Relationship between Computer Literacy and E-Readiness Among Students in the Covid-19 Pandemic

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ABSTRACT

Background: In the wake of the pandemic, many parts of the world have shifted entirely to e-learning. Accordingly, universities refused to offer in-person sessions and launched virtual classes instead. This study aimed to investigate the relationship between computer literacy and e-readiness among students.

Methods: In this cross-sectional study, 100 eligible female students at Yazd University in Iran were selected by means of convenience sampling. They were in the 19-21 age group and received a physical education course in the first semester of the 2020-2021 academic year. The classes were held in a virtual setting. Data collection tools were a standard computer literacy questionnaire focusing on seven ICDL standard skills, and Watkins standard questionnaire for evaluating students' e-readiness. SPSS-23 was used to analyze the data. Descriptive statistics and the Spearman correlation coefficient were used, and the acquired P-value<0.05 was considered as the significance level.

Results: There is a significant and strong relationship between computer literacy and e-readiness only in the subscale of skills and communication (0.04), but there is no significant relationship between computer literacy and other subscales of e-readiness, such as motivation (0.96), access to technology (0.68), learning ability (0.86), internet group chat (0.96), and important issues for successful learning (0.6).

Conclusion: The findings of this study showed that there is a significant relationship between computer literacy and e-readiness only in the subscales of skills and communication. There is no significant relationship between computer literacy and other subscales of e-readiness. Having these skills helps the learner to acquire information and knowledge. University policymakers and planners need to pay special attention to improving computer literacy skills and increasing students' e-readiness.

Keywords: Computer literacy, Covid-19 Pandemic, E-Learning, E-readiness

Introduction

The World Health Organization declared the coronavirus disease (Covid-19) as a pandemic on March 11th 2020 (1). One way to control and prevent the spread of this disease is to stay at home, avoid daily physical interactions, and self-quarantine (2). This crisis has affected education systems in all countries of the world and has led to the closure of courses in schools and universities (3). Instead of cancelling their curricula, many universities have encouraged professors to offer teaching materials and assess learning through distance and online education (4). Due to growing concern about the pandemic, most universities in all regions changed the curriculums or cancelled in-person programs such as conferences, courses, physical activities, and other events that needed gathering. They had to rapidly modify and adapt to this situation (5). E-learning can be defined as a different form of education involving more effective communication between teacher and learner through communication technology (6). This mode of learning is not usually planned in advance and involves a sudden shift from traditional teaching to a remote one in view of emergency situations like the coronavirus outbreak in different countries. E-learning in the present age has undoubtedly brought about fundamental changes in the methods of learning and teaching (7).

E-readiness means the ability of organizations and the capacity of educational stakeholders (managers, key people, professors, and students) to participate in a Virtual Learning Environment. Assessing e-readiness allows officials and policymakers to adopt appropriate policies and plan development strategies to create a balanced and equitable environment for e-learning.

In this regard, the readiness of human resources, especially the level of computer literacy among students and professors, has a special priority and importance (8). Computer literacy is the ability of a person to use computers and information technology. These seven skills, called the ICDL course, derived from the words "International Computer Driving License," meaning "International Computer Driving Course," are familiarity with the basic concepts of Information Technology (IT) (9).

According to previous research in the field of computer literacy and e-readiness on university students, it was found that students in some universities did not reach a favorable level in the field of computer literacy (10-12). On the other hand, some researchers reported that students were at a good level in terms of computer skills (13, 18, 19). This challenge prompted us to assess the level of computer literacy and e-readiness of students who were required to use computers or e-learning devices during the pandemic.

It is obvious that the educational systems in different countries are facing changes as a result of the spread of the Covid-19 pandemic. Therefore, in order to implement e-learning, it is necessary for universities to be aware of the current situation and the ability of students to use computer skills in order to facilitate the virtual learning path. In this regard, this study sought to investigate the level of computer literacy and e-readiness of Yazd University students during the prevalence of Covid-19. The findings of this study can provide the necessary knowledge to the administrators of this university in order to eliminate the shortcomings and improve students' education level.

Methods

Study Design

This research is a cross-sectional and correlational study.

Setting

The study involved the inclusion of 400 female students who studied in the first semester of the academic year 2020-2021 at Yazd University. The questionnaires were given to 196 students, of which 120 questionnaires were returned, and 20 of those were incomplete. Finally, 100 questionnaires were analysed for this study.

Participants

The study inclusion criteria were all female students who participated and received a virtual physical education course at Yazd University and who were willing to participate upon completion of an informed consent form. The exclusion criteria included submitting incomplete questionnaires, refusing to cooperate, and leaving the age range. Gender was considered as a control variable in the study.

Data Collection Tools

Computer Literacy Questionnaire: To measure the level of media literacy, a standard computer literacy questionnaire was used. The questionnaire was designed based on seven computer skills and examined the components of computer literacy in the form of 59 items. This questionnaire has a five-point Likert scale: very high, high, medium, low, and very low. In this five-point Likert scale, number one indicates the lowest score, and number five indicates the highest score. The questionnaire contains five questions related to the skills of basic technology concepts, seven questions related to the skills of operating system management, nine questions related to the skill of working with Microsoft Word, ten questions related to the skills of working with the Internet, eight questions related to the skills of working with Excel, ten questions related to working with Access, and ten questions related to working with PowerPoint (2007, 2010). The minimum score from the above-mentioned statements is 59, and the maximum score is 295. The validity of this questionnaire was obtained using face validity with the opinion of experts. The computer literacy questionnaire was prepared by Son, Roob, and Charismiadji (2011) and was used in their studies. Its Content Validity Ratio (CVR) was 0.78, and its Content Validity Index (CVI) was 0.79. Using Cronbach's alpha, the reliability coefficient of the questionnaire was estimated to be 0.70 (6). The reliability of the questionnaire in the present study was confirmed by calculating Cronbach's alpha

coefficient of 0.88.

Watkins Readiness Questionnaire (Watkins): The standard e-readiness questionnaire is a 27-item which was developed by Watkins and colleagues in 2004 and measures students' e-readiness in six areas (access to technology, online communication skills, motivation, and ability to learn through the media, internet group discussions, and important issues measuring success in e-learning). Questions were scored on a 5-point Likert scale. This questionnaire had a five-point Likert scale: very high, high, medium, low, and very low. In this five-point Likert scale, number one indicates the lowest score, and number five indicates the highest score; the minimum possible score from the above statements is 27, and the maximum score is 135. The content validity has been used to determine the validity of the questionnaire. In this way, the questionnaire was provided to three technology management specialists. As a result, some items were suggested for correction, and finally, after applying the corrections, the finalized questionnaire was used. The reliability of each factor of the questionnaire is as follows: access to technology (0.95), skills and online communication (0.95), motivation (0.88), ability to learn through media (0.90), group internet conversations (0.74), and important issues for success in learning electronic (0.86). The e-readiness questionnaire was used in their studies. The reliability of the questionnaire based on Cronbach's alpha method for the whole questionnaire was 0.84 and, its Content Validity Ratio (CVR) was 0.70; the Content Validity Index (CVI) was estimated to be 0.78 by the experts (14). The reliability of the questionnaire in the present study was confirmed by calculating Cronbach's alpha coefficient of 0.91.

Sample Size

The study population consisted of all students who, at the age of 19-21 years, in the first semester of the academic year 2020-2021, received the physical education subject and, through virtual education, participated

in their classes. In this study, the sample size was 196 students who were calculated by Cochran's formula (15); 120 out of 196 students collaborated with researchers and filled out questionnaires, but the rest of the students did not cooperate due to Covid-19. In reviewing the questionnaires, 20 incomplete questionnaires were discarded, and finally, 100 questionnaires were analyzed. It should be noted that in this study, convenience sampling was used.

$$n = \frac{\dfrac{Z^2 pq}{d^2}}{1 + \dfrac{1}{N}\left(\dfrac{Z^2 pq}{d^2} - 1\right)}$$

Procedure: The questionnaire was completed through the link on the Press Line website, and the data were collected. The researchers first introduced themselves to the participants in the virtual learning environment and informed them of the purpose of the study. The participants were assured that their information would remain confidential. Their personal consent was obtained orally in the same virtual learning environment before the study began. Students were given two days to complete and send the questionnaire and the maximum time required to complete the two questionnaires was 5 minutes. The links to both questionnaires were provided to the students through social networks, and they completed and sent the questionnaires on time.

Statistical Method

Descriptive statistics and Spearman inferential statistics were used to analysis the sample. The Data were analysed using descriptive statistics and the Spearman correlation coefficient with SPSS software version 23.

Ethical Considerations

This research was conducted under the supervision of Alzahra University. The researchers introduced themselves to the participants and informed them of the purpose of the study. Students were assured that their information would remain confidential. The participants' informed personal consent was obtained before the start of the study.

Results

In this study, there were 400 undergraduate female students who took the physical education subject, out of whom 100 available selected students were to participate. The results of the descriptive statistics showed that the findings related to the age of the participants were as follows: 21-year-olds showed the highest frequency (31%), and 20-year-olds had the lowest frequency (18%). Findings related to the field of study of the participants showed that the field of humanities had the highest frequency (52 people), and the fields of basic and technical sciences had the lowest frequency (48 people), (Table 1).

In the inferential section, the normality of data distribution was first examined using the Kolmogorov-Smirnov test, which showed that the data distribution was not normal ($P \leq 0.05$).

The opinions of the participants of this study showed that virtual training classes during the prevalence of Covid-19 have been reported to have the level of literacy and e-readiness of the students.

Table 1: Frequency of participants by field and age of study

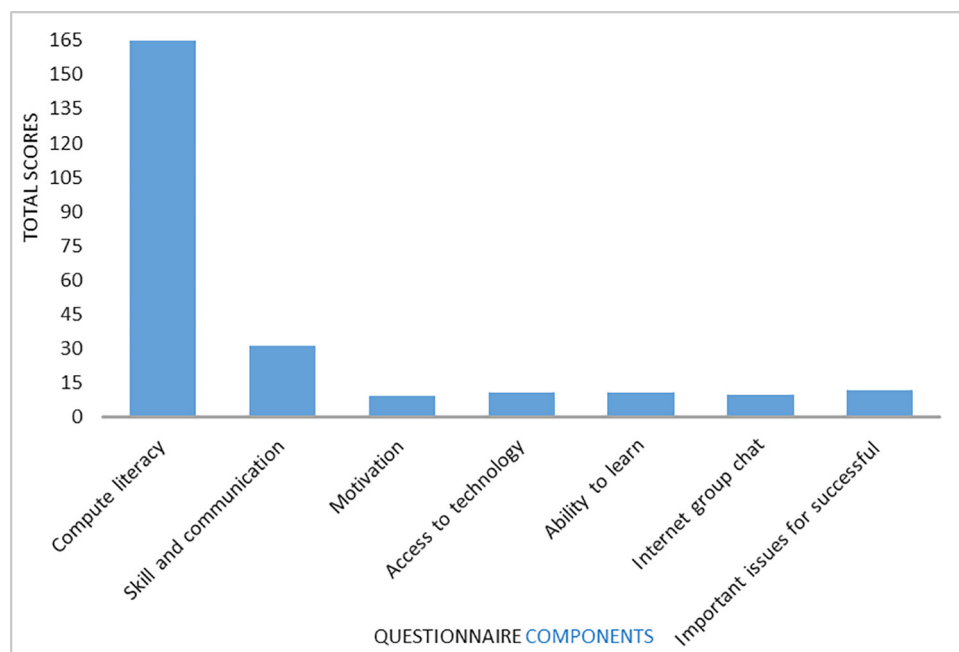| Field of study	Frequency	Percentage
Humanities	52	52%
technical	48	48%
Age		
19	25	25%
20	18	18%
21	31	31%
22	26	26%

Figure 1: Median literacy scores and e-readiness of Yazd University students

Table 2: Results of the Spearman correlation test on the relationship between computer literacy and e-readiness

Variable	Computer literacy	
E-readiness	**Correlation coefficient**	**The significance level**
Skill and communication	0.19	0.04*
Motivation	-0.004	0.96
Access to technology	0.04	0.68
Ability to learn	0.01	0.86
Internet group chat	-0.004	0.96
Important issues for successful learning	0.05	0.6

*It is significant at the level of P≤0.05

The computer literacy level of all students and the subscales of e-readiness, skills, and communication, motivation, access to technology, e-learning ability, internet group conversations, and important issues for success are shown in Figure 1. Students obtained higher scores only in the skills and communication subscales.

The results of the Spearman correlation test showed that there was a significant relationship between computer literacy and e-readiness only in the skills and communication subscale (0.04), but there was no significant relationship between computer literacy and other e- readiness subscales, motivation (0.96), access to technology (0.68), learning ability (0.86), internet group chat (0.96), and important issues for successful

learning (0.6) (Table 2).

Discussion

The Covid-19 made us realize the importance of virtual training classes as a substitute for regular classrooms, in times of calamity. The findings of this study showed that there is a significant relationship between computer literacy and e-readiness only in the subscales of skills and communication. There is no significant relationship between computer literacy and other subscales of e-readiness, motivation, access to technology, ability to learn, internet group chat, and important topics for successful learning.

In general, the level of e-readiness of the surveyed students has not been reported as optimal. These results are in line with

the results of Wallace and Clariana (10), Vahabi and colleagues (11), Ranasinghe and colleagues (12), Chung and colleagues (16), Rafique and colleagues (17), and are not in line with Audye Cidral and colleagues (13), Forrest (18), Chang and Fang (19), Shahzad and colleagues (20), Lassoued and colleagues (21), and Abbasi and colleagues (22).

In a study conducted by Wallace and Clariana (10) entitled "Perceptions versus facts: determining students' computer literacy skills and the need to teach concepts and technology," they found that students' mean scores were significantly lower than their scores. It was moderate and based on these results, it was determined that they did not have the necessary computer skills. Vahabi and colleagues (11) compared the level of information literacy of medical students at Kurdistan University with other students. It indicated that the information literacy score of medical students was higher than that of non-medical students, and in general, the students of this university were at a low level.

In addition, Ranasingh and colleagues (12) surveyed 190 first-year medical students in Sri Lanka and reported low computer literacy. Rafique and colleagues (17), surveyed 340 LIS students from nine public-sector universities in Pakistan through an online questionnaire during the COVID-19 pandemic. The findings revealed that university Pakistan LIS students were not fully personalized and successful in their decisions about their online educational activities during the Covid-19 pandemic. Chung and colleagues (16) conducted a study on 399 students in two different online learning courses in Malaysia, showing they were between slightly and moderately ready for online learning.

While Keshavarz and colleagues (6) examined the level of computer literacy of postgraduate students, the Tehran University department of management reported that the findings of these two surveys are not the same as in the current study. In a study of high school students in the UK, Forrest (18) the finding showed a good correlation among academic achievement and computer skills.

Chang and Fang (19), in a study of online higher education guidelines during coronavirus disease, analysed online learning problems and solutions and concluded that although most educators try to guide the content of the guidelines; however, there is still no easy way to monitor and change students' learning behaviors in the short term. Shahzad and colleagues (20), In a study on 100 students of Khwaja Fareed University of Engineering & Information Technology (KFUEIT), Pakistan used a questionnaire to measure students' behavior level on e-learning. The result stated that students' response to online teaching was positive. Lassoued and colleagues (21), in a study aimed at discovering barriers to achieving quality in distance education during the coronavirus epidemic, which was conducted on a large sample of professors and students at universities in the Arab world (Algeria, Egypt, Palestine and Iraq), stated that professors and students face their own barriers as well as educational, technical, financial, or organizational barriers. Audye Cidral and colleagues (13), in a study of 301 university students in Brazil, stated that if the e-learning system is easy in terms of content and features and has a good structure, it will increase the satisfaction and use of e-learning systems. On the other hand, in a study conducted by Abbasi and colleagues (22) on 382 responses (137 M, 245 F), who were received students' perceptions of e-learning during the coronavirus epidemic in a private medical college, found that most students had a negative perception of e-learning.

The present study aimed to investigate the level of computer literacy with subscales of students' e-learning in the Covid-19 epidemic, and the findings of this study showed that the level of computer literacy of students is not at the desired level, and between computer literacy and e-readiness is only relevant in skill subscales. The outbreak of the coronavirus has caused many changes in people's lives, with an unknown future leading to extreme stress among the university community, including students (23). There is an opportunity for

professors, principals, directors, and people who study at universities to learn how to prevail in this serious situation. As a result of this crisis, online learning can give them more opportunities (24). Universities can design computer literacy courses, develop educational topics, and provide practical training in computer literacy and increase the quality of computer systems to improve students' skills (25).

Finally, from the findings of the present study, it can be concluded that universities have faced unprecedented challenges due to the outbreak of coronavirus. Many universities are working to overcome this crisis by maintaining consistent delivery of courses, ensuring strong student enrolment, and providing clear communication with staff and students. To do this, higher education institutions need to listen to the needs and concerns of students and upgrade themselves with the latest technological tools.

Hence, despite all the limitations, which include the following: inadequate connection, poor internet, pressure and stress on the eyes, limited interaction with students. Some suggestions for this research include:

University planners need to pay special attention to improving students' computer literacy skills, holding practical courses related to improving computer literacy skills in the university, conducting research related to the assessment of students' computer literacy, participation of students in the university in information technology training courses.

Ethical Considerations

This research was conducted under the supervision of Alzahra University. The researchers introduced themselves to the participants and informed them of the purpose of the study. Students were assured that their information will remain confidential. The participants' informed personal consent was obtained before the start of the study.

Authors' Contributions

SSKH & RRE: proposed the research idea and wrote the paper.

SF & RRE & PKHM: collected the research resources and monitored the writing process.

RRE & PKHM: revised the paper.

SSKH & RRE: responded to the reviewers.

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