

Role of Student Interaction Interface in Web-Based Distance Learning

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Abstract - This article presents a subject to debate the question of the role of learner-interface interaction in distance education. This role is considered in the aspect of possibilities of distance learning in the three main areas of human perception: cognitive, psychophysical and emotional. The results are of the first phase of a study conducted by the authors on the impact of learner-interface interaction in web-based training on the result achieved, including training courses in ICT students at the University of Forestry - Sofia.

Keywords - *web-based distance education; learner-interface interaction; interactive communication*

I. INTRODUCTION

Traditional forms of education meet the needs of young people at a time when it was possible to envisage with relative security the knowledge and skills that they would need in their adult lives. Today this is not so. Young people can no longer expect to spend their entire lives in the same economic sector or even on the same place; their career paths will change in a way that cannot be foreseen and they will need a wide range of generic skills that will allow them to adapt. In a more increasingly complex and globalized world, creativity, the ability to think versatile, skills into different areas and adaptability as a trend are valued more than specific knowledge. This led to the development of the concept of education and becoming more widely available web-based distance learning courses in educational institutions. Offering e-learning courses is important for the survival of the modern educational institution [8].

Web-based distance education cannot be implemented without the use of the capabilities of modern information and communication technologies. This is reflected in the adoption in 2010 by the European Council Strategy "Europe 2020" [5], which focuses on active and effective use of the opportunities of modern information and communication technologies for the realization of the idea of widely available, tailored to individual needs, continuing lifelong quality education, which all are given equal opportunities to acquire the knowledge and skills necessary for successful social and professional realization.

The purpose of this paper is to suggest the issue of discussion about the role of learner-interface interaction in distance education. In our opinion, this interaction is important for the improvement of personal achievements in the training of individuals, and hence becomes significant for the quality of the education received. The article presents a

theoretical framework, a methodology of research and a discussion on the submitted results.

II. THEORETICAL FRAMEWORK AND METHODOLOGY OF RESEARCH

The analysis is based on the adoption of the following theoretical framework:

- Keegan [2] defines distance education as a system characterized by: 1) the separation of the teacher from the learner through a large part of the learning process, 2) the impact of the educational organization, 3) provide an opportunity to assess and self-assess of the learners, 4) the use of educational media for the presentation of course content, and 5) two-way communication between teacher and student [2].
- Hillman, Willis and Gunawardena [1] added learner-interface interaction as an integral part of the concept of distance learning. This is the interaction that occurs between the learner and the technology used to provide educational content. They claim that the skills of the learner to handle with communication environment is a necessary condition to participate in distance learning course and is positively correlated with success in this course. To acquire knowledge of the course content, the student must be proficient in the technological environment for communication and interaction [1].
- According to Belanger and Jordan [3] learning objectives relate to three main areas of human perception: cognitive, psychophysical and emotional.
- We considered Gestalt psychology (meaning integrity, shape, configuration, connectivity components, closeness, etc.), established in the early decades of the 20th century by Max Wertheimer [9], who studies perception as a single image and the characteristics of the education.

Web-based distance education is learning that takes place via the Internet or Intranet. A Web-browser is mostly used in this type of training, such as Internet Explorer or Firefox. Each training program that uses the Internet as a technology for delivering learning materials, even e-mail correspondence and transfer of files belonging to this type of distance education [11].

Let us consider in more detail the possibilities of distance learning in the three main areas of human perception.

The cognitive domain is divided into six main categories of learning objectives: knowledge,

comprehension, application, analysis, synthesis and evaluation. Each category is based on the requirements and characteristics of the category before it, and each category consists of sub categories. Tasks in the cognitive domain can be achieved relatively easily, using technology and distance education through interaction student-learning content.

Psychophysical area focuses on physical skills, manipulation of objects or other physical activities that require muscle coordination. This area is best expressed for example in speech, physical condition, operating machinery or technical courses, which require a physical activity. Multimedia technologies are successfully used to train physical skills - such as aircraft simulators make people learn from their mistakes, which in a real environment may cause a lot.

Emotional domain is focused on individual preferences for perception and processing of information. As Confucius said, "I hear and I forget. I see and I remember. I do and I understand". Here is the key role of the interactions between the participants in the educational process - teachers, learners, learning content and interface.

Today, the majority of platforms for web-based distance education for communication, assessment and self-assessment are set tools that are widely used in social networking as "Blogs", "Journal", "discussion board" and others. This is in order to facilitate perception of the interface by the learner. However, it must be taken into account that the social networks, although popular, are used by less than half of the population.

Interactive communication, which is basically a web-based distance education involves the creation of a dynamic area, changing space, specific navigation, depending on the preferences of the learner, dynamic design, use of specific computer code into high level language, mobile technologies and constant innovations [10]. Things at each visit of the user are different, depending on his skills gathered information on the system and knowledge of the interests and orientation. Three categories of interactivity are distinguished:

- The first category is a navigation interactivity that allows the student to move through the pages of learning content using the appropriate hyperlinks.
- The second category of functional interactivity allows the student to interact with other users, and receive news, are used especially discussion forums, blog and e-mail.
- Third category adapted interactivity allows customization of the site and the browser, depending on the specific consumer preferences.

If the difficulty in interaction student-interface loses the benefits of interactive communication - generating

knowledge through exchange of ideas and use of a number of modern, digital media and technologies for data transmission and combination of electronic processes [7]. Interactive communication ensures active participation of those students who do not normally express their ideas openly [6].

The learner should understand and be able to work with the technologies used in the training course. When there is incomprehension of the technological realization of a web-based distance education and the inability of the student to work in such an environment, learner-interface interaction is difficult. As a result, only navigation interactivity is most often used. When the interface impedes the learner achieves the best case, only learner-content interaction.

According to the Gestalt psychology in the field of consciousness there are two contexts - figure and background, and the figure is always clearer, cleaner, more detached, more obvious are its limits. The background looks like continuation of the figure but is darker, more distant, less supportive the figure. Under the law for centering the mind is centered on a figure work with it and focused on it. It is not possible for the entire contents of consciousness, to accept the role of figure.

When the interface impedes the learner, he assumes the role of the figure, the training itself becomes background. Essential educational elements of distance learning as interaction with all members of the school community (student-teacher among themselves students), initiating creative activity manifestation of the student, the active construction of knowledge by means of two-way communication student and teacher are lost. A portion of set in the syllabi of the courses skills and habits cannot be developed by the learner. In this case, a small portion of the planned learning key skills and habits are acquired.

III. RESULTS AND DISCUSSION

The research was conducted for the student interaction interface in web-based distance learning on the result achieved, among training courses in ICT students in University of Forestry – Sofia, during the period October 2013 - February 2014; the web-based platform Blackboard Learn [4] was used for the training. Both training courses include tools for interactive communication and conditionally display the following topics in the structure.

The study was conducted in two target groups: students first course degree “Bachelor” and “Master degree” students.

Activity of students in the "Master degree" is shown in Fig. 1 and activity of students in "Bachelor degree" in Fig. 2.

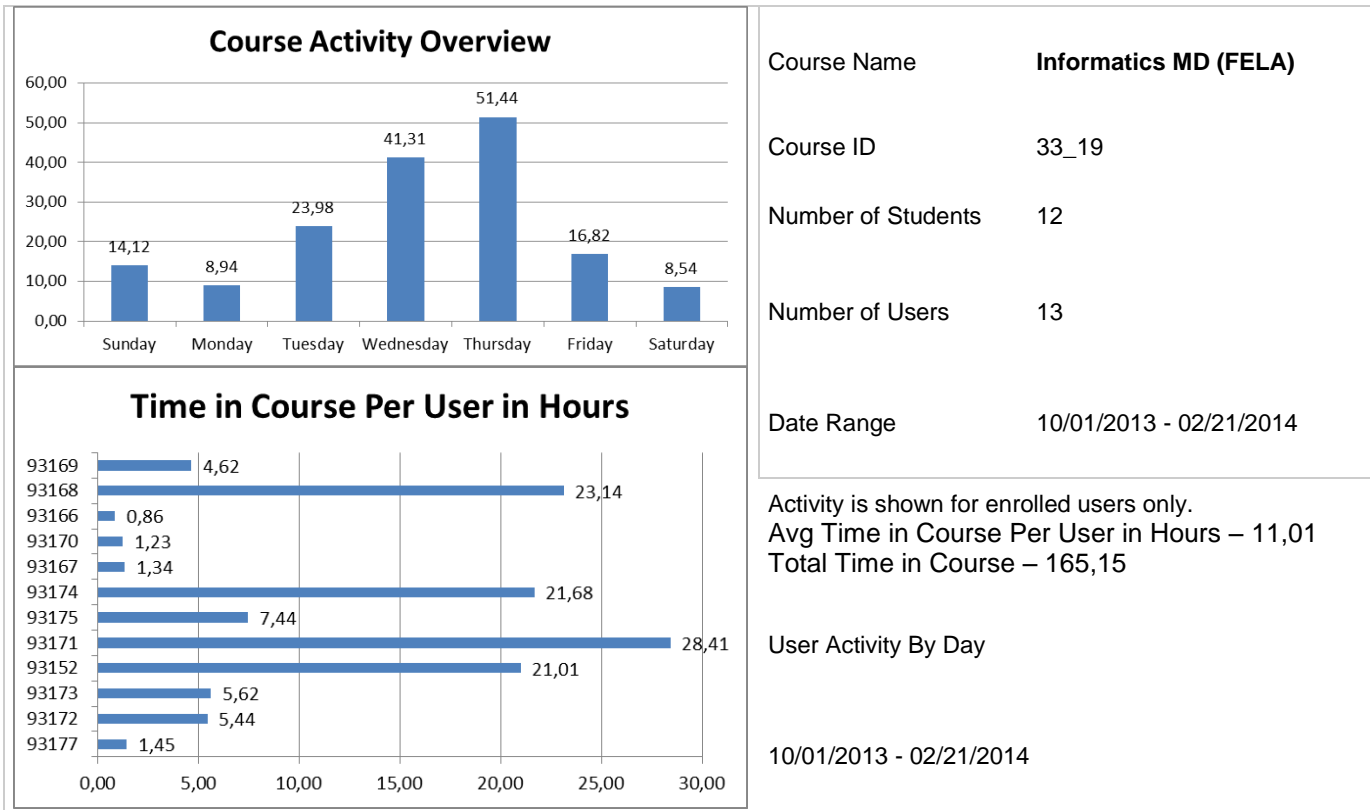


Figure 1. Activity of students in the "Master degree"

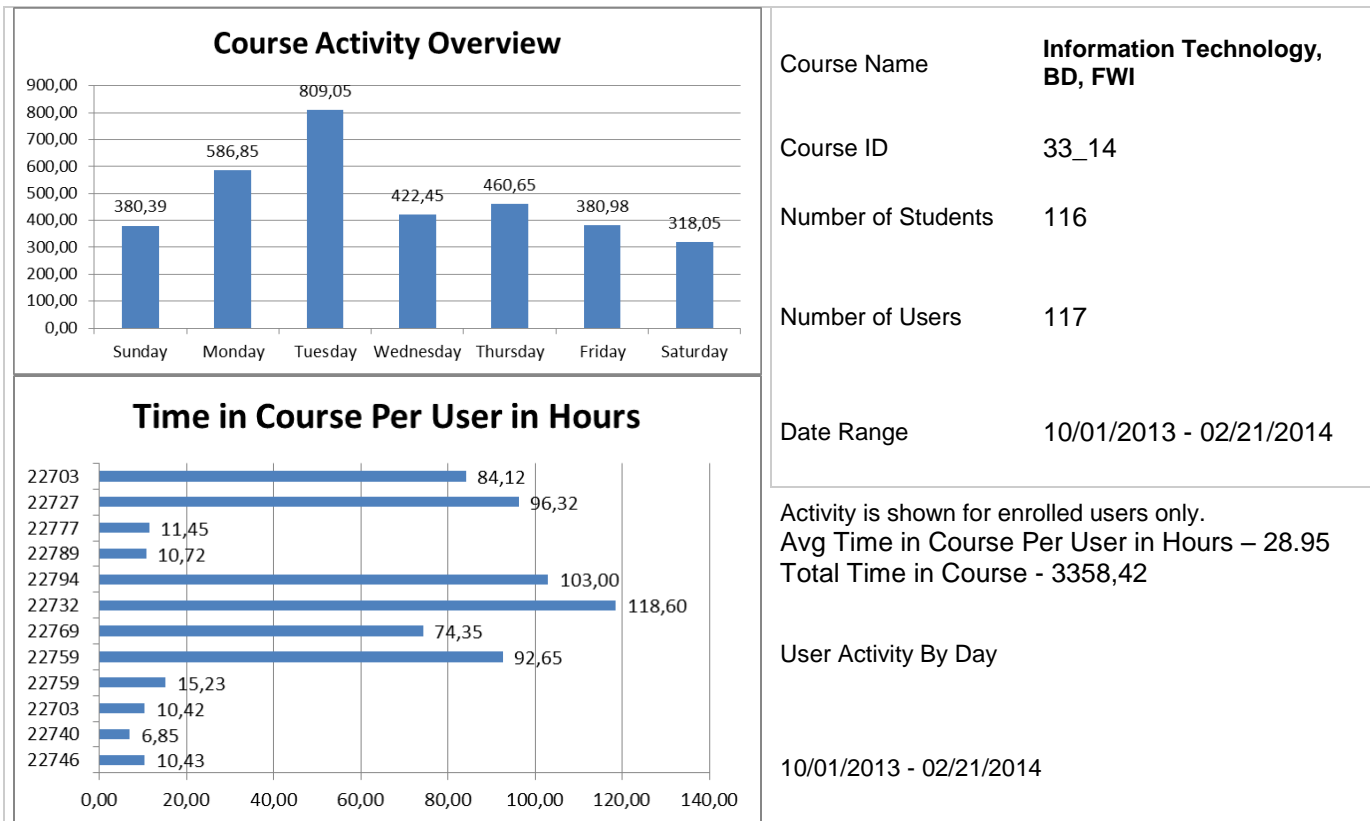


Figure 2. Activities of students in the "Bachelor degree"

Students in "Bachelor degree" browsed educational content significantly longer than students in "Master degree". This can be explained by the fact that they are 1-st course and most of them do not have a system for the utilization of web-based interactive learning content presented. At the end of the course students responded to the questionnaire survey for the work with the system Blackboard Learn. The following section presents the questions and the results.

1. Did you meet any difficulties working with the platform for customizing your account:

	Bachelor	Master
Strongly Agree	8,62%	8,33%
Agree	12,93%	8,33%
Undecided	8,62%	8,33%
Disagree	32,76%	25,00%
Strongly Disagree	37,07%	50,00%

2. Did you meet any difficulties working with the platform for customizing the system:

	Bachelor	Master
Strongly Agree	15,52%	16,67%
Agree	7,76%	0,00%
Undecided	10,34%	16,67%
Disagree	27,59%	25,00%
Strongly Disagree	38,79%	41,67%

3. Did you meet any difficulties working with the platform for customization of the navigation of the educational content:

	Bachelor	Master
Strongly Agree	26,72%	8,33%
Agree	20,69%	8,33%
Undecided	6,03%	16,67%
Disagree	20,69%	25,00%
Strongly Disagree	25,86%	41,67%

4. Did you meet any difficulties working with the platform while managing the educational content – type file management:

	Bachelor	Master
Strongly Agree	7,76%	0,00%
Agree	6,03%	8,33%
Undecided	1,72%	8,33%
Disagree	37,07%	16,67%
Strongly Disagree	43,97%	66,67%

5. Did you meet any difficulties working with the platform while managing the educational content – type URL:

	Bachelor	Master
Strongly Agree	7,76%	8,33%
Agree	9,48%	0,00%
Undecided	7,76%	8,33%
Disagree	31,03%	41,67%
Strongly Disagree	40,52%	41,67%

6. Did you meet any difficulties working with the platform while managing the educational content – type interactive tutorial:

	Bachelor	Master
Strongly Agree	24,14%	16,67%
Agree	16,38%	0,00%
Undecided	1,72%	0,00%
Disagree	20,69%	33,33%
Strongly Disagree	37,07%	50,00%

7. Did you meet any difficulties working with the platform while managing the educational content – type video:

	Bachelor	Master
Strongly Agree	18,10%	0,00%
Agree	7,76%	0,00%
Undecided	6,90%	8,33%
Disagree	27,59%	25,00%
Strongly Disagree	39,66%	66,67%

8. Did you meet any difficulties working with the platform while managing the educational content – type self test and evaluation:

	Bachelor	Master
Strongly Agree	22,41%	0,00%
Agree	12,93%	8,33%
Undecided	1,72%	0,00%
Disagree	30,17%	33,33%
Strongly Disagree	32,76%	58,33%

9. Did you meet any difficulties working with the platform while managing the educational content – type task:

	Bachelor	Master
Strongly Agree	41,38%	8,33%
Agree	22,41%	0,00%
Undecided	2,59%	0,00%
Disagree	15,52%	33,33%
Strongly Disagree	18,10%	58,33%

10. Did you meet any difficulties working with the platform during the interaction process with the professor:

	Bachelor	Master
Strongly Agree	15,52%	0,00%
Agree	7,76%	0,00%
Undecided	22,41%	0,00%
Disagree	24,14%	58,33%
Strongly Disagree	30,17%	41,67%

11. Did you meet any difficulties working with the platform during the interaction process with the rest of the users during the individual working process.

	Bachelor	Master
Strongly Agree	20,69%	8,33%
Agree	13,79%	0,00%
Undecided	8,62%	0,00%
Disagree	25,00%	41,67%
Strongly Disagree	31,90%	50,00%

12. Did you meet any difficulties working with the platform during the interaction process with the rest of the users during the group working process:

	Bachelor	Master
Strongly Agree	29,31%	0,00%
Agree	18,10%	8,33%
Undecided	6,90%	0,00%
Disagree	25,00%	33,33%
Strongly Disagree	20,69%	58,33%

13. Did you meet any difficulties working with the platform while receiving news:

	Bachelor	Master
Strongly Agree	7,76%	0,00%
Agree	5,17%	0,00%
Undecided	12,93%	0,00%
Disagree	31,03%	25,00%
Strongly Disagree	43,10%	75,00%

14. I met difficulties working with the platform during the process of receiving the actual information about scores:

	Bachelor	Master
Strongly Agree	8,62%	0,00%
Agree	12,93%	0,00%
Undecided	11,21%	0,00%
Disagree	28,45%	16,67%
Strongly Disagree	38,79%	83,33%

15. I met difficulties working with the platform during the process of receiving the actual information about incoming events:

	Bachelor	Master
Strongly Agree	19,83%	0,00%
Agree	5,17%	0,00%
Undecided	7,76%	8,33%
Disagree	30,17%	16,67%
Strongly Disagree	37,07%	75,00%

16. The difficulties in working with the platform do you think is mostly due to:

- a) the platform interface;
- b) personal Internet access;
- c) insufficient skills to work with ICT;
- d) I did not encounter any difficulties.

	Bachelor	Master
the platform interface	37,07%	16,67%
personal Internet access	18,10%	8,33%
insufficient skills to work with ICT	20,69%	8,33%
I did not encounter any difficulties	24,14%	66,67%

17. How do you assess the impact of the use of the platform on the end result of your training and knowledge obtained:

	Bachelor	Master
Excellent	18,97%	16,67%
Good	26,72%	58,33%
Poor	25,00%	8,33%
Very Poor	11,21%	8,33%
No impact	18,10%	8,33%

Respondents are 25% of the students first degree "Bachelor's degree and "Master's" (a representative sample of the students in the UF). The results allow the following conclusions:

- Students in degree "Master" encountered significantly less difficulty in learner-interface interaction, regardless of the type of learning resources. This allowed them to concentrate on learning of content and to achieve the final result with less time working in the system;
- Both target groups haven't encountered serious difficulties in customizing their system accounts, the system in general, the access to the learning content type - file, URL, video, receiving news and updated information for the scores;
- Significant differences for the difficulties encountered when working with assessment tools and interaction with other users;
- The reason for the difficulties encountered and the two target groups mainly indicate the platform interface, only then insufficient skills to work with ICT;
- Both target groups assess the impact of the use of the platform on the end result of the training and the knowledge obtained as a very strong and highly.

IV. CONCLUSION AND FUTURE WORKS

In deciding on which technology to use for the realization of distance web-based training, must be given to the ease of use of this technology, i.e., whether users will be able to deal with it.

Time of use of the platform for web-based education is not proportional to the achieved learning outcomes.

The lack of difficulty in learner-interface interaction plays an important role in improving personal achievements in teaching individual learners. Achieved learning outcomes in this case affected only by the personal characteristics of the learner.

When properly structured and built, web-based learning content interaction learner-interface strongly influences the outcome of the training and quality of education.

The study will continue by including students trained in the summer semester of the academic 2013/2014 year and will be repeated in the same target groups during the next two academic years. We hope that after its completion, we will be able to outline clear and definite trends, and the impact of learner-interface interaction in web-based distance learning on the outcome of the training and quality of education.

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