Students Readiness for E-Learning: An Assessment on Hacettepe University Department of Information Management

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Abstract. Students are one of the key elements during the implementation of e-learning systems within universities. To be able to build solid and effective e-learning systems, it is important to know the level of students' readiness. In this paper, e-learning readiness of the Department of Information Management (DIM) students at Hacettepe University will be investigated. A 39-item e-learning readiness questionnaire (along with some descriptive questions, such as gender and grade-level) that was tested in previous studies was used to obtain the data. The results show that, although some improvements are needed, DIM students are at the expected level of e-learning readiness, in general.

Keywords: E-learning readiness, higher education, students' readiness.

1 Introduction

The concept of e-learning has been discussed in recent years by many institutions and researchers under the topics of "online learning", "distance learning", "distance education", "virtual learning", etc. in Turkey [1], [2], [3]. Although in practice there are some attempts in the universities to develop e-learning programs, the acceptance or readiness of the faculty and students has not been investigated much. It is important to understand the agents that affect the e-learning eco-system in order to create solid e-learning environments.

This study is based on our previous research which revealed the readiness levels of academic staff working at the Faculty of Letters of Hacettepe University [3]. This time the aim is to investigate the readiness levels of the Department of Information Management (DIM) students. Hacettepe University's DIM is one of the largest departments in the Faculty of Letters, with its 311 undergraduate students. According to the results of our former study, the academic staff of the DIM had the highest scores among other departments in the Faculty, in terms of e-learning readiness.

E-learning is particularly important for information science programs of universities, since the discipline evolves rapidly and this change affects the theoretical curriculum as well as the practice [4].

2   E-Learning Readiness Assessment

The readiness of teachers [3], [5], [6], [7], [8], [9], [10] and learners [11], [12], [13], [14], [15], [16] for e-learning had been discussed in several studies in the last decade. The studies showed that results related to the different aspects of e-learning readiness can vary over time, among institutions or instruments that were used for the assessment.

The results of e-learning readiness assessments, applied to the academic staff of Turkish higher education, reveal some different results similarly to the international literature. For example, according to Akaslan and Law's study [7], teachers working in the higher education institutes associated with the science of electricity in Turkey have confidence and positive attitudes towards e-learning. On the contrary the assessment which was carried out on the Faculty of Letters academic members revealed that the majority of the departments in the Faculty were not ready for e-learning except for the Department of Information Management [3].[1] These results point to the necessity of assessment studies in different disciplines and show that the readiness level varies from institution to institution.

According to the related literature, readiness levels of students can also vary from their grade-levels to the attitudes of teachers who develop and deliver online courses. For example Hung, et. al's study [13] showed that higher grade college students were significantly more ready than the lower grade students. The study also emphasized the teachers' roles in helping to develop self-directed learning and learner-control skills and attitudes among the students. Another study [14], that stressed the effect of teachers in supporting students to adopt e-learning systems, presented the impact of some constructions of Technology Acceptance Model (such as perceived usefulness, perceived ease of use) on students' attitudes, which affected their intention to use e-learning systems.

Akaslan and Law [11] conducted one of the most comprehensive studies on e-learning readiness of university students in Turkey, which was targeted a specific group: students studying electricity-related disciplines. Their model was based on their previous study [7], in which they assessed the readiness of teachers from several Turkish Universities working in the above mentioned discipline, with some added factors that can be viewed as specific for the students (Fig. 1).

Their assessment was conducted with a 78-item questionnaire based on three main factors; readiness, acceptance and training. The results showed that students were "sufficiently ready" for e-learning [11].

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[1] In this study [3], e-learning readiness of Hacettepe University Faculty of Letters (HUFL) academic staff was tested with a questionnaire of 37 items that measures the perceptions of the participants in terms of Readiness, Acceptance and Training. It was found out that for most of the items there were statistically significant differences among the mean scores of the departments, and the majority of the departments in the Faculty were not ready for e-learning except for the Department of Information Management.

Fig. 1. Akaslan and Law's [11] model for measuring students' readiness for e-learning

Recent studies conducted on students mostly revealed positive results, which mean they generally see themselves almost ready for e-learning [11], [12], [17].

3   Research Methodology

Our previous study [3] revealed that the DIM of Hacettepe University Faculty of Letters is the only department which was almost ready in terms of its academic staff among 16 departments at the Faculty. Starting from this point, we wondered about the situation for DIM students. The aim of this study is to assess the readiness of 311 students who were enrolled in the undergraduate program of DIM at the time this research was conducted. Our paper addresses the following research questions:

- Are the students of DIM ready for e-learning?
- What are the students' perceptions about the main components (availability of technology, use of technology, self confidence, acceptance and training) of e-learning?
- Are there any differences among the students regarding their genders, grade-level and use of smart phones in terms of accepting/rejecting e-learning?

To be able to determine the readiness level, a paper-pen questionnaire was employed to the 311 DIM students. Participants were asked to report their perceptions on readiness for e-learning. The questionnaire had been developed and tested by Akaslan & Law [11] and based on a conceptual model of the readiness for e-learning which assesses the perceived readiness in three phases namely, readiness, acceptance and training (Fig. 1). Original questionnaire had 78 items which are measured with a binary choice or a five-point Likert scale, along with some free text boxes for the participants to explain their scores or choices [11]. Nevertheless, we adopted only the items that can be answered with the Likert scale, in order to understand the basic

similarities and differences in the perception of academic staff and students of DIM regarding to e-learning readiness.

Students reported their perceptions on 39 e-learning related items regarding the five main components of e-learning readiness with a five-point Likert scale with 1 being "strongly disagree" and 5 being "strongly agree". Aydın and Taşçı's [18] identification of "expected readiness" for e-learning (which was defined as the mean score of 3.40) was used to interpret the results (see Fig. 2). Same scale was also adopted in the past studies by Akaslan and Law [7], [11] and Soydal, Alır and Ünal [3].
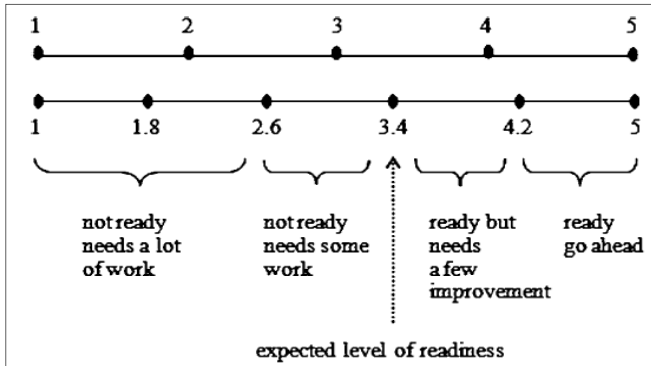

Fig. 2. E-learning readiness assessment model [18]

4   Findings and Discussion

DIM has a four-year undergraduate program and the distribution of the students according to their first to fourth year was; 73, 38, 38 and 129, respectively. There were also 33 students who were not able to graduate and had been studying in DIM for five years or more.

The e-learning readiness survey was applied to all of the DIM undergraduate students and 262 responses were obtained. In other words, our study represents the opinions of 84% of our target audience. The majority of the respondents were female (76%, n= 198[2]) and had personal computers (96%, n= 251). More than half of the respondents had internet-connected smart phones (66%, n=172). There were only six students who stated that they had neither personal computer nor smart phone out of 262 respondents (64%, n=167 of them had both).

The e-learning readiness survey has five main components that aims to reveal "availability of technology" facilities, "use of technology", "self confidence", "acceptance" levels and "training" needs of the respondents. Five-point Likert type scores correspond to strongly disagree/never (1); strongly agree/always (5). Table 1 shows the students' opinions for each item and the overall score for the DIM students in terms of e-learning readiness.

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[2] This also reflected the total distribution of gender out of 311 undergraduate students of DIM, where 72% (n= 224) of the students were female.

Table 1. Mean scores for the e-learning readiness survey

Description	Items		$\overline{X}$	SD
Availability of Technology	I.1	The hardware facilities are enough.	3.6	1.0
	I.2	The software facilities are enough.	3.4	1.0
	I.3	The speed of the internet access is satisfactory.	2.9	1.1
	I.4	The stability of the internet access is satisfactory.	2.6	1.1
	I.5	I have access to computer whenever I need.	3.6	1.2
	I.6	I can connect internet whenever I need.	3.4	1.1
		Availability of Technology $\overline{X}$ =	3.3	1.1
Use of Technology	I.7	I use internet as information source.	4.1	0.7
	I.8	I use e-mail as the main communication tool with my teachers and classmates.	4.0	0.8
	I.9	I use office software (e.g. M.S. PowerPoint, Word, Excel).	4.1	0.8
	I.10	I use social network sites (e.g. Facebook, Twitter).	4.4	0.9
	I.11	I use specific software (e.g. SPSS).	2.6	1.1
	I.12	I use instant messaging (e.g. Google Talk, Skype).	3.5	1.2
	I.13	I use Web 2.0 tools (e.g. Blog, wiki) to share information.	3.2	1.2
	I.14	I use file hosting services (e.g. Google Documents, Dropbox).	3.0	1.2
	I.15	I use learning management systems (e.g. Blackboard, Moodle).	2.6	1.2
	I.16	I use online forums and chat to communicate with my colleagues.	2.9	1.1
	I.17	I use mobile technologies (e.g. Smartphone, Tablet) to connect internet.	3.6	1.3
		Use of Technology $\overline{X}$ =	3.5	1.0
Self Confidence	I.18	I have information about what e-learning is.	3.6	0.8
	I.19	I have the skills to operate a computer.	3.9	0.8
	I.20	I am able to use office software for content delivery and demonstration (e.g. M.S. Power Point, Word, Excel).	3.9	0.8
	I.21	I am able to use web browsers (e.g. Internet Explorer, Google Chrome).	4.2	0.7
	I.22	I am able to use search engines (e.g. Google, Yandex).	4.2	0.7
	I.23	I can troubleshoot most problems associated with using a computer.	3.6	0.9

Table 1. (*Continued*)

Table 1. (cont'd)

	I.24	I can use digital file management tools (e.g. deleting or renaming a file on your computer).	4.2	0.8
	I.25	I am able to do my homework by using electronic technology facilities.	4.3	0.8
	I.26	I have enough time to prepare my homework by using electronic technology facilities.	4.1	0.8
	I.27	I am able to use learning management systems (e.g. Blackboard, Moodle).	3.2	1.0
	I.28	I believe that e-learning is easy to use.	3.8	0.9
	I.29	I feel that I am ready for e-learning.	3.8	0.9
		Self Confidence $\bar{X} =$	3.9	0.8
Acceptance	I.30	I am keen to start e-learning.	3.7	0.9
	I.31	I believe that e-learning can enhance the quality of education.	3.9	0.9
	I.32	I believe that using e-learning can increase my productivity.	3.9	0.9
	I.33	I believe that e-learning is more effectively than the traditional classroom-based approach.	3.6	1.1
	I.34	I believe that e-learning enables learners and instructor to communicate and interact better with one another.	3.5	1.1
	I.35	I believe that e-learning have benefits for education.	3.9	0.9
	I.36	I support implementation of e-learning in my department.	3.9	1.0
		Acceptance $\bar{X} =$	3.8	1.0
Training	I.37	I need training on e-learning.	4.0	0.8
	I.38	My teachers need training on e-learning.	3.5	1.0
	I.39	My classmates need training on e-learning.	4.0	0.8
		Training $\bar{X} =$	3.8	0.9
		Overall Mean:	3.6	1.0

Lowest mean scores (Table 1) differ between 2.6 and 3.2, where items are mostly related to *use of technology* and *availability of technology* components. These mean scores can be interpreted as students were not ready when it comes to using specific software (I.11, $\bar{X} = 2.6$), online forums and chat (I.16, $\bar{X} = 2.9$), file hosting services (I.14, $\bar{X} = 3.0$), Web 2.0 tools for information sharing purposes (I.13, $\bar{X} = 3.2$) and learning management systems (I.15, $\bar{X} = 2.6$). It seems they were not confident about using learning management systems (I.27, $\bar{X} = 3.2$) either. Students also did not find stability (I.4, $\bar{X} = 2.6$) and speed (I.3, $\bar{X} = 2.9$) of the internet access satisfactory.

Most of the highest mean scores based on the students' perceptions belong to *self confidence* and one of them belongs to *use of technology* component (Table 1). Results show that students were confident about using basic file management tools (I.24, $\bar{X} = 4.2$), web browsers (I.21, $\bar{X} = 4.2$), search engines (I.22, $\bar{X} = 4.2$), social networking sites (I.10, $\bar{X} = 4.4$) and they were also capable of doing their homework by using the technology (I.25, $\bar{X} = 4.3$).

It is noteworthy that none of the mean scores for the items regarding e-learning readiness was 5 and the overall mean score (3.6, see Table 1) for the total of 39 items was slightly higher than the expected readiness level, which was indicated by Aydın and Taşçı [18] (see Fig. 2). This result means the students of DIM seems ready for e-learning but there is still some work that needs to be done especially in terms of the availability and the use of technology (Availability of Technology $\bar{X} = 3.3$; Use of Technology $\bar{X} = 3.5$). Moreover, among other components, students seems like they felt themselves "confident" when it comes to e-learning (Self Confidence $\bar{X} = 3.9$) (see Fig. 3).

Fig. 3. Mean scores for e-learning components

With the e-learning readiness survey we also wanted to see the potential differences among the DIM students, in terms of gender, grade-levels and also the use of smart phones, by applying Chi-Square tests.

Gender differences are statistically significant for the Items 8 (I use e-mail as the main communication tool with my teachers and classmates; $\chi^2 = 10.020$, $p<0.05$), 15 (I use learning management systems; $\chi^2 = 10.380$, $p<0.05$), 24 (I can use digital file management tools; $\chi^2 = 11.643$, $p<0.05$) and 33 (I believe that e-learning is more effectively than the traditional classroom-based approach; $\chi^2 = 12.765$, $p<0.05$). In other words, e-mail and some learning management systems usage patterns of the DIM students differ according to their gender, as does using the file management tools on their personal computers. Opinions of DIM students also seem to be differ

according to their gender, when it comes to the effectiveness of e-learning as compared to traditional classroom-based learning activities. Females seem more enthusiastic using e-mail, learning management, and file management tools.

E-learning perceptions of the DIM students were also analysed according to their grade levels. Students were asked to indicate the years they spent in the Department as an undergraduate student. According to the results, students' grade-level differences were statistically significant for the items 9 (I use office software; χ^2= 44.892, $p<0.01$), 10 (I use social network sites; χ^2= 28.904, $p<0.05$), 11 (I use specific software; χ^2 54.645, $p<0.01$), 14 (I use file hosting services; χ^2= 42.348, $p<0.01$), 28 (I believe that e-learning is easy to use; χ^2= 28.441, $p<0.05$), 30 (I am keen to start e-learning; χ^2= 28.027, $p<0.05$), 31 (I believe that e-learning can enhance the quality of education; χ^2= 33.574, $p<0.01$), 32 (I believe that using e-learning can increase my productivity; χ^2= 35.677, $p<0.01$), 33 (I believe that e-learning is more effectively than the traditional classroom-based approach; χ^2= 35.129, $p<0.01$), 34 (I believe that e-learning enables learners and instructor to communicate and interact better with one another; χ^2= 27.491, $p<0.05$), 35 (I believe that e-learning have benefits for education; χ^2= 44.286, $p<0.01$), 36 (I support implementation of e-learning in my department; χ^2= 41.514, $p<0.01$), 37 (I need training on e-learning; χ^2= 34.023, $p<0.01$), 38 (My teachers need training on e-learning; χ^2= 37.626, $p<0.01$) and 39 (My classmates need training on e-learning; χ^2= 33.696, $p<0.01$). These items showed that students' grade-level affected their opinions especially for the *use of technology*, *acceptance* and *training*-related issues. Their tendency to accept e-learning grew as the number of years they spent in the Department increased. Moreover, they seemed more confident while using technology as their grade-levels rose. On the other hand, regarding the need for training, first, second and third year students seemed relatively more enthusiastic for e-learning training, possibly because of their awareness of lack of information about the topic.

We also tried to find out if there were any differences among the e-learning perceptions of DIM students in terms of their use of smart phones. The students were asked if they had an internet-connected smart phone and 66% of them answered that they did. The results showed that the smart phone user and non-user students' opinions differ for the items 4 (The stability of the internet access is satisfactory; χ^2= 11.337, $p<0.05$), 5 (I have access to computer whenever I need; χ^2= 9.968, $p<0.05$), 6 (I can connect internet whenever I need; χ^2= 11.976, $p<0.05$), 10 (I use social network sites; χ^2= 13.978, $p<0.01$), 12 (I use instant messaging; χ^2= 20.096, $p<0.01$), 14 (I use file hosting services; χ^2= 9.530, $p<0.05$), 17 (I use mobile technologies to connect internet; χ^2= 108.514, $p<0.01$) and 36 (I support implementation of e-learning in my department; χ^2= 14.978, $p<0.01$). These results indicated that students' opinions for some items of the *availability of technology* and *use of technology* components and also one item for *acceptance* were affected by the students' smart phone usage habits. The ones that were using internet-connected smart phones seemed more ready in terms of adopting technology, which was one of the core elements of e-learning.

5   Conclusion

E-learning is one of the hot topics, especially for universities' agendas. For an effective implementation of an e-learning programme some serious planning and analysis need to be done. Assessing teachers' and students' readiness for e-learning is one of the main factors during the planning and implementation of e-learning projects.

According to our previous study, teaching staff of DIM was the most ready department within the 16 departments of the Faculty of Letters of Hacettepe University [3]. In this study we tried to assess DIM students' e-learning readiness.

Based on the Aydın and Taşçı's [18] assessment interpretation (see Fig. 2) the results showed that, although the students of DIM were not fully ready to adopt e-learning, for the "use of technology", "self confidence", "acceptance" and "training" related issues, they were slightly higher than the expected level of readiness. This can be interpreted to mean that the students of DIM were ready but some improvements need to be done. Developing training programs for the students in order to help them to understand e-learning better, making its benefits more clear, offering better internet infrastructures with more computer and mobile technology facilities can help students increase their readiness levels. The only component below the expected level of readiness was "availability of technology". This means, before implementing any kind of e-learning programs, students' technological facilities must be improved. This is also interesting, because almost all students (96%) declare that they have personal computers and more than half of them (66%) said that they have Internet-connected smart phones. This makes us think that, students might not be satisfied with the technological facilities that they assume the university has to offer them.

Gender, grade-level and smart-phone usage differences also had some effect on some items related to e-learning-readiness. Although females seem more enthusiastic about using e-mail, learning management and file management tools, these clues about the opinion differences between the genders and their possible causes should be analyzed more and examined with some in-depth research. On the other hand, results also showed that opinions on the *use of technology*, *acceptance* and *training*-related issues may vary according to the students' grade-levels. Fourth-year students seemed especially more adapted to e-learning and its components. Moreover, the results indicated that first, second and third-year students need to be trained more about e-learning. Since DIM has a technology-based curriculum, it could be viewed as normal for senior students to get used to technology and more readily adopt e-learning related issues. Furthermore, the use of internet-connected smart phones also affected students' perceptions regarding the *availability* and *use of technology* components. They seem more open to mobile technologies and probably wished to stay connected from anywhere/anytime, which is also important for competent e-learning activities.

Although the findings of this study may give some tips about the profile of the students of a department with a technology based curriculum, more comprehensive studies must be conducted and reported throughout Turkey in order to determine a model for a course of action for transitioning to an e-learning system in the whole country.

References

1. Baltacı-Goktalay, S., Ocak, M.A.: Faculty Adoption of Online Technology in Higher Education. The Turkish Online Journal of Educational Technology 5, 37–43 (2006)
2. Koçer, H.E.: Web Tabanlı Uzaktan Eğitim. Unpublished master's thesis, Selçuk University, Konya (2001)
3. Soydal, İ., Alır, G., Ünal, Y.: Are Turkish Universities Ready for E-learning: A Case of Hacettepe University Faculty of Letters. Information Services & Use 31, 281–291 (2011)
4. Roknuzzaman, M.D., Umemoto, K.: Knowledge Management Education in Library and Information Science Schools: An Exploratory Study. In: Asia-Pacific Conference on Library & Information Education & Practice, Preparing Information Professionals for International Collaboration, Tsukuba, Japan, March 6-8 (2009)
5. Hegarty, B., Perman, M.: Approaches and Implications of eLearning Adoption in Relation to Academic Staff Efficacy and Working Practice Final Report, Universal College of Learning (2005), http://cms.steo.govt.nz/NR/rdonlyres/8C221A73-CF28-4CC9-83E8-B8FD7D9C1164/0/ALETfinalReport251006.pdf
6. Bonanno, P.: Developing an Instrument to Assess Teachers' Readiness for Technology-Enhanced Learning. In: 14th International Conference on Interactive Collaborative Learning (ICL 2011), Piešťany, Slovakia, September 21-23, pp. 21–23 (2011)
7. Akaslan, D., Law, E.L.-C.: Measuring Teachers' Readiness for E-learning in Higher Education Institutions Associated with the Subject of Electricity in Turkey. In: Proceedings of 2011 IEEE Global Engineering Education Conference (EDUCON)-Learning Environments and Ecosystems in Engineering Education, Amman, Jordan, pp. 481–490 (2010)
8. Tezer, M., Bicen, H.: Üniversite Öğretim Elemanlarinin E-eğitim Sistemlerine Yönelik Hazır Bulunuşluğu. In: International Educational Technology Conference, Anadolu University, Turkey (2008)
9. So, K.K.T.: The E-learning Readiness of Teachers in Hong Kong. In: Proceedings of the Fifth IEEE International Conference on Advanced Learning Technologies (ICALT 2005), pp. 806–808. IEEE Computer Society, Washington, DC (2005)
10. Kaur, K., Abas, Z.W.: An Assessment of E-learning Readiness at Open University Malaysia. In: Proceedings of the International Conference on Computers in Education (ICCE), Melbourne, Australia, November 30-December 4 (2004)
11. Akaslan, D., Law, E.L.-C.: Measuring Student E-Learning Readiness: A Case about the Subject of Electricity in Higher Education Institutions in Turkey. In: Leung, H., Popescu, E., Cao, Y., Lau, R.W.H., Nejdl, W. (eds.) ICWL 2011. LNCS, vol. 7048, pp. 209–218. Springer, Heidelberg (2011)
12. Tubaishat, A., Lansari, A.: Are Students Ready to Adopt E-learning? A Preliminary E-readiness Study of a University in the Gulf Region. International Journal of Information and Communication Technology Research 1, 210–215 (2011)
13. Hung, M.L., Chou, C., Chen, C.H., Own, Z.Y.: Learner Readiness for Online Learning: Scale Development and Student Perceptions. Computers & Education 55, 1080–1090 (2010)
14. Park, S.Y.: An Analysis of the Technology Acceptance Model in Understanding University Students' Behavioral Intention to Use E-learning. Educational Technology & Society 12, 150–162 (2009)

15. Jahng, N., Krug, D., Zhang, Z.: Student Achievement in Online Distance Education Compared to Face-to-face Education. European Journal of Open, Distance and E-Learning (2007), `http://www.eurodl.org/materials/contrib/2007/Jahng_Krug_Zhang.htm`
16. Smith, P.J., Murphy, K.L., Mahoney, S.E.: Towards Identifying Factors Underlying Readiness for Online Learning: An Exploratory Study. Distance Education 24, 57–67 (2003)
17. Moftakhari, M.M.: Evaluating E-learning Readiness of Faculty of Letters of Hacettepe. Unpublished master's thesis, Hacettepe University, Ankara (2013)
18. Aydın, C.H., Taşçı, D.: Measuring Readiness for E-learning: Reflections from an Emerging Country. Educational Technology and Society 8, 244–257 (2005)