

E-Learning Readiness of Turkish Medical Students: A Sample from Gazi University

Türk Tıp Öğrencilerinin E-öğrenmeye Hazırbulunuşluk Düzeyleri: Gazi Üniversitesi Örneği

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ABSTRACT

Objective: We are currently training a generation of students who cannot remember the days before Internet, are learning in digital environment, will practice in a predominantly e-health world. We think they are ready to learn online, but are they? The aim of this study was to determine the students' readiness for e-learning in terms of the technologies they have with the skills for online learning.

Methods: This is a descriptive study with survey method by using a scale of university students' readiness for e-learning. The research was done with volunteer 4th-year medical students.

Results: The results show that e-learning readiness for medical students is enough for five sub-scales, and almost enough for one sub-scale. The medical undergraduates have smartphones(92.3%), laptops(81.6%) and tablets(26.7%) only 0.9% of the undergraduates have no hardware. The participants have regular internet connection(92.1%) and mobile internet connection(80.89%). Male undergraduates' readiness is significantly higher than females. The undergraduates who use internet for studying and learning during the day or several times in a day have statistically higher readiness levels than others.

Conclusion: Medical students' e-learning readiness level is moderately high. They use Internet daily with own hardware. The organizational readiness is well in terms of resources, learning management systems.

Key Words: E-learning readiness, medical students, online learning

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ÖZET

Amaç: Günümüzde, internetten önceki günleri hatırlayamayan, dijital ortamda öğrenen, ağırlıklı olarak e-sağlık dünyasında çalışacak bir kuşağı yetiştiriyoruz. Bu bireylerin çevrimiçi öğrenmeye hazır olduklarını düşünüyoruz, acaba gerçekten hazırlar mı? Bu çalışmanın amacı, öğrencilerin çevrimiçi öğrenme becerileri ile sahip oldukları teknolojiler açısından e-öğrenmeye hazırbulunuşluklarını belirlemektir.

Yöntem: Öğrencilerin e-öğrenme hazırbulunuşluklarının "E-Öğrenme için Hazırbulunuşluk Öz Değerlendirme Ölçeği" kullanılarak yürütülen tanımlayıcı (betimsel) bir çalışmadır. Çalışmaya gönüllü 4. Sınıf öğrencileri ile yürütülmüştür.

Bulgular: Sonuçlara göre, tıp öğrencilerinin e-öğrenmeye hazırbulunuşlukları beş alt ölçek için de yeterli düzeyde ve bir alt ölçek için de kısmen yeterli düzeyinde tespit edilmiştir. Tıp fakültesi öğrencilerinin sahip oldukları teknolojiler; akıllı telefon (% 92,3), dizüstü bilgisayar (% 81,6) ve tablet (% 26,7) olup, % 0.9'u bu teknolojilerden hiçbirine sahip değildir. Öğrenciler yerel internet erişimine (% 92,1) ve mobil internet erişimine (% 80,89) sahiptir. Erkek öğrencilerinin hazırbulunuşluğu kız öğrencilerden anlamlı derecede yüksektir. Gün içinde veya günde birkaç kez eğitim ve öğrenim amaçlı interneti kullanan öğrencilerin hazırbulunuşluk düzeyleri, diğerlerine göre daha yüksektir.

Sonuç: Tıp öğrencilerinin e-öğrenme hazırbulunuşluk düzeyleri kısmen yüksektir. İnterneti günlük olarak ve kendi donanımlarıyla kullandıkları görülmüştür. Gazi üniversitesi bağlamında örgütsel hazırbulunuşluk açısından (öğrenme yönetim sistemleri ve e-kaynaklar) iyi düzeydedir.

Anahtar Sözcükler: E-öğrenmeye hazırbulunuşluk, tıp fakültesi öğrencileri, çevrimiçi öğrenme

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INTRODUCTION

We are currently training the generation of doctors who cannot remember a time before the internet, who will learn in an environment dominated by digital technologies and who will practise in a predominantly e-health environment. Our libraries' collections and learning sources are predominantly online and the medical students make significant use of the web and other electronic resources. There are two essential challenges that waiting us: how to make the best use of the digital technologies in medical education, and how to best configure medical education in a digital age. On the other hand, the rapid changes in medical sciences require the physicians to update their information continuously (1). Both the medical students and educators should follow the new topics and studies even they have a heavy workload, insufficient time and low motivation levels.

Using e-learning environments may give opportunities to learners such as anytime/anywhere, repeating enormously, progressing their own learning speed, and online resources and interactions about the topic etc. In improving student's performance and facilitating active learning, the studies which used technology in medical education as blended and online learning were found successful (2,3). Some students prefer to prepare assignments at home and may found it as a strong motivator (4). In the context of "lifelong learning" with "21st-century skills for today's learners", we tend to think they had digital literacy skills in using information and communication technologies (ICT) effectively current and in the future (5). However, it is important to determine the students' readiness for e-learning in terms of both the technologies, they have the skills for learning online.

The e-learning readiness is the ability of the organization or a learner to benefit from the advantages of ICT (6). It is a complex structure that consists of many elements including technological equipment (physical readiness) and technical skills (mental readiness) the students have. There are very different perspectives for e-learning readiness. We used the same structure of Hung et al's study (7).

The organization may set to work with e-learning radically but in the long term, it is important following a strategical plan and considering in taking measures with stakeholders' satisfaction (8). As long as learners and educators are not ready to learn online, it is inevitable related with wasted resources and investments. It is important to Determining the e-learning readiness of learners and improving the quality of learning by using ICT are the important points. We aimed to reveal how our undergraduates are ready for e-learning before online classes are presented.

It is important to assess their willingness and state of readiness before giving the classes online in order to get successful results in terms of the learning environment.

While determining the learners' e-learning readiness there are very different perspectives and models in the literature (7,9,10,11,12,13). According to Hung et al. , online learning readiness of college students has five dimensions (7): self-directed learning, the motivation for learning, computer/Internet self-efficacy, learner control, and online communication self-efficacy. This study used this model and explored the following research questions:

1. What is medical students' e-learning readiness?
2. What are their ICT ownership and usage situations?
3. Does the gender affect their e-learning readiness levels?
4. Does using the Internet for homework/studying affect their e-learning readiness levels?

MATERIALS and METHODS

Research Model

This is a descriptive study aimed to reveal the e-learning readiness of medical students by using a valid and reliable scale of university students' readiness for e-learning.

Participants

The 4th year medical students were selected as the study group and we aimed to reach all of them without sampling in May 2017. The ethical approval was taken from Clinical Research Ethics Committee of Gazi University. We selected this group because in the following year one of the 5th year clerkship will offer a flipped learning strategy. There is total of 398 medical students in 4th Grade.

Data Collection Tool

The e-Learning Readiness Scale (e-LRS) for students (14) has 33 seven-point Likert-type items under six factors as follows; computer self-efficacy (CSE- 5 items), Internet self-efficacy (ISE- 4 items), the online communication self-efficacy (OCSE- 5 items), the self-directed learning (SDL- 8 items), the learner control (LC- 4 items), and the motivation for learning (ML- 7 items). The below-generated assessment model (8) was adapted for 7-point Likert type and was used to interpret the findings as depicted in Figure 1.

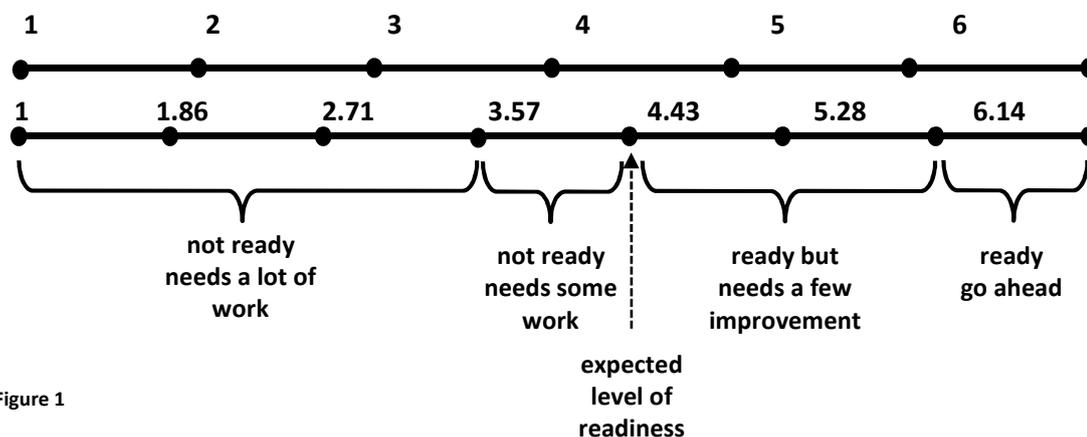


Figure 1
Assessment model for e-LRS (8)

The Cronbach's α reliability of the total items was .93 in original scale and for the factors, it changes between .84 and .95. The values in our study are; .97 for the total scale and for the sub-scales it changes between .93 and .98.

Data Analysis

The data were analysed with SPSS 17.0 (15) using descriptive (frequency, percentage, mean, standard deviation) and comparative statistical methods (independent samples t-test, one way ANOVA) with 95% confidence interval. The distribution of data and homogeneity of variances were tested before conducting parametric tests.

RESULTS

Although the survey was sent to all the participants, the study was done with 337 (84.7%) volunteer students who accepted to participate. The mean age of study group was 22.35 \pm .94 and, 55.2% of the group was female.

The results were presented according to the order of the research questions. We would like to answer the first one which was "What is medical students' e-learning readiness?". As it was seen in Figure 2, medical students seem ready for e-learning but they need a few improvements. Beside of this, their motivation for learning is below the expected level of readiness. The mean scores and percentages for each item score of the total scale was given in the appendix section of this paper. The detailed results can be seen there(appendix).

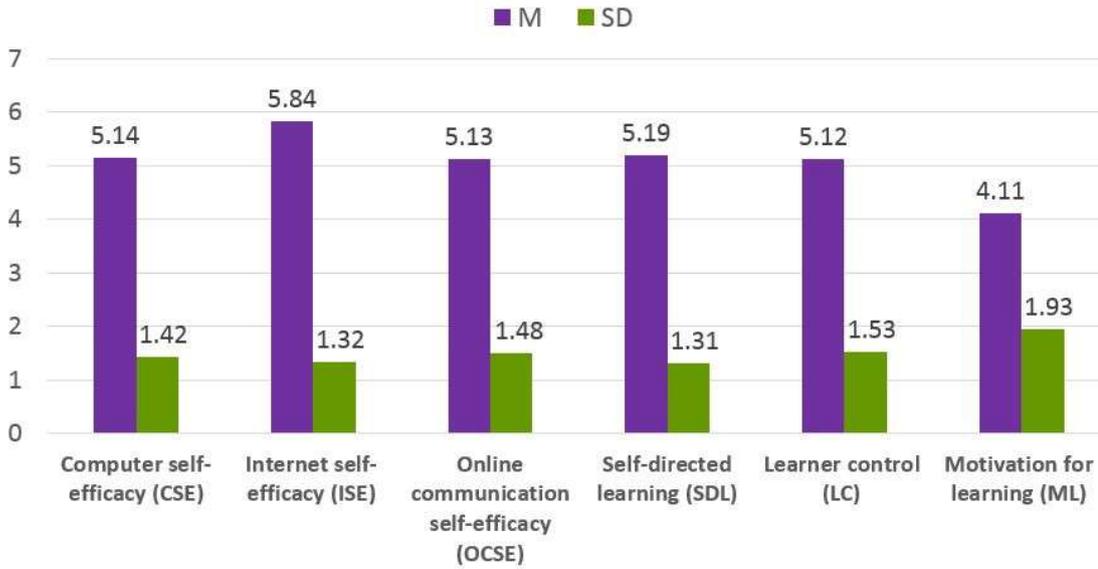


Figure 2

Medical students' e-learning readiness levels

The second research question was technology ownership and usage situations of the group and the results were given in several steps to get a perspective about the study group. The types of technologies that medical students have and their preferred places to use the Internet were addressed in Table 1.

We asked medical students about their Internet connection plans and the results were presented in Figure 3. Most of the students have an internet connection where they stay (92%) and mobile Internet plan (86%).

Table 1 Technology ownership and preferences

	n	%
<i>Type of the technology they have</i>		
Smartphone	321	95.3
Tablet	90	26.7
Laptop	275	81.6
PC	30	8.9
None	3	.9
<i>Where they prefer to use the Internet?</i>		
Home/Student hall	277	82.2
School	21	6.2
Internet cafe	8	2.4
Free Wi-Fi areas	46	13.6

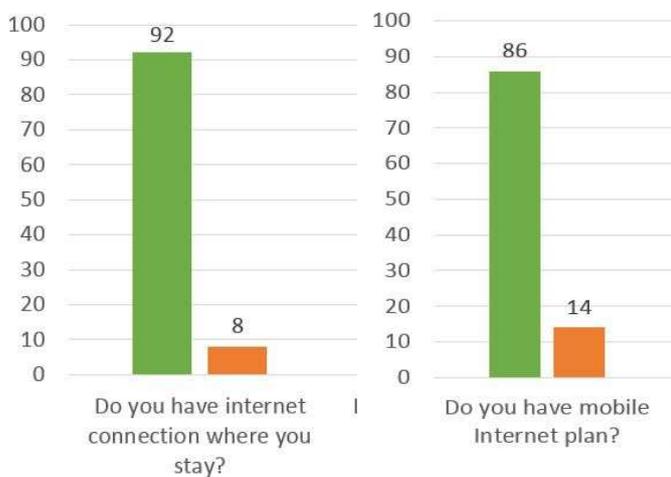


Figure 3

The existence of medical students' home (left) and mobile (right) Internet connection

In order to understand their Internet access, we created a cross table to see how many of the medical students have Internet connection and how many of them do not.

As we could see in Table 2, only 15 students (4.48%) have Internet access neither at home nor mobile, but many of the students (80.89%) have both at home and mobile Internet connection.

Their frequencies of Internet use in terms of the aim (homework/studying vs social media use) was depicted in Figure 4. Daily usage of social media is very high (85.6%) however daily usage for studying is at a moderate level (55.2%).

Table 2 Internet connection situations of medical students

Having Internet connection where they accommodate	Having mobile Internet connection					
	Yes		No		Total	
	n	%	n	%	n	%
Yes	271	80.89	32	9.55	303	90.44
No	17	5.07	15	4.48	32	9.55
Total	288	85.96	47	14.03	335	100

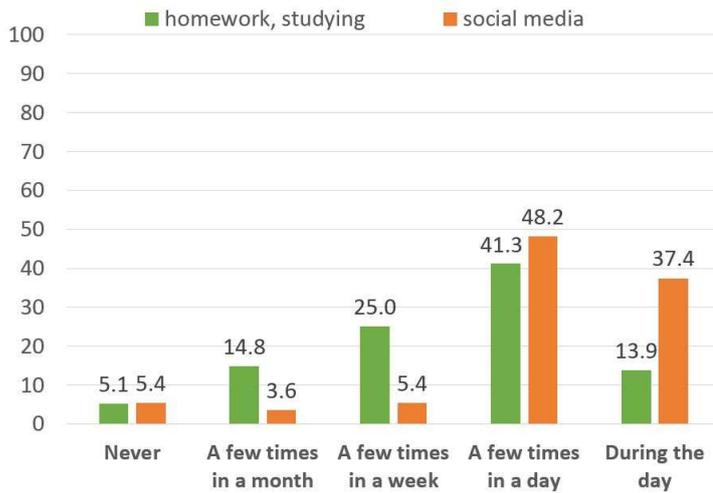


Figure 4

The frequencies of Internet use for different aims

The third research question was about gender and its effect on e-LRS scores. In order to test gender's effect on e-LRS, we analysed the results by using

independent samples t-test. As seen in Table 3, male students had significantly higher e-LRS scores than females in four factors (CSE, ISE, OCSE, and ML) of e-learning readiness.

Table 3 Medical students' e-LRS score differences in terms of gender

	Female (n=185)	Male (n=150)	df	t	p
Computer self-efficacy (CSE)	4.89	5.49	333	-3.982*	0.000
Internet self-efficacy (ISE)	5.66	6.10	333	-3.072*	0.002
Online communication self-efficacy (OCSE)	4.91	5.43	333	3.254*	0.001
Self-directed learning (SDL)	5.08	5.35	333	-1.919	0.056
Learner control (LC)	5.02	5.27	333	-1.506	0.133
Motivation for learning (ML)	3.83	4.74	333	-3.072*	0.002

*p < .05

The fourth research question was about academic Internet usage and its effect on e-LRS scores. In order to answer "Is using the Internet for academic purposes affect their e-LRS" question, we analysed the results by using one-

way ANOVA. As we see in Table 4, the increase in the time spent for studying via Internet increases the e-LRS scores significantly. In other words, the students who use the Internet for academic purposes during the day or a few times in a day got higher e-LRS scores than others who never use or who use a few times in a month.

Table 4 Medical students' e-LRS scores in terms of academic Internet usage

	(0) Never (n=17)	(1) A few times in a month (n=49)	(2) A few times in a week (n=83)	(3) A few times in a day (n=137)	(4) During the day (n=46)	F (4,327)	p	Significant differences
CSE	4.79	4.64	4.89	5.38	5.75	5.940*	0.000	1<3,1<4,2<4
ISE	5.65	5.24	5.79	6.03	6.31	5.369*	0.000	1<3,1<4
OCSE	4.47	4.70	5.05	5.32	5.55	3.593*	0.007	1<4
SDL	4.54	4.66	5.11	5.39	5.60	5.485*	0.000	0<4,1<3,1<4
LC	4.09	4.36	5.11	5.46	5.55	8.564*	0.000	0<3,0<4,1<2, 1<3,1<4
ML	2.94	3.58	4.14	4.20	4.95	5.000*	0.001	0<4, 1<4

* $p < .05$ CSE: Computer self-efficacy, ISE: Internet self-efficacy, OCSE: Online communication self-efficacy, SDL: the self-directed learning, LC: Learner control, ML: Motivation for learning

DISCUSSION

In this study the aim was to investigate medical students' predisposition with using online learning environments. This study was conducted to determine their e-learning readiness levels, their ICT ownership and usage situations. The independent variables were the gender and the academic usage of Internet on e-learning readiness levels.

An acceptable level was found for e-learning readiness at undergraduate medical students. However, their motivation for learning is a bit lower than other subscales. Medical students' highest readiness factor is Internet self-efficacy and the lowest readiness factor is motivation for learning. This result is very similar to the faculty of education students in a very recent Turkish study (16). In an Iranian study, postgraduate medical students had good readiness in different aspects of e-learning but the "motivation" subscale was less than others (17). In a Puerto Rico study, medical residents were found ready to engage in an online program because of having a good level of technical and self-directed learning skills (18).

If we conduct need assessment before the online learning and then design the training sessions according to these needs; the understanding of online learning would improve (19). On the other hand, if the course outcomes will be useful in real life, if we visualize the learners' success, if we create an online environment with good communication between all participants, if we make the learners active during the course then their motivation could be enhanced with these efforts (13,17). Monitoring the learners' progress actively and planning regular deadlines may motivate the students to complete the online course (20).

The studies conducted before in Turkey show that, undergraduate students are ready for e-learning in terms of having technological hardware and Internet connection(14,16,21). There are very few students who do not have an Internet connection at their living place. Some of the students have a limited Internet connection. For the students who would prefer to study in the faculty, power sockets (22,23) and Wi-Fi connections (22) should be provided. Our faculty has to offer at least 50 free access points either. Having computer and Internet connection in the living place affects the perceived usefulness and perceived ease of use due to technology acceptance model with e-learning readiness(24).

Many of the medical students have smartphones (95%). According to a study with nursing students, in terms of self-directed learning readiness, mobile phone-based discussion offers valuable and flexible learning opportunities compared to the computer-based discussion (25). If we provide them mobile-based learning management systems and mobile discussion interfaces, they may prefer to use these environments.

Many students have more than one technology to connect to the Internet within 5-7 years, it will be ordinary for a person to use two or three computers or wearable technologies connecting to Internet (22).

According to frequencies of Internet use, it seems that the students who have any time- anywhere, Internet (85.96%) usage would be for social media (85.6%) daily. However daily usage for studying is at moderate level (55.2%), weekly usage is at quarter level (25%) and monthly usage is very low (14.8%).

These finding may be explained by medical students' studying preferences (deep vs surface), learning styles or characteristics.

The e-LRS is high for the students who use Internet for academic purposes. In a very recent study, 94% of medical students said they have used social media for educational purposes (26). A study result claim that e-learning readiness have consisted of two sub-factors as technology usage self-efficacy and learner autonomy (27). The students should be familiar with the programs, apps, tools and online learning environment (23). Developing digital competencies is important for medical students' self-efficacy and setting their goals, planning their study hours under learner autonomy. There are many information on the web and, the medical students should learn the managing skills of selecting the related and important sources for memorizing (1). A study found that the students who used web 2.0 tools for learning, they experienced self-directed learning (SDL) with technology effectively and the SDL readiness was an important predictor of SDL with technology (28).

There was no difference according to gender in some studies (7,17,23). On the other hand, some of the previous studies highlighted gender disparities in medical students to use health information technology tools. Even though female students had prior experience with using tools about health information technology with similar computer capabilities in males, they scored low level of technology readiness than males (29,30) or computer literacy skills (31). In terms of e-LRS scores, a male-female difference was found in this study in favour of male students. This difference can be result of the female undergraduates tendency in underestimating their computer skills (32). Also, the readiness levels of females could be affected positively with support (29).

Gazi University, Distance Education Center is very competent in terms of infrastructure and personnel competence as part of the organizational readiness. Some of the departments at our faculty are planning to start e-learning for theoretical courses with meeting with students in only practice hours for discussing and implementing the online content. On the other hand, in teaching clinical skills ,the flipped classroom could be used because it engages students with the resources with allowing them to gain skill mastery, improve attitudes and professionalism (33).

The readiness of the academicians should also be investigated before starting with the online learning activities (16,17). Because the e-learning readiness was correlated with computer competency(ICT skills) among medical instructors(34). The instructors should have technological skills and competencies of using web tools. They would have the basic knowledge on using a learning management system (LMS), designing online courses , creating e-learning materials, having positive attitudes toward technology, and forming technical habits (34). Faculty development programs (35) should be imparted to make the instructors gain these skills.

The e-learning is not only broadcasting the electronic documents; it requires a pedagogical approach which is flexible and learner-centered. There should be intertwining interaction between student-teacher and student-student, with collaboration and communication tools (36). It is important taking a serious look to e-learning readiness for decreasing the failure risk of e-learning solutions (34).

In order to be successful in e-learning integration, the organizations are needed strategies to reduce the change's resistance (6). For getting the real outputs, the online programs should start with a pilot testing group and a course (18). The evaluation of e-learning readiness of all stakeholders will present dimensions to be considered in e-learning and identifying the goals to be achieved (6).

This study has some limitations. First, the findings couldn't be generalized related with being only one Faculty of Medicine's data in Turkey. Regarding future work, each faculty or organization should be evaluated with own students and educators because of having different socioeconomic backgrounds and profiles. The results would provide information about readiness level of partners before implementing e-learning. According to these results, a detailed and cogent action plan would be made by the organization. Second, the data was collected as self-report with relating scales, technology acceptance or individual innovativeness levels could be considered in future studies to reveal a complete profile.

In conclusion, medical students of Gazi University are ready for learning online but we need to enhance their motivations. They have enough technologies for regular Internet access. They already use Internet for their academic learning process. We should consider the factors to increase their motivations for online learning.

Conflict of interest

No conflict of interest was declared by the authors.

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