

# Technological development and the perception of interactivity for distance education

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## Abstract

Due to technology development, interactivity in distance education is now feasible; yet, the literature indicates it scarcely occurs in such courses. This article's purpose is to evaluate students' and teachers' perception of interactivity. Accordingly, a questionnaire was constructed using a frame of teaching interaction and tested on ongoing courses.

**Keywords:** Technology management, interactivity, distance education, learning environment

## INTRODUCTION

The constant technological development provides online education with excellent learning opportunities in an interactive way (Bernard et al., 2009; Donnelly, 2010; Joksimovic et al., 2015). In the past few years, topics related to interactivity in education have been discussed by various researchers. (Anderson, 2003; Arbaugh and Benbunan-Fich, 2007; Bernard et al. 2004; Joksimovic et al., 2015; Kanuka, 2011; Litto and Formiga, 2012; Moore, 1989; Sun e Hsu, 2012; Wagner, 1994). In order to have a good performance of the tasks in a distance course, it is necessary to use communication and interaction tools which are grouped in the Virtual Learning Environments . (Grossi et al., 2013).

The technological resources contribute to redefine the learning center (Oblinger, 2006) and the Virtual Learning Environments replace the physical space and provide tools to mediate the learning process (Mulbert et al., 2013). Thus, the distance factor is not an issue because there are some procedures which format the discipline in order to make it easier to access information and enable interaction among users (Moore, 2007).

Although the definition of interactivity comes from different perspectives. It is agreed that interaction demands two fundamental conditions: (a) at least two participants have to interact with each other and (b) each participant's participation should include a reciprocity element. Reciprocity means that the exchange happens from both participants, the action from one brings reaction from the other which leads to alterations on the first (Domagk et al.,

2010). Thus it is extremely important to verify if there is interactivity in this environment between the main agents of the teaching/learning process,

Interactivity in the teaching/learning process is a complex phenomenon which can significantly interfere in the results obtained, and it is important to deepen the understanding of it in the online education context. Thus, this article intends to run a survey among online education learners to assess the importance of interactivity between the following: learner-learner, learner-system, learner-teacher/instructor, in the virtual learning environment and analyze the possibilities and limitations of the platform communication tools. It is presupposed that a better understanding of the interactivity process can trigger improvements to the teaching/learning process.

An important point to be explored in this context is the speed in feedbacking on the teacher's or instructor's part and which effects that causes the learners. This feedback is a polemical issue in Online education, often discussed in the researches as a negative or positive issue (Oliveira and Alves, 2014). Therefore, many writers point out that the learners feel lost from the absence or delay in feedbacking from their instructors/instructors/tutors (Hara et al., 2000; Song et al., 2004).

## **INTERACTIVITY: SUMMARY**

Distance learning reminds us of a vital element for its completion: interactivity. (Grossi et al., 2013). This new path developed by technology constantly changes the relations in online education: the teacher/instructor is no more the link between learners and knowledge, which pushes the knowledge frontiers. Besides, technology diversifies the relations among people, enabling them, even, to make new contacts (Benfatti and Stano, 2010).

The conceptual structure devised by Moore (1989) identified 3 types of interaction: a) learner-system, this type of interaction represents the essence of education and identifies the relation between the learner and the object of study (Anderson, 2003; Moallem, 2003; Woo and Reeves, 2007); b) learner-teacher/instructor, very esteemed, requires the presence of instructors and an extensive involvement from the instructor in the course facilitation and direct instruction (Anderson, 2003; Moore, 1989) and c) learner-learner, a crucial component for the healthy and socially developed community. Interaction is essential for maximizing the learning results (Garrison et al., 1999).

### **Learner-learner Interaction**

Litto and Formiga (2012) points out that interaction between pairs can take place in two non-exclusive ways. In collaborative learning both work as a team, without hierarchical distinctions, in a coordinated effort aiming at reaching a goal. In the cooperative learning, each member is responsible for one part of the task. Both collaborative and cooperative activities in online education are performed through synchronous tools, when the emitter and the receiver are in simultaneous contact during the information transmissions and asynchronous when communication takes places in different moments. The main tools used are chat, e-mail, forum, teleconference, videoconference. This interaction triggers motivation and attention, while learners await feedback from their peers, and lessen the sensation of isolation caused by online education (Litto and Formiga, 2012).

### **Learner-instructor Interaction**

Learner-instructor interaction provides motivation and feedback to learners, helping in learning (Litto and Formiga, 2012). Feedback happens mainly in the solution of doubts to the learners, which is a crucial step for interactivity to happen in the teaching/learning process. Yacci (2000) shows the importance of feedback for interaction, pointing out that without it, the interactive loop would be interrupted (which structurally occurs from the originator individual to the target-individual and, then, returns to the originator individual. Still, in the case of the asynchronous tools, the delay in feedback on the part of the instructors can cause uninterest in the answer on the part of the learners, for in this case, the initial objective of the message may have already been forgotten or may have lost the relevance to the learner, bringing about the lack of interaction (Litto and Formiga, 2012 Yacci, 2000).

## **Learner-system Interaction**

Through the technological development and, mainly, through the internet, the course content are being developed by different ways: sound, text, images, video and virtual reality the learner may interact with the content in many ways: surfing and exploring, selecting, controlling, building, answering, among others. The learner can, nowadays, customize the content with which they will to interact and, also, contribute to the improvement of the material used in the courses. (Litto and Formiga, 2012).

## **METHOD**

The data were gathered by means of a survey answered by Online education learner in Brazilian College Institutions. Google Docs was the tool used to create a 19-question survey, 5 multiple-choice questions, 1 open question and 13 closed questions. The form was available in the <http://goo.gl/forms/iSSpveEyrJ> and learners answered to the questions from 10/29/2015 to 12/04/2015.

This survey through electronic form comprehended 95 learners from 16 College Institutions, among them 10 private and 6 public institutions. Out of 95 learners, 41 come from private institutions and 35 graduation courses and 6 post graduation courses; 44 learners come from public institutions, from 25 graduation courses and 19 from post graduation courses, the remaining 10 learners did not inform which institution they were from.

The main points of analysis of the questionnaire were the interaction between instructors, learners and content, aiming at seeking the participants opinions about the interactions in the virtual environment, mainly when it comes to learner-instructor, learner-learner and learner-system interactions, establishing a basis vitally important for the verification of the hypotheses raised by this assignment.

The results of this study were analyzed from the following perspectives: interactivity as an learning improvement factor; the effect of the interaction among learners in the accomplishment of the tasks; interaction of learners with the course content; and the analysis of the speed of feedback on the tasks/doubts and its effect in the realization of the quality of the course.

## **RESULTS AND DISCUSSIONS**

The analysis of material gathered allowed us to consider the perceptions of learner-learner, learner-instructor and learner-system interactivity. In this part of the assignment the results obtained with the survey are presented and discussed, being divided for the Best presentation and understanding of the results.

According to the data gathering, 93,8% of the respondents said that the Virtual Learning Environment makes available tools of effective communication which enable the information exchange among learners mediating the learning process. The main tools mentioned were e-mail, chat, teleconference, audio conference, blogs and forums. Besides the tools mentioned above, the spontaneous options added by learners as a means of communication used were Whatsapp, text message, MSN and Facebook.

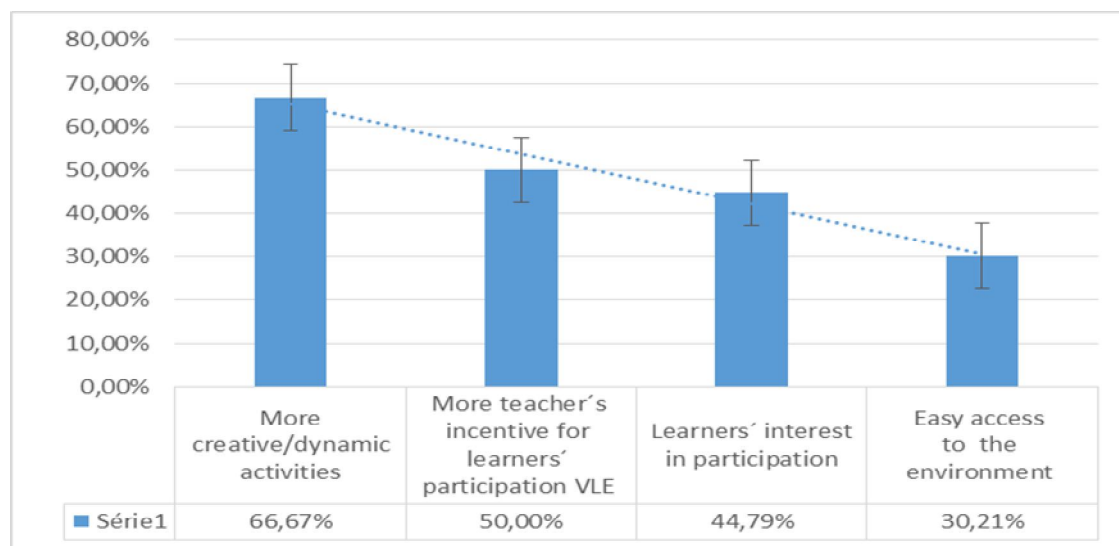
The 6,2% who informed that the VLE does not make available communication tools among learners, tools which make learning more effective, responded that forums were the tools they had to use. That shows that forums themselves are not enough to make possible satisfactory communication among learners.

Although not a synchronous tool, e-mail was said to be one of the 3 most used tools in the communication process: among the learners, 95,8% use this tool, followed by forum 71,9% and chat 61,5%.

Technological development has been improving communication among human beings more and more, giving the daily sensation of less physical distance. The study showed that 68,7% of learners use whatsapp as a means of communication apart from the tools in the virtual learning environment, also having as tools Facebook 57,3% and LinkedIn 9,4%. This alternatives have been undergoing adaptations for information exchange among Online education learners, as a form independent on the VLE, to increase communication among pairs and lessen the isolation sensation.

This alternative means of communication as well as the appropriate use of the VLE tools in a gradual way have been helping in the communication and feedback process, which can improve the sensation of interactivity in Online education courses.

*Table 1-Main points to be explored in order to bring more interaction among learners with the objective of the learning*



According to table 1, in order for there to be more interaction among learners with the content in the VLE, the institution along with their instructors should pay attention to mainly the creation of the activities which are more creative/dynamic 66,67%, considering that these kinds of activities are vital to increase learners' interest and progressively their interaction in the teaching/learning process along the online education course. According to Steil (2006) seeing a real possibility of real communication may have a greater effect on learners' attitude than their attitude related to their individual participation, emphasizing interaction in online education as a means to increase learner's development and satisfaction with the course. An important item mentioned is a greater incentive on the part of the instructors to learners' participation in the VLE (50%), thus, aiming at motivating learners' constant participation in the environment, and, consequently, their better interaction. However, in spite of the instructors' incentive 44,79% of the learners say that their interest in participation is also an item to be assessed. It is observed that 30,21% of the learners notice that some improvements should be made in the Environment in order to make access easier.

The topic easy access appears in another question which showed correlation with the availability of adequate communication tools. It is observed that 100% of the learners indicated that the system does not make available adequate communication tools mention difficulty in accessing the environment. Out of them, 30% informed that the system requires deep internet knowledge.

Another equally relevant topic mentioned in the survey is that only 58,3% of learners receive feedback of their activities (exercises and assignment) that are being done, 39,6% inform that the feedback is given only sometimes and 2,1% do not receive feedback on their activities. That represents 41,7% of learners who take online education courses do not receive adequate feedback when it comes to doubts along the course. This lack of feedback can cause demotivation, more interactivity between instructors and their respective learners (Maia and Matar, 2008).

*Table 2-Time interval between answers of activities and assignments VS Perception of time taken to feedback*

Time taken to Feedback	Perception of time in answers						
	Bad 1	Unsatisfactory 2	Not So Good 3	Good 4	Excellent 5	Total General	MP/ØP
	QT	QT	QT	QT	QT		
Up to 6 hours	0	0	0	2	4	6	4,67
Up to 12 hours	0	0	0	3	0	3	4,00
Up to 24 hours	0	0	6	20	7	33	4,03
Up to 36 hours	0	2	13	3	0	18	3,14
Longer than 36 hours	4	7	9	12	4	36	3,14
Total General	4	9	28	40	15	96	3,79
%	4,2%	9,4%	29,1%	41,7%	15,6%	100%	-

The survey related, according to table 2, the relation between the time instructors take to give feedback informed by learners with the perception of interactivity in the development of exercise and activities and verified that the faster the feedback is given, the perception of interactivity improves.

In the development of the study, the perception of time taken to give feedback rested between good and excellent (4.67), when feedback is given in up to 6 hours; when the

feedback is given in 24 hours, it is perceived as good (around 4.00). However, when feedback is given longer than 24 hours, learners' perception of the time rest on not so good (3.14).

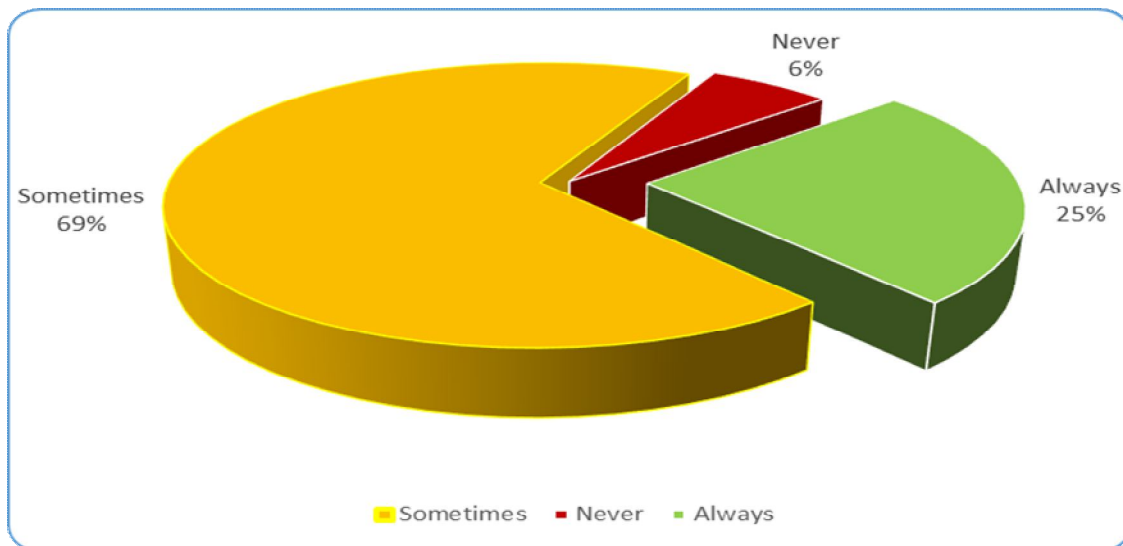
It was verified that 36 of the 55 learners who answered good or excellent, which is 65%, inform that they receive feedback in up to 24 hours, which shows that this interval is more appropriate for feedback and satisfies learners. It sounded odd that 16 out of the 36 learners who receive feedback above 36 hours, assessed as good or excellent, which suggests that this question needs to be better made.

The total of learners who informed that the feedback time is unsatisfactory or bad receive feedback in more than 36 hours. Very compatible percentages were also verified when learners assessed the time between activities and feedback along the course, which shows that 36 hours or more to receive feedback is not very well approved by the learners.

The long time negatively contributes to the perception of real effectivity in the feedback process of a distance course, in comparison with the classroom courses which enable us to solve doubts in a dynamic and interactive way with the presence of the instructor in classroom.

The study realized by Sun (2013) confirms these findings. The author informs that the greater level of interaction was achieved in chat rooms with instant messages, which enables immediate feedback on doubts; the group with medium interactivity discussed opinions in the forum, where the feedback time is considerably longer than the chat and the group with shorter level of interactivity sent e-mails with their ideas to the group.

It is extremely important to observe that the interactions between learners and instructors can become cold and distant in the virtual learning environment, however, it is the instructor's job to invest in the contact with the learners and provide respective feedback on their doubts and activities, so that the "virtual silence" is not established. Quicker answers can make interaction more lively, contributing to learners' involvement with the learning process meaning it will favor the creation of positive experience for both. (Bernini, 2008).



*Figure 1-Contribution of learners in discussions in the VLE*

The interactivity among learners is a crucial point which can be improved aiming at a better acceptance of Online education courses. The study shows, according to graph 1, that

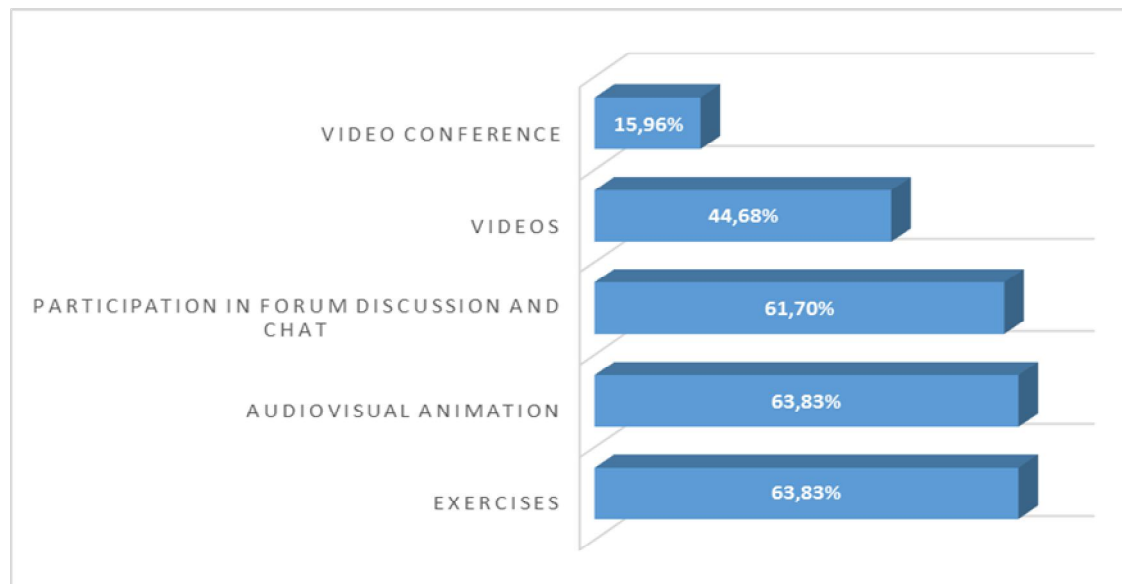
69% of the learners say that only sometimes do their peers contribute with discussions and new viewpoints for the construction of knowledge in the VLE. 6% say that their peers never contribute.

The data shows that it is vitally important to stimulate learners to participate in the VLE. Learners Said that 94% of the times they are stimulated by their instructors to contribute to the course in the forum. This corroborates the issue discussed in table 1 which shows that the instructors' requesting learners participation in the course is not effective. Instructors along with the Institution need to adopt more assertive measures, with the creation of more creative and dynamic activities to stimulate more and more learners' participation and interactivity in distance course, increasing participation in the VLE and, consequently, increasing learners' interest in more active participation in the course.

As for the difficulty in using the VLE, 10% of learners have some difficulty in surfing the course, change topics, modules, use available tools and access the VLE page, to which 7% of the learners Said that the VLE requires deep internet knowledge.

One divergent point is that 41,3% of the learners Who said that they do not have any difficulty in surfing mentioned in the survey some difficulty levels between medium and adequate to find subjects, syllabus, content and necessary actions. This verifies that most of Online education learners do not have much difficulty in the course content access, however, it is important to level the groups with previous use training, because there are learners who cannot successfully use the system.

In order to increase learners interest in the development of the activities, the preferred kinds of learning material could be known. The ones which stood out were exercises (63,83%), the audio visual animation (63,83%) and participation in forum discussions and chat (61,70%). Videos have been mentioned by 44,68%, followed by video conference (15,96%), according to Table 3. These tools enable learners to have greater interactivity with content and among their peers in the development of tasks, consequently making the course more dynamic for the teaching/learning process.



*Figure 2-Learning material preferences*

Interactivity in the learning environment is considered to be a promising option not only for the information presentation but also for the learners' active involvement in the learning process. (Domagk et al., 2010). In this context. It is necessary to rethink the innovation management process in this subsystem with improved models with more individualized instructions, in which learners may have their profile recognized by the VLE and may be able to plan the study according to their interests and needs (Araújo, 2013).

## CONCLUSION

This study enables a better understanding of learner-learner, learner-instructor and learner-system interactivity.

It can be verified that e-mail, forums and chat are the main used tools in the communication process in online courses and that applications such as whatsapp and social networks such as LinkedIn and Facebook, have been contributing to the communication process mainly in learner-learner interaction, progressively lessening the isolation feeling since such alternatives allow interaction between them, in spite of their physical distance.

In order to improve learners notion of learner-instructor interaction, it is necessary that the feedback time be below 24 hours after learners have sent their doubts, activities or exercises, because from 24 hours on, the isolation feeling tends to worsen

In order to increase learners' participation in the VLE, it is verified that instructors must stimulate their participation, besides their own constant participation in forums and chat, the application of practice exercises and also, it is necessary for the VLE to have links to videos and audiovisual animations to share the content in a more dynamic and interactive way.

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