

A Study of Motivation and Satisfaction of Students in E-learning Environment

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Higher education is evolving in the context of the so-called "information society" and it aims to teach the younger generation to deal with the chaotic and the difficult to predict flow of knowledge and new information along with transmission of sound knowledge verified by tradition. E-learning (EL) provides enormous freedom of the learner in terms of means, place, time and rhythm of learning.

Data, as well as analysis of the results of the conducted study among different students (BSc, MSc, Ph.D. students) from an engineering university in Sofia - UCTM are presented in this publication.

The aim of this study is to measure motivation and students' satisfaction in active e-learning environment. The extent to which EL has been adopted in different academic practices has been discussed. The opinion of students of the present willingness of the university for the active introduction of EL in training has been asked for and evaluated.

Keywords: Higher education, e-learning, satisfaction, motivation

Citation: Todorova M., Karamanska D., 2015. "A Study of Motivation and Satisfaction of Students in E-learning Environment", *Applied Technologies and Innovations*, Vol.11(2), pp.82-89, <http://dx.doi.org/10.15208/ati.2015.09>

Introduction

E-learning has begun to embed itself as a part of our educational environment, especially in the higher education and training. New developments in the science of learning emphasize the importance of helping people take control of their own learning. Since understanding and constructing meaning is viewed as crucially important, people must learn to recognize when they understand and when they need more information. What strategies might they use to assess whether they understand someone else's meaning? How can they build their own theories of phenomena and test them effectively? Many important activities that support active learning have been studied under the heading of "metacognition".

Metacognition refers to people's abilities to predict their performances on various tasks (e.g., how well they will be able to remember various stimuli) and to monitor their current levels of mastery and understanding (e.g., Brown, 1975; Flavell, 1973). Teaching practices congruent with a metacognitive approach to learning include those that focus on sense-making, self-assessment, and reflection on what was obtained or achieved and what needs improving. These practices have been shown to increase the degree to which students transfer their learning to new settings and events.

E-learning means that one has to be an active learner. Active learning stands in contrast to "standard" modes of instruction in which teachers do most of the talking and students are passive. What are the factors that motivate students to be active learners in E-learning

environment? One of them is how students view themselves, how they evaluate their competence, knowledge and capabilities. There are two theories that are worth mentioning:

1. Self-determination theory (Deci and Ryan, 1985; 1991), when applied to education, is concerned primarily with promoting in students an interest in learning, a valuing of education, and a confidence in their own capacities to understand and construct knowledge. The positive outcomes are manifestations of being intrinsically motivated. Research suggests that these processes result in high-quality learning and conceptual understanding, as well as enhanced personal growth and adjustment leading to the desired educational outcomes.
2. Another theory is the theory of self-efficacy, which refers to specific beliefs about what one believes one can do and it is a key variable in Bandura's social cognitive theory (Bandura, 1982). Self-efficacy beliefs affect the way one thinks, determine one's level of motivation, dominate one's emotional reactions, and even guide one to make choices at important decisional points (Bandura, 1997). More specifically, the greater one's perceived self-efficacy, the higher the goals one may set for him/herself and the stronger his/her devotion to them and the performance is better.

The difference between these theories of motivation is that the second one focuses on goals or desired outcomes. It is concerned with the direction of behavior toward desired outcomes, but they do not deal with the question of why certain outcomes are desired.

“Self-determination theory focuses primarily on three innate needs: the needs for competence, relatedness, and autonomy (or self-determination). Competence involves understanding how to attain one's and being efficacious in performing the necessary actions; relatedness involves developing secure and satisfying connections with others in one's social milieu; and autonomy refers to being self-initiating and self-regulating of one's own actions” (Deci and Ryan, 2002).

When people or students satisfy their basic needs for competence, relatedness or communication and the sense of being autonomous, it will increase their motivation and hence their performance. E-learning has huge potential to unite and enhance competence, relatedness and autonomy if properly conducted.

Methodology

Sample

The initial sample of this study consisted of a total 55 students (31 women and 24 men) from UCTM in a traditional learning environment (Bachelors and Masters) whose ages ranged from 18 to 22; they were interviewed during the the winter semester of the academic 2013-2014 (Todorova, 2014). Then the following winter semester of the academic 2014-2015 a total of 36 students (22 women and 12 men) from UCTM in a traditional learning environment were interviewed so as to make comparison of the 2 successive years. In addition 17 Ph.D. students from UCTM were asked to fill in the questionnaire so that we can make observations of undergraduate and graduate students or between novices and more or less academically experienced students of the tertiary level. All of them were older than 24 years.

Questionnaire assessing students' satisfaction with E-learning

The study was conducted by a specially designed card - questionnaire. The card contains the following groups of questions:

- The first group - treats the attitudes to the use of electronic technologies for different forms of training, self-education and evaluation of the acquired knowledge.
- The second group of questions focuses on students' judgment about to what extent it is appropriate to implement E-learning in various fields of academic study.

- The third group - requires an assessment of current willingness and implementation of the investigated University for the active introduction of electronic technologies in training (facilities and software base); The qualification of the faculty was viewed separately.
- Some important additional questions were designed for self-assessment of students of their knowledge to work in a Web environment, the time they spend in this environment and technical support.

Results and discussion

Results from a study of perceived satisfaction of the usefulness of electronic technology for various forms of training and supervision

Data are presented in Table 1. and are summarized for all groups of respondents as a percentage (%) of those who gave the assessment.

TABLE 1. USE OF ELECTRONIC TECHNOLOGIES IN VARIOUS FORMS OF TRAINING AND CONTROL

E- learning is useful for:	Degree of satisfaction:					
	Yes, it is useful		Yes, it is partly useful		No, it is not useful at all	
	UCTM, 2014	UCTM, 2015	UCTM, 2014	UCTM, 2014	UCTM, 2014	UCTM, 2015
1.Lectures	49%	50%	45%	47%	6%	3%
2.Seminars	33%	36%	47%	53%	18%	11%
3.Laboratory Work	18%	31%	24%	22%	56%	47%
4.Self-education	42%	47%	44%	47%	14%	6%
5.Self-assessment	35%	47%	47%	53%	16%	-
6.Examination	38%	39%	38%	39%	22%	22%

The data obtained speak in favour of the active implementation of E-learning in education. In practice, only in laboratory exercises the percentage of negative responses exceeded that of full or partial approval. This was observed in 2014. In 2015, we observe surprisingly 31% approval. Lectures are the form of training that must undergo a major transformation through the use of electronic technologies (94% and 97% respectively approve of it). For seminars, the approval for the implementation of electronic technology is 80% and 89% respectively. Quite positive are the trends that are emerging in terms of self-education and self-control - respectively 86% and 82% approval for 2014 and 94% and 100% for the following year, which indicates a high degree of personal motivation. In terms of testing, the majority of the respondents -78%(the new data) tend to be assessed with the help of electronic technology. The percentage of disapproval is still high- 22% of the students think that exams should not be held electronically.

Results of the questions requiring an assessment of the type of courses where the use of electronic technologies is appropriate

When evaluating the of type disciplines, it is noteworthy that respondents with a technical profile of training, considered the most appropriate use of electronic technologies for economic studies and humanities which is true for the two successive years. This can most probably be explained by the fact that the humanitarian profile is associated with less practice and more theory. In comparison, the percentage of full approval for the use of electronic technologies for science is only 2% for UCTM. Results for the application of

EC for engineering and technological disciplines, as well as foreign language are almost equal - 70% approval, disapproval - about 25%, which is in favor of new forms of training.

Evaluation of the current implementation and "willingness" of the universities for active use of E-learning

In Table 2 data in percentage is given by the respondents who assessed the investigated indicators.

TABLE 2. PREPAREDNESS OF THE UNIVERSITY FOR ACTIVE USE OF E-LEARNING

Indicators for current implementation of electronic technologies in teaching	Evaluation of the implementation:							
	Good		Partly Good		Unsatisfactory		No opinion	
	UCTM, 2014	UCTM, 2015	UCTM, 2014	UCTM, 2015	UCTM, 2014	UCTM, 2015	UCTM, 2014	UCTM, 2015
Facilities(computers and network)	22%	69%	41%	25%	33%	6%	4%	-
Multimedia projectors	55%	78%	34%	10%	9%	6%	2%	6%
Free access to Internet	40%	33%	42%	28%	14%	25%	4%	14%
Free access to computers	36%	42%	51%	33%	11%	8%	2%	17%
Software database – software for engineering analyses and design	24%	17%	34%	35%	24%	29%	18%	18%
E-libraries	40%	64%	42%	22%	11%	3%	7%	11%
Self-training programmes	18%	22%	42%	39%	33%	11%	7%	28%
Self-assessment tests	24%	37%	34%	19%	29%	19%	13%	25%
Access to data-bases	38%	42%	42%	33%	16%	6%	4%	19%
Faculty competence	31%	53%	18%	14%	15%	-	36%	33%
Students' competence and knowledge	82%	75%	16%	25%	-	-	2%	-

FIGURE 1. EVALUATION OF THE FACULTY COMPETENCE BY UNDERGRADUATE STUDENTS

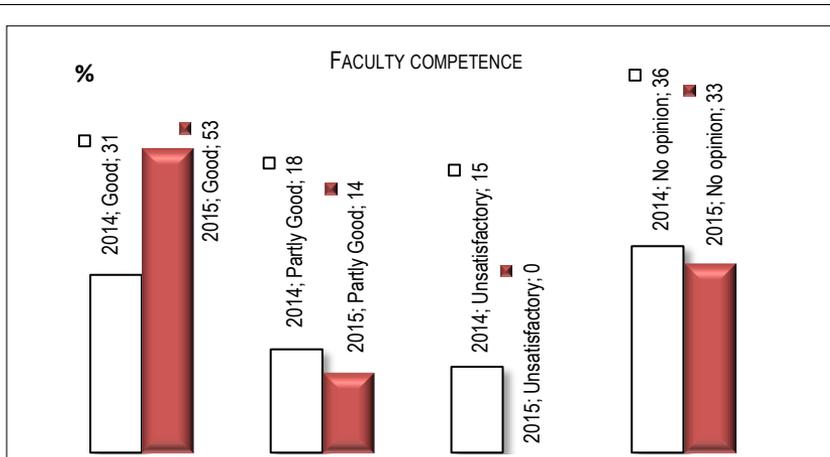
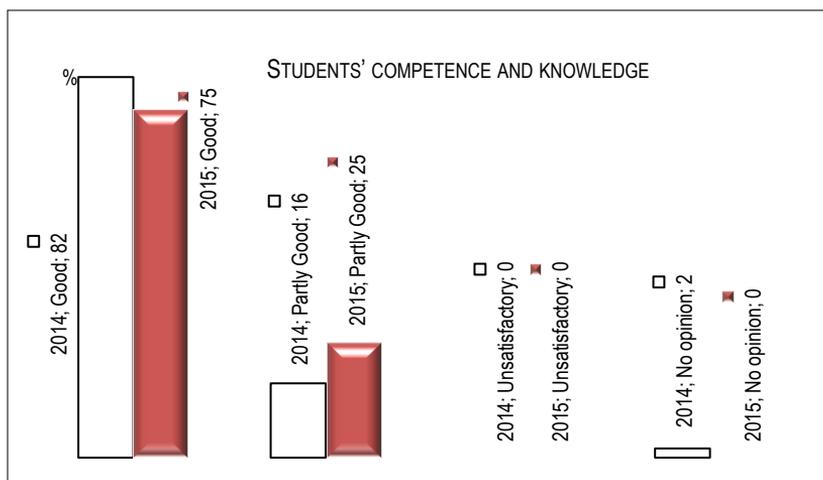


FIGURE 2. EVALUATION OF STUDENTS' COMPETENCE AND KNOWLEDGE BY UNDERGRADUATE STUDENTS



The Facilities (high-class computers and internal university networks) and Software availability (special campus sites, containing specialized training programs) are still in the process of development according to the respondents: about a quarter of the students at UCTM - 22 % approve of Facilities and 24% approve of Software Availability whereas the - 33% of the respondents think it is unsatisfactory and 24% think negatively of Software Availability. The corresponding figures for 2015 are 69% approval for Facilities and 17% approval for Software Availability, 6% and 29% are the respective figures for dissatisfaction with the facilities or the software availability. Free access to Internet and computers is assessed quite positively in 2014 (over 80%). In 2015 the numbers are less positive - 61% and 75%, respectively.

TABLE 3. EVALUATION OF THE USE OF ELECTRONIC TECHNOLOGIES IN VARIOUS FORMS OF TRAINING AND CONTROL BY PHD STUDENTS AT UCTM

E-learning is useful for:	Degree of satisfaction:		
	Yes, it is useful	Yes, it is partly useful	No, it is not useful at all
Lectures	47%	53%	-
Seminars	29%	53%	18%
Laboratory work	18%	41%	41%
Self-education	53%	41%	6%
Self-assessment	70%	24%	6%
Examination	24%	47%	29%

TABLE. 4. EVALUATION OF PREPAREDNESS OF THE UNIVERSITIES FOR ACTIVE USE OF E-LEARNING BY PH.D. STUDENTS AT UCTM

Indicators for current implementation of electronic technologies in teaching	Evaluation of the implementation:			
	Good	Partly good	Unsatisfactory	No opinion
Facilities(computers and network)	24%	41%	29%	6%
Multimedia projectors	35%	59%	-	6%
Free access to Internet	53%	35%	12%	-
Free access to computers	47%	35%	11%	2%
Software database - software for engineering analyses and design	41%	29%	12%	18%
E-libraries	23%	53%	12%	12%
Self-training programmes	24%	35%	29%	12%
Self-assessment tests	18%	41%	35%	6%
Access to data-bases	18%	64%	12%	6%
Faculty competence	52%	24%	-	24%
Students' competence and knowledge	88%	12%	-	-

It is worth adding at this point, that the mere presence of technology does not assure that technology will be properly used to enhance teaching and learning. Technology implementation requires profound changes in the roles of teachers and learners, adequate instructional strategies and technical and administrative support. Faculty competence and students' self evaluation are 31% against 82% in 2014, but in 2015 the tendency is changing 53% against 75%. It seems that the academic staff accept positively the digital challenge and improve their skills and competence. Self-assessment of the surveyed students about their knowledge and skills in an electronic environment - 82% is the most optimistic figure in 2014 but in 2015 it drops slightly. It was found that students who had greater intrinsic motivation and positive self-evaluation showed more positive emotions in the classroom, more enjoyment of academic work, and more satisfaction with their work than did students whose motivational profiles were less autonomous. These results are shown in separate Figures.

In Table 3, the results that were obtained in March, 2015 after asking 17 Ph.D. students to fill in the questionnaire are given.

Ph. D. students were asked to "look back" and evaluate their experience with E-learning. Only when it comes to practical, laboratory work, the number of students who think that it is not very useful is big enough- 41%. On the other hand, it seems that it is viewed as very useful for self-assessment and self-education (94% full or partial approval).

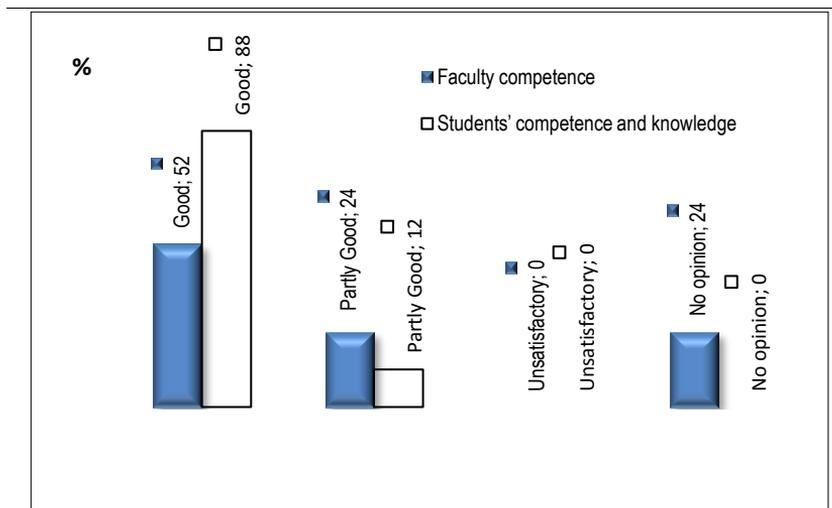
In Table 4 data in percentage is given by the Ph. D. respondents who assessed the investigated indicators.

In E-learning environment, the ability to work independently and sustain one's focus on academic goals is crucial. One has to be a persistent and prepared student. Ph. D. students do fit in this profile and their responses are of interest to us. From the data obtained, it is clear that, their full or partial approval of facilities is not as high as that of undergraduate students. A total of 29% thinks that the facilities are not good enough. Technical and administrative support is an important factor for the satisfaction, persistence and motivation of the students. There should be more user-friendly computers and software. There should be more high class computers and technology that meet the ergonomic criteria and standards.

Another figure that is worth commenting is their evaluation of self-assessment tests. A total of 35% thinks that at this stage they are not good enough. Ph. D. students are a different category of students, because they are independent researchers and they are often motivated intrinsically by the pure interest in the subject or by professional

advancement. They are responsible enough and they face many demands like scheduling, time management, self-directedness, computer self-efficacy and self-discipline. Not surprisingly, their expectations are higher.

FIGURE 3. EVALUATION OF FACULTY COMPETENCE AND STUDENTS' COMPETENCE AND KNOWLEDGE BY PH.D. STUDENTS



Last, but not least, Ph.D. students' evaluation of their own competence and that of the faculty are important indicators. 88% think that their knowledge is good enough, which means that they are computer-confident, which is a prerequisite to complete a given task successfully. Their evaluation of faculty competence is 53% which is a positive figure but still there is a huge gap when we compare the figure of the "digitally native" new generation's evaluation of their competence and that of their teachers. The results are shown separately in Figure 3.

Suggestions for future research

Gender differences can be further explored in regard with Internet anxiety or who is more likely to be influenced or motivated in the Internet-based environment.

The desire and motivation of students to use technologies to facilitate their studies is an important driver of the adoption of cloud computing in the educational system that needs further research investigation. Students expect smooth and quick access to university resources that can be implemented more easily through cloud computing infrastructure. More research should be done on the new way students learn through technology, which can be incorporated into technical and administrative access to course materials. There is a need for more investigation about the use of cloud computing services in order to increase the levels of motivation by the new generation. Since the users will have different computer self-efficacy rates about cloud computing the benefits of this technology can be enhanced through educational processes.

Conclusion

In order to keep up the high internal or intrinsic motivation of students in electronic environment (a high percentage of self-assessment of their knowledge and capabilities, and a desire for self-education and self-control) it is necessary to create the right

environment for learning and building up competences, that will evolve into relatedness with the other students and into autonomy.

The observance of ergonomic recommendations and standards for healthy and comfortable work in an electronic environment is another “must”. There should be more user-friendly computers and software, as well as comfortable working places.

The benefits and the need to expand the E-learning can be seen from Table 1 and Table 3. Full and partial approval of E-learning is predominant even for laboratory work in 2015. PhD students’ evaluation is also positive and they confirm categorically the ubiquitous penetration of this training.

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