lesson (Picciano, 2002).

3. Typology of interaction

In terms of online learning, four types of interaction have been recorded in the international literature (Moore & Kearsley, 1996):

- (a) learner interaction with teaching material,
- (b) interaction between trainees,
- (c) learner - trainer interaction, and
- (d) the learner's interaction with the technological environment.

In this perspective, (Thurmond, Wambach, 2004) also refers to the trainee's interaction with himself/herself as he/she reflects while he/she is in a learning path.

Καρατζίδης (2013) reports that Garrison and Anderson (2003) to include modern technology developments also used the concept of "medium", ie the material with which the trainee interacts. The medium may have the traditional form of printed matter or include "modern" and "asynchronous" tele-education, such as a tele-learning tool or a forum for communication. In this context, the instructor - instrument interaction highlights the importance of the medium in the process of interaction. Based on these data, Garrison and Anderson (2003) formulated a more complete model that included six forms of interaction:

- (a) trainer and trainee interaction
- (b) trainee-trainee interaction
- (c) trainee - to - media interaction
- (d) trainer-to-medium interaction
- (e) trainer-trainer interaction
- (f) medium-to-medium interaction

By categorizing the concept of interaction, Donnelly (2010) distinguishes two categories of interactions: transactions interactions involving the exchange of ideas and the process of team decision-making on a subject, and the outcomes related to the intention to enter into dialogue with trainees or the trainer.

Hirumi (2002) quotes another classification with three different mutually interconnected levels of interaction:

- (a) the first level refers to the interactions that take place within the minds of the students. These include the cognitive functions that constitute learning, but also the metacognitive processes that help individuals regulate and monitor their learning. Interactions of this level affect the interactions of the next two levels.
- (b) at the second level there are interactions that take place between the participants and other non-human resources (interface, material, forum, sources outside the platform etc) and finally,
- (c) in the third level there are interactions between the learner and the teaching. These interactions relate to a series of events or strategies that are necessary for someone to achieve the objectives of teaching. These are a post-plan and serve to plan and organize Level 2 interactions, which in turn trigger level 1 interactions

4. The effect of interaction on achieving the objectives of an online course

As research data show that increased interaction in online learning improves participants' performance and contributes to learning efficacy, it is of particular interest to investigate the interaction that interaction might have in achieving the objectives of an online course (Κουτούράκης , et al., 2003). Characteristically, Shea, et al (2001) in a survey of 3,800 individuals, who participated in 264 courses through the SUNY Learning Network (SLN), concluded that the greater the percentage of the course based on discussion and interaction , the more satisfied the participants are.

Also, Hartman and Truman - Davis (2001) in a research on web - based teaching found statistically significant correlations (amount of interaction - $r = 0.726$, interaction quality - $r = 0.807$) the interaction is a critical factor for the participants' satisfaction. Similarly, Dziuban and Moskal (2001) report very high correlations in the relationship between interaction and satisfaction of participants in an online course. Their findings are based on a data collection questionnaire on the effectiveness of teaching at the

University of Central Florida for a period of three years, by students who attended courses of various types of online and undergraduate learning. The survey found statistically significant correlations between the quantity / quality of interaction and satisfaction of students in all types of courses. However, in purely online courses, interaction appears to be the most critical factor in relation to other forms of study.

While most of the research supports the interaction of interaction and satisfaction in online lessons, some researchers point out that in order to successfully interact with participants in an online course they must be particularly adapted to the non-linear and asynchronous nature of the course (Ruberg, Taylor, and Moore , 1996). This labeling is based on the view that a formal learning process tends to be linear, depicting face-to-face communication. Conversely, asynchronous tele-training follows a non-linear communication model that involves significant risks. These are risks that arise from the fact that many discussions and interactions are evolving simultaneously, with the result that trainees communicate with the trainer and with other learners according to their particular interests and opinions.

Sproull & Kiesler (1991) point to an additional risk: that in an asynchronous tele-education discussion, an instructor can not directly correct or clarify a comment as would be the case in a live communication. In this case, if the trainees do not have the experience and the knowledge to understand the meaning of the comments they can be led to the non-information. (Μποφιλίου, 2013).

At the same time, Mackay (1989) points out that in asynchronous learning, the amount of interaction and the number of observations can easily lead to a situation which is described as "information overload". This phenomenon appears because some comments in online discussions tend to be larger and more detailed than in the face-to-face process. However, with more information from many sources, educators need to be more cautious about the quality of the discussion, as the extraordinary wealth of information can lead to a drop in attention. (Μποφιλίου, 2013).

5. Search for techniques to increase interaction

Shackelford and Maxwell (2012) in search of techniques that attribute to interaction promote teamwork, exchange of experience and knowledge sharing.

Cohen (1986) developed the "Complex Instruction" model, according to which the interaction develops through the assumption of different roles and the corresponding skill development by the members of a group. In this direction and with regard to the development of interaction and cooperation, the role of trainers is important (Gunawardena, 1995). However, the relationship between trainers and trainees often appears to be competitive, as continuous communication and close monitoring of the trainers' study steps, although aimed at supporting their studies, may ultimately reduce one from the fundamental values of distance education that is the creation of autonomous learners.

However, the development of social interactions should not be considered as self-evident because the e-learning environment simply allows it. For this reason Kreijns, Kirschner, & Jochems (2003) suggest the design of activities that will encourage this form of interaction alongside cognitive activities. Social interactions play a crucial role in getting to know each other, developing relationships, opinions, confidence, feeling of belonging, and ultimately developing a learning community (Μποφιλίου, 2013).

Boyle (2013) reports that Nandi, et.all (2009), recognizing the importance of interactions in the on-line forums and the quality of the debate being developed, proposes a framework for assessing the quality of dialogue based on four criteria:

- (a) messages that highlight critical thinking,
- (b) messages that highlight new ideas,
- (c) messages suggesting additional sources; and
- (d) messages encouraging others to participate.

Holms (2005) studied the discussions developed at a discussion forum for a teacher education program, using the SOLO classification as an analysis tool. The word SOLO originates from the original Structure of Observed Learning Outcomes and was created by Biggs and Collis (1982) to classify the quality of the learning outcome through the answers given by the individual. Through five levels, the structure of understanding is reached: (a) the learner did not understand the question, (b) understood only one side, (c) understood many aspects, (d) combined several aspects of it, and (e) demonstrated a high degree of abstract thinking.

Holms's results were that 50% of the messages reached the last three levels, indicating high-level interactions. Also that open-ended issues facilitate discussion, and that the presence of the teacher is a critical factor, while there are times when the participation reaches high levels.

Salmon (2000) studied interactions in online teaching and learning and came up with the synthesis of a five-step model describing how interactions are developed, as well as the type of information exchanged between participants in an online learning environment.

The basic philosophy behind Salmon's model is that online learning involves much more than simply taking action in front of a computer. It is a complex process. It includes cognitive, emotional, social processes and mobilization processes. Additionally, learners alongside with the subject of instruction acquire knowledge at metacognitive level (Salmon, 2000).

The five steps and the type of interaction developed by Salmon (2000) are illustrated in Table 1 below.

Table 1.
The Salmon Model

1. Access to the environment, familiarity and motivation to participate
2. Socialization through interaction with the participants
3. Exchange information on the content of the program
4. Building knowledge through discussion, collaboration and communication
5. Development through further application of knowledge - reflection

According to the Salmon model, in the first stage each student interacts with one or two others. After this stage, the number of people with whom each interacts increases, as the frequency of interactions increases. The nature of interactions and the type of information exchanged through messages also change from one stage to another. With

the appropriate support from the teacher, according to Salmon, almost all learners can go through all stages, but the time spent staying at one stage varies according to the knowledge and skills of the learners (Salmon, 2000).

In this section a detailed as much as possible reference was made to the pedagogical context of the study, with an emphasis on the concept of interaction. In this context, we examined the concept and typology of interaction, as well as the impact it has on achieving the objectives of an online course, both in "modern" and "asynchronous" tele-learning processes. Finally, we focused on the degree of interaction and on techniques to increase it, with a view to achieving better learning outcomes.

Κιουλάνης (2013), with the name "Reflective Interaction through Virtual Participants" developed a model of interactive interaction through the presence of Virtual Participants in the online learning process.

The lessons that have been implemented with this method, during the following years, are:

2012: "M@rkus Quests"

2013: "Learning by six thinking hats"

2016: "Building the School of the Future"

2017: "The Secret of Fire"

The research was based on a gradual involvement of Virtual participants in the learning process, and the research data showed that the more active the involvement of Virtual Participants in the learning process, the greater their influence on the interaction between the participants is. (Kioulanis, 2017, Κιουλάνης, 2008, Κιουλάνης, Παναγιωτίδου 2006).

Conclusions

Interaction is a key element of any learning process, while in asynchronous pedagogy of online learning it is important for the success of any activity, mainly due to the lack of communication between the learners involved in the learning process.

The pedagogical dimension of Virtual Learning Environments relies heavily on the theoretical model of constructivism, and the magnitude of the success of an online learning environment depends, to a large extent, on the encouragement and support of active participation and interaction of participants.

The benefits of interacting with the objectives of an online course are important in terms of achieving both cognitive and emotional learning goals.

In order to enhance the interaction in online learning, a series of techniques and models are applied.

The involvement of Virtual Participants in online learning has positive results as it is seen as a key factor in the development of social interactions, the development of interpersonal relationships and a climate of confidence that foster the development of an online learning community.

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