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Nursing students Preparedness and Barriers towards E-learning at king Abdulziz University

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Abstract:
Background: *E-learning exploits interactive technologies and communication systems to improve the learning experience. It has the potential to transform the way we teach and learn across the board. It can raise standards, and widen participation in lifelong learning.*
Aim of the study: *was to assess nursing students' preparedness and barriers towards E-learning as an educational strategy.*
Subjects and Methods: Research design: *mixed methods cross sectional design) was adopted to carry out this study.*
Setting: *The study was conducted at faculty of nursing king Abdulziz University.* ***Subjects****: 142 nursing students who registered at adult health (purposive sample) during the first semester of the last academic year (2018).*
Tools of data collection: *Two tools were used for data collection. Tool (I): Students' Structured Questionnaire. Tool (II): Focus Group Discussion Guideline. In addition to the socio-demographic characteristics.*
Results: *Statistically significant difference was found regarding students having computer skill and the ability to learn autonomously, also, regarding students having computer, Learner- content-interaction and Learner-instructor-interaction and Learner-Learner-interaction. A statistically significant difference was found also between students who previously studied with E-Learning and Staff interaction with E-learning and regarding students having computer and the overall dimensions of E-learning. However, negative correlation was found in staff interaction.*
Conclusion: *There were many advantages of IT preparedness and barriers regarding learner, instructors, content as well as technical barriers in adopting E-learning in nursing faculties.*
Recommendations: *training programs needed to increase awareness of all faculty members' regarding digital technologies and the diversity of context.*
Keywords: *E-Learning, Technology barriers of E-learning.*

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I. Introduction

Learners in higher education learns through innovation, comprehensive and advanced methods of teaching. Especially by the use of advanced Information Technology (IT) which created a need for E-learning [(1)]. The combination between synchronous and asynchronous instruction can simply be considered E-learning [(2)]. Expressions such as online learning, virtual learning, Web-based learning, and distance learning are used extensively in E-learning [(2)]. One of the unique Using of E-learning strategies that it's aimed to expose the students to various models of Learning. one of them is the constructivism model, instead of only using of traditional learning [(1)]. Resources enriched education implemented through the inclusion of text, audio, video, and animation into course lectures; retrieving information from online journals, periodicals, and newspapers; including simulations and multi-media presentations in the classroom; enhancing communication and collaboration between professors and students and uploading course content and tests to university websites [(3)].

E-learning to learners can be done in various ways wither in as an asset in traditional classrooms. In addition, it can be offered as in blended learning modules as a combination of traditional and E-learning. Also, there is a second model which is the online learning which offers total independence to learners. This third model is divided into individual and collaborative learning with the second option being sub-divided again into synchronous and asynchronous learning [(1, 2)].

Moreover, E-learning can be used whether for training or education in or outside of the educational institution. E-learning refers to the complete management of learning as in the terms Learning Management System (LMS) and Learning Content Management System (LCMS), E-learning facilitates self-learning, lifelong learning and personalization [(4)].

Eight dimensions were proposed by Khan to E-learning: pedagogical, technological, interface, evaluation, management, resources support, ethical, and institutional. Each dimension had sub-dimensions covering specific aspects of the E-learning environment [(3)]. E-learning can be sorted according to the range of its utilization in education or the timing of interaction. Computer-based learning and internet- based-learning are different types of E-learning. Moreover, templates are prepared to assist educators to put contents, and upload sheets to students [(2)].

E-learning suits the current learners as students have passion to active learning, positive learning context, and access to latest updates in science, availability of resources 24 hours a day and 7 days a week on an enjoyable way considering individual difference among learners. Staff or administrator's personnel shortage can be overcome through the extensive use of E-learning. This can be implemented in as registration, classroom management, and evaluation, facilitates communication and enhances the relationships that support learning [(5)].

Learners and educators should be acquainted to ICT and E-learning. Through it they can be updated with the latest in science. Educators can instruct greater numbers of learners. They can use interactive learning strategies with concern of difference in learning styles. Learners can deal with their instructors anytime. Regarding the assessment of student's needs and achievements they can get immediate feedback [(2, 6).]

E-learning enrich teaching and learning environments; it can also help students and institutions in terms of course availability, affordability, and convenience" [(7)],time and being in the same place as constraints has been resolved in e learning [(3)]. Integration between theoretical knowledge and practical skills can be performed through using advanced forms include e-mail, videoconferences, virtual classrooms, discussion groups, forums, digital learning materials, virtual laboratories, simulations and similar [(8)].

Learners are subjected to unlimited resources of science [(9)]. Through E-learning, learners can experience numerous learning approaches other than traditional ones. E-learning curriculum could push students to participate in ways not previously possible in face-to-face curriculum, and create new learning and teaching opportunities that will generate greater outcomes [(10)]. Different learning experiences are presented according to different learners' preferences, as well as the type of learning materials during the design process [(2)]. E-learning and computer mediated communication is used extensively nowadays. This may be happened because educators have high expectations regarding it particularly concerning the obstacles that are facing traditional education [(11)].

Moreover, lack of clarification of content materials, uncertainty on how to measure teaching quality and little interest in co-operation between E-course developers [(12)]. Some researchers reported the students' isolation as persevered by the learners [(11)].

Significance of the Study:

The researchers faced a problem of increased student numbers in face of limited nursing faculties, shortage of staff members during the clinical experience with the faculty of nursing second year students in medical surgical nursing department, leading to increasingly large lectures, and therefore decreasing interaction and collaboration, which are important factors for individual learning success consequently, there was a need to find alternative ways to solve this problem. Besides that the researchers wanted to introduce innovative, self-pacing and interactive methods in teaching that make students enjoy autonomous learning.

Aim of the study:

The aim of the study was:

To assess nursing students' preparedness and barriers towards E-learning as an educational strategy.

Research questions:

What are the level of nursing students preparedness and barriers for implementing E-learning?

Subjects and Methods:

Research design:

A descriptive mixed method correlational study design was adopted to carry out this study.

Study Setting:

The study was carried out at medical surgical nursing department, faculty of nursing king Abdul-Aziz University.

Study Subjects:

It included all undergraduate students in 2nd year who were enrolled in adult health nursing course of the academic year 2018 during the first term. The total sample of the study was 142 students.

Tool for data collection:

In order to fulfill the objectives of the study two tools were used to collect necessary data:

Tool I: Students' Structured Questionnaire. Part 1. Students personal and computer related data: It was developed by researchers to identify basic students‟ personal and academic data such as: age, having computer, previously studied with E-Learning, and technical computer skills.

Part two: a self-reported questionnaire, was developed by researchers based on the review of related literature related literature [1, 2, 5] to investigate students Preparedness towards E-learning in their education. It was consisted of five dimensions: Learner-content-interaction in e-learning (15 items), the ability to learn autonomously through e-learning (8 items), Learner-learner-interaction in E-learning (7 items), Learner-instructor-interaction in e-learning (6 items) and barriers (interaction with instructors) in adopting e learning (11 items).

Scoring system:

The response to those items were scored on a 5 –points Likert scale (1 = strongly disagree, 2= disagree, 3= neutral, 4= agree and 5= strongly agree.) Reversed score was taken into consideration. The cumulative Preparedness score was ranged from 0 to 15. The scoring system was as follows: Low Preparedness score: < 50% = (<8) Moderate Preparedness score: %50 %-< 75% = (8-11) High Preparedness score: ≥75% (11-15)

Tool II: A **structured Focus Group Discussion Guideline (FGD) was** adapted after extensive reviewing of references [1-3]. Focus group interview was performed to explore main barriers in implementing E-learning.

Content Validity and Reliability:

Content validity for Tool (I) and (II) was established by jury of five experts' professors from Nursing Education Department. Accordingly, necessary modifications were done.

Tool (I) was tested for reliability using Cronbach's alpha. The values were revealed as follow the ability to learn autonomously through E-learning (0.856), Learner- content- interaction in E-learning (0.908), Learner-instructor- interaction in E-learning (0.917), Learner-learner- interaction in E-learning (0.935), barriers (interaction with instructors) in adopting E-learning (0.709) and overall reliability (0.921).

Data collection:

Data were collected through self- administered questionnaires that were

Distributed among the 2nd academic

Year nursing students 2018 during the first term semester. Each subject took a period around 25 minutes.

Pilot study:

Pilot study was conducted on 15 (10 %) of students and they were excluded from the total number of students to insure the clarity and comprehensiveness of the tool.

Administration and Ethical consideration:

- Ethical Approval from faculty of nursing king Abdul-Aziz University. was obtained to carry out the study
- Meetings were held with the researchers and facilitators involved to verify tasks and forms needed to be used.
- Tool (I) and (II) were developed by the researcher after reviewing the recent relevant literature.
- All students were informed about the purpose of the study and given brief explanation; oral informed consent was obtained from each of them.
- The right to refuse to participate or withdraw from the study was emphasized after reassuring students that response would have no impact on grades.
- Data Anonymity and confidentiality were considered.

For Focus group interview:

- Permission was taken from the faculty to get one classroom to conduct the focus group on medical surgical nursing students, to investigate 2nd year nursing students' preparedness and barriers towards E-learning as an educational strategy.
- Focus group interview, 20 students divided into four groups each two groups supervised by one facilitator.
- Sub-topics were selected to make up the focus group. Each group assigned one topic as positive aspects to E-learning and blended learning, challenges, barriers, requirements and suggestion to success using open-ended question.
- The facilitator asked questions of the group and allowed time for participants to respond to each other's comments. The focus group guide serves as a "road map" and memory aid for the facilitator.
- Focus group guide will be used for each focus group.

- Role of each one in the Focus group was specified as to follow:

a- The role of the facilitator was to keep the group focused on the topics for discussion. The facilitator guides the group through the discussion.

b- The researchers identify how comments were said; and record when transitions occurred from one topic to the next.

c-Another student was responsible for recording the focus group. The recording will be used to create a transcript of the event.

- The focus groups took 45–50 minutes for each group.
- After finishing the focus group, the facilitator retrieve notes from the note taker, recorded focus group commentaries and made interpretation for the asked questions.

Statistical Analysis:

The collected data were coded and analyzed by using the Statistical Package for Social Sciences (SPSS) software version 20.0. Data was tabulated and presented using various of tests: frequency, calculation of the mean, standard deviation, Pearson chi square, t tests were used in the analysis, chi-square and Mont Carlo exact probability test was used to study the significance of the difference between proportions. The cutoff point for statistical significance was $P \leq 0.05$.

II. Results

Table (1): Demographic characteristics, computer experience of Nursing students (n=142) with age ranged from 20: 22 years old. The majority of them had computer, (64.8%) of them previously studied with E-Learning and more than half of them had intermediate technical skills in using computer.

Table (2): Distribution of the Students According to description of different E-learning preparedness dimensions. It could be observed from the table that, The ability to learn autonomously through E-learning and Learner-learner-interaction. in E-learning half of the studied sample (50%) had high score in each one of the two dimensions with mean and standard division (28.8 ± 6.2) (24.7 ± 7.4). Followed by, more than one quarter of them (26.1%) had high score concerning Learner-instructor-interaction in E-learning dimension with mean and standard division (21.7 ± 7.0). Whereas, only 2.8% of them had high score concerning Staff interaction with E-learning with mean and standard division (27.5 ± 5.1). Only one tenth (10.6%) of the studied sample had high score concerning the total E-learning Preparedness1 with mean and standard division (58.5 ± 25.4).

Table(3): Demonstrated the relationship between the ability to learn autonomously through E-learning dimension and demographic characteristics as it was found that, a statically significant difference regarding students having computer and the ability to learn autonomously through E-learning as they were higher autonomously. No statically significant difference were found regarding students' age, and Previously studied with E-Learning or Technical skills.

Table (4): shows the relation between Learner- content-interaction in E-learning dimension and demographic characteristics, also it was found that, a statically significant difference regarding students having computer and Learner- content-interaction as students. As students having computer showed more interaction with content.

Table (5): explained, the relation between Staff interaction with E-learning dimension and demographic characteristics. a statically significant difference was found regarding students who previously studied with E-Learning and Staff interaction with E-learning. As students previously studied with E-Learning was more interactive with their staff members.

Table (6): demonstrated the relation between the overall E-learning dimensions and demographic characteristics. a statistically significant difference was found regarding students having computer and the overall dimensions of e-learning.

Table (7): Shows Correlation matrix between the overall E-learning dimensions as it was found that, a significant positive intermediate correlation between different preparedness' dimensions. However, negative correlation was found in staff interaction.

III. Discussion

E-Learning has been increasingly used as a method of teaching to overcome some high education problems such as large numbers of students. Ebadi, et al [(14)] stressed that untraditional teaching methods particularly computer-based learning introduce new chances in education especially in nursing field. It is worth

mentioning here, Sajeva. [15] declared that interactive learning is achieved, through planning and implementation of E-learning strategies throw-out the program. Different kinds of E-learning are present and implemented everywhere. Cigdemoglua et al [16] stated that those which provide means of interaction among learners themselves and between them and their educators are considered more accepted.

The current study, revealed that there is significant difference among those who scored high Learner-learner-interaction in E-learning, as perceived by the students. This can be explained as students nowadays are interested in computer, technology and internet in addition to social media. So that, they found E-learning as perfect method to interact with their colleagues. The same result was found by a jordanian [17], there were significant differences in student interaction. Also, researchers [18] in KSA, who reported that there is significant difference in student's interaction. In addition to others [16] who observed more learners' interaction in E-learning group.

In the present study having computer and different dimensions, regarding the autonomy dimension, learner content interaction, learner instructor interaction and learner – learner interaction were significantly difference with those who had No computers. This can be explained as having computer gives the learner the chance to have access to E-learning and overcomes barriers. Interestingly, in the Saudi study[18] , the results showed statistically significant differences in the autonomy dimension attributed to previous E-learning in favor of those who had no previous experience whilst interaction with instructors was favorable for those who confirmed previous experience, researchers [19]. [20] Stated that students need to take charge of their learning in order to enhance their autonomy as students. Recently, there is shift in the research that has brought an increased interest in the students themselves as learners in general.

In previous studies ([21] [22] it was observed that, the students had an opportunity to interact with teachers and peers and perceived connection in the learning process Regarding, Learner- content-interaction in E-learning owning computer significantly affecting this dimension. Similarly, other authors (23) in a study on E-learning in Somalia found that for the majority of students, being able to take responsibility for own learning increased their motivation. Many students reported feeling more active and engaged in the studies. The online medium allowed the students to discuss, share opinions and knowledge, and ask more questions than they could before. [23].

In addition to, study sample who didn't appreciate previous experience in E-learning to be significant in any other studied domain. The current finding can be explained as the present study sample experiences in E-learning are lacking and can't be considered as rich experiences. Moreover, in current university there are no formal E-learning courses. This is congruent with what was found in another Saudi research [24] study who concluded that there was no effect on E-learning from previous experience with E-learning. Whereas, in the present study, regarding Staff interaction affected significantly by previous studies with E-learning significantly. This can be explained that, whilst the studied sample had previous E-learning experience they can interact effectively with their instructors,[19]. Nevertheless, this result was contrary to others [18] who reported that in learner interaction with the instructor the impact of previous experience of dealing with E-learning was to enhance interaction. These two findings, together, indicate the value of training, skills and experience in E-learning [18].

Moreover, in the current study it was detected that the students perceived ICT Skills was not significantly affecting any domain except Learner-learner-interaction domain. This can be explained as learners' skills were perceived and reported by them. Moreover, no formal training regarding ICT skills is available for them. In Saudi study [18], the demographic data also showed a statistically significant difference in the autonomy dimension attributed to ICT skills, such that learners who described themselves as advanced users accorded autonomy the highest ratings. This confirmed the relevance of ICT skills to autonomy in E-learning. It could be that skilled persons can be more independent in E-learning than others feeling less need for supervision or technical support [18]. Some of the students stated that they sometimes lacked pedagogical support in terms of immediate interpersonal communication and feedback from the teachers. According to the students, the library is currently the only available pedagogical support [23]. This result agrees with other Saudi study [23], which showed the effect of experience in technology on interaction with E-learning. There were statistically significant differences in the autonomy dimension attributed to the presence or absence of previous E-learning, showing higher ratings amongst those without previous experience. In interaction with the instructor, the converse was the case with findings in favor of those who had previous experience. Finally, there were statistically significant differences in the autonomy dimension attributed to the ICT skills of those who rated themselves as skilled and the same was found by others[25]. The assigned technical support is, however, inadequate since the students only had one person to turn for help, and when that help was unavailable, the students were left to their own devices. This was reported to affect their learning experience negatively. The students also mentioned that there was a need for trained technical staff that could help them with specific E-learning issues and the same was found in . [24].

This is consistent with Higgins who mentioned that the availability of E-learning anytime, anywhere depended on both the availability of advanced technology and that of an appropriate place to study [25]. The same was found by Yang and Cornelius [26] examined positive and negative experiences of students regarding the quality of online learning. Factors that contributed to students' negative experiences were delayed feedback from instructors, unavailability of technical support from instructors.

Lastly, adoption of E-learning is promising educational strategies but it has many challenges and barriers regarding learner, instructors, content and technical. Faculty administration should try to overcome these barriers to get better educational quality.

IV. Conclusion

The current study findings concluded that there was a significant positive correlation among different E-learning preparedness dimensions and there were many advantages and barriers regarding learner, instructors, content and technical barriers in adopting E-learning in nursing faculties.

V. Recommendation:

Based on findings, the study recommended:

1. Introduce good quality internet in the faculty, with adequate training to both instructors and students.
2- Introduce training program for increasing awareness of all faculty members' digital Technologies and the diversity of contexts
3- Promote ICT skills of the nursing students.
4- Provision of E-learning and blended courses wherever possible in nursing education.
5- Further studies to evaluate the effect of E-learning on nursing education.

Table (1): frequency distribution of the Students according to their demographic characteristics, computer experience of Nursing students (n=142)

Characteristics	No	%
Age		
20-	30	21.1%
21-	71	50.0%
22	41	28.9%
Have computer		
Yes	124	90.5%
No	13	9.5%
Previously studied with E-Learning		
Yes	92	64.8%
No	50	35.2%
Technical skills		
Beginner	38	26.8%
Intermediate	79	55.6%
Excellent	25	17.6%

Table (2): frequency distribution of the Students according to E-learning Preparedness dimensions (n=142)

El-Learning Preparedness		No	%	Mean ±SD	α-Cronbach's
The ability to learn autonomously through e-learning	Low	10	7.0%	28.8 ± 6.2	0.854
	Moderate	61	43.0%		
	High	71	50.0%		
Learner-content-interaction in e-learning	Low	11	7.7%	55.9 ± 11.1	0.937
	Moderate	79	55.6%		
	High	52	36.6%		
Learner-instructor-interaction in e-learning	Low	36	25.4%	21.7 ± 7.0	0.816
	Moderate	69	48.6%		
	High	37	26.1%		
Learner-learner-interaction in e-learning	Low	25	17.6%	24.7 ± 7.4	0.883
	Moderate	46	32.4%		
	High	71	50.0%		
Staff interaction with E-learning	Low	70	49.3%	27.5 ± 5.1	0.796
	Moderate	68	47.9%		
	High	4	2.8%		
Total	Low	17	12.0%	158.5 ± 25.4	0.834

Moderate	110	77.5%
High	15	10.6%

Moderate: Score % 50%-<75% High: Score % > 75% Low: Score % < 50%
* P < 0.05 (Significant)

Table (3): Relation between the ability to learn autonomously through E-learning dimension and demographic characteristics (n=142)

Characteristics	The ability to learn autonomously through E-learning						MCP
	Low		Moderate		High		
	No	%	No	%	No	%	
Age							
20-	2	6.7%	13	43.3%	15	50.0%	0.953
21-	4	5.6%	31	43.7%	36	50.7%	
22	4	9.8%	17	41.5%	20	48.8%	
Have computer							
Yes	3	2.4%	54	43.5%	67	54.0%	0.001*
No	7	53.8%	5	38.5%	1	7.7%	
Previously studied with E-Learning							0.578
Yes	8	8.7%	39	42.4%	45	48.9%	
No	2	4.0%	22	44.0%	26	52.0%	
Technical skills							
Beginner	4	10.5%	14	36.8%	20	52.6%	0.359
Intermediate	5	6.3%	32	40.5%	42	53.2%	
Excellent	1	4.0%	15	60.0%	9	36.0%	

MCP: Mont Carlo exact probability
* P < 0.05 (Significant)

Table (4): Relation between Learner- content-interaction in E-learning dimension and demographic characteristics (n=142)

Characteristics	Learner- content-interaction in E-learning						MCP
	Low		Moderate		High		
	No	%	No	%	No	%	
Age							
20-	3	10.0%	17	56.7%	10	33.3%	0.246
21-	4	5.6%	45	63.4%	22	31.0%	
22	4	9.8%	17	41.5%	20	48.8%	
Have computer							
Yes	7	5.6%	67	54.0%	50	40.3%	0.002*
No	4	30.8%	8	61.5%	1	7.7%	
Previously studied with E-Learning							
Yes	7	7.6%	54	58.7%	31	33.7%	0.590
No	4	8.0%	25	50.0%	21	42.0%	
Technical skills							
Beginner	3	7.9%	25	65.8%	10	26.3%	0.649
Intermediate	6	7.6%	41	51.9%	32	40.5%	
Excellent	2	8.0%	13	52.0%	10	40.0%	

MCP: Mont Carlo exact probability
* P < 0.05 (Significant)

Table (5): Relationship between Staff interaction with E-learning dimension and demographic characteristics (n=142)

Characteristics	Staff interaction with E-learning						MCP
	Low		Moderate		High		
	No	%	No	%	No	%	
Age							
20-	19	63.3%	9	30.0%	2	6.7%	0.075
21-	34	47.9%	37	52.1%	0	0.0%	
22	17	41.5%	22	53.7%	2	4.9%	
Have computer							
Yes	64	51.6%	56	45.2%	4	3.2%	0.236
No	4	30.8%	9	69.2%	0	0.0%	
Previously studied with E-Learning							
Yes	48	52.2%	44	47.8%	0	0.0%	0.020*
No	22	44.0%	24	48.0%	4	8.0%	
Technical skills							0.322

Beginner	22	57.9%	16	42.1%	0	0.0%
Intermediate	37	46.8%	40	50.6%	2	2.5%
Excellent	11	44.0%	12	48.0%	2	8.0%

MCP: Mont Carlo exact probability * P < 0.05 (Significant)

Table (6): Overall E-learning dimensions and demographic characteristics (n=142)

Characteristics	Total						MCP
	Low		Moderate		High		
	No	%	No	%	No	%	
Age							
20-	5	16.7%	20	66.7%	5	16.7%	0.091
21-	5	7.0%	62	87.3%	4	5.6%	
22	7	17.1%	28	68.3%	6	14.6%	
Have computer							
Yes	10	8.1%	99	79.8%	15	12.1%	0.001*
No	7	53.8%	6	46.2%	0	0.0%	
Previously studied with E-Learning							
Yes	13	14.1%	67	72.8%	12	13.0%	0.196
No	4	8.0%	43	86.0%	3	6.0%	
Technical skills							
Beginner	6	15.8%	30	78.9%	2	5.3%	0.549
Intermediate	9	11.4%	59	74.7%	11	13.9%	
Excellent	2	8.0%	21	84.0%	2	8.0%	

MCP: Mont Carlo exact probability
* P < 0.05 (Significant)

Table (7): Correlation matrix between the overall E-learning dimensions (n=142)

	The ability to learn autonomously through E-learning	Learner- content-interaction in E-learning	Learner-instructor-interaction in E-learning	Learner-learner-interaction in E-learning	Staff interaction with E-learning
The ability to learn autonomously through E-learning	1	.691**	.452**	.438**	-.154
Learner- content-interaction in E-learning		1	.581**	.549**	-.236-**
Learner-instructor-interaction in E-learning			1	.628**	-.189-*
Learner-learner-interaction in E-learning				1	-.264-**
Staff interaction with E-learning					**1**

*: P < 00.05
**:P<0.001

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