Int. j. adv. multidisc. res. stud. 2023; 3(1):200-209

Received: 17-11-2022
Accepted: 27-12-2022

International Journal of Advanced Multidisciplinary Research and Studies

ISSN: 2583-049X

Readiness of Students for E-Learning During the Covid-19 Pandemic: A Case Study

Diyabedanage Nilmini
University of Vocational Technology, Ratmalana, Sri Lanka

Corresponding Author: **Diyabedanage Nilmini**

Abstract
In response to the COVID-19 pandemic, universities have shifted from face-to-face learning environments to e-learning. However, lecturers are concerned about students' readiness for e-learning as a result of the abrupt shift to online teaching. This study looks into students' readiness for e-learning during the COVID-19 pandemic, specifically whether there are any significant differences between students' demographic factors, self-directed learning, technology availability with infrastructure facility, computer with Internet efficacy, and socioeconomic factors. The study employed a convincing sampling; structured questionnaire distributed among 480 undergraduates and received 202 respondents. SPSS 23 software used to determine reliability, analyzed the impact on readiness for e-learning. Findings identified that most students are ready for an e-learning mode of instruction. Further analysis indicated that there were differences in students' readiness for e-learning based on their demographic profiles, self-directed learning, technology availability with infrastructure facility, computer with Internet efficacy. In this study revealed that students' readiness for e-learning depended with some demographic factors, infrastructure facility, skills and knowledge of adaptation to online learning environment.

Keywords: COVID-19 Pandemic, E-learning, Readiness, University

1. Introduction

The use of technology to enhance teaching and learning processes is known as e-learning (Doculan, 2016) [15]. E-learning's objectives are to make education more accessible, affordable, and productive. e-learning, according to Waryanto (2014) [49], is the electronic delivery of educational materials or educational experiences through a multimedia computer. According to Wang *et al*., (2007) [50], the e-learning system is a unique kind of instructional system, furthermore, So and Shraim. and Zuheir (2010) [42] defined it as education involving the use of electronic devices like computers and the internet. Shorter learning periods, lower costs, simpler interaction between students and the materials, and accessibility at any time are all advantages of using e-learning.

Both at the national and international levels, as well as internationally, the Covid-19 pandemic crisis had an unanticipated direct impact on education (Agnoletto & Queiro, 2020; Akaslan & Law, 2011) [4, 5]. Even in terms of the curriculum, educator roles, student positions, and assessments, COVID-19 has changed the educational system (Daniel, 2020) [13]. Additionally, Covid-19 has altered how future generations are educated, even redefining what an educator is supposed to do (Luthra & Mackenzie 2020) [20]. In principle, Widodo *et al*., (2020) [51] state that the following factors can be used to gauge a student's readiness for e-learning: equipment capability, technology skills, self-directed learning, motivation, and perceived usefulness. Additionally, Covid-19 expands on the role of technology in supporting education and emphasizes the value of life skills for the future. Digital technology and learning innovation are thus two crucial concepts when addressing education in the context of the Covid-19 pandemic. Many nations have made efforts to lessen Covid-19's negative effects on education, particularly learning. The most popular method for learning mitigation is distance learning, especially e-learning. How to evaluate a student's readiness for e-learning is one of the fundamental problems.

As a strategy for dealing with the COVID 19 pandemic and without delaying the program activities for the students, the University of Vocational Technology (UoVT) of Sri Lanka has also gotten involved in conducting academic activities via online platforms. Within the Sri Lankan context, particularly within educational institutions like University of Vocational Technology, this has not been an easy task. Since continuing academic and administrative activities online is now both a policy choice and the only realistic option, special consideration must be given over the coming years to challenges, difficulties, lessons learned, etc. in order to comprehend how this new norm is operating within the UoVT environment and system.

Though the Academic Staff is prepared and equipped with the necessary skills, competencies, and knowledge to carry out teaching via online mode, whether the students are prepared and armed with the necessary skills to learn via online mode is a question that needs to be answered. This is especially true for vocational study programs, which require hands-on experiences to teach to learn, and there is a general perception that vocational study students are poor in knowledge, have financial difficulties, lack infrastructure facilities, and so on. As a result, the goal of this research is to assess the level of preparedness of University of Vocational Technology students and recommend appropriate actions to close any gaps or deficiencies.

1.1 Aims and objectives

1.1.1 Aim

Determine the readiness of students for e-learning during the COVID-19 period

1.1.2 Specific Objectives

- Analyze students' demographic variables
- Analyze technology availability with infrastructure facility
- Analyze the related electronic devices with Internet efficacy
- Analyze socioeconomic factors

2. Role and function of theory in online education development

The need for the education system to transform itself for the future is being pushed by a variety of forces, and this will fundamentally alter the role of the teacher. The Fourth Industrial Revolution (World Economic Forum, 2017) [52], innovative pedagogies (Suarez *et al.,* 2018) [45], information explosion brought on by increased internet use (Reyna *et al.* 2018) [40], The Fourth Industrial Revolution, according to the World Economic Forum (2017) [52], is altering the world because new technologies that combine the physical, digital, and biological worlds are having an effect on all fields of study, as well as economies and industries. By the year 2030, education must equip teachers to teach students how to function successfully in the Fourth Industrial Revolution in order to deal with these pervasive changes. Future digital teachers may receive training through formal teacher preparation programs or through lifelong learning-based professional development (Chai & Kong, 2017) [11]. To ensure that teachers are prepared for the future, nations all over the world are investing in teacher professional development (Kong *et al.,* 2017) [27]. In the digital age, professional development will be more crucial than ever for educators to stay current with effective, adaptable teaching methods for more advanced students (Inverso, *et al.,* 2017; Patterson, 2018) [24, 36].

2.1 Learner Preparation for online

To get students connected and motivated to learn the online lesson, as well as to get them ready for the specifics of the lesson, a variety of pre-learning activities can be used. To convince students of the value of participating in the online lesson and to demonstrate how it will help them, a justification should be given. The online lesson's specifics are incorporated into the preexisting cognitive structure, and a concept map is provided to help learners learn the lesson's specifics by activating their preexisting cognitive structures. The concept map for the lesson also shows the "big picture" to the students. The lesson's learning objectives should be made clear to the learners so they will know what is required of them and be able to determine when they have met the objectives. An advance organizer should be offered to create a framework for grouping the information in the online lesson or to connect what students already know with what they still need to learn. The prerequisite requirements must be explained to students so they can determine whether they are prepared for the lesson. Giving students the prerequisites also activate the brain regions that are needed for learning the material. To enable students to determine whether they already possess the knowledge and skills covered in the online lesson, a self-assessment should be made available at the beginning of the lesson. If students feel they possess the necessary knowledge and skills, the self-assessment aids students in organizing the lesson materials and identifying the key components of the lesson. Once students are ready to learn the specifics of the lesson, they can proceed to complete the e-learning activities to do so.

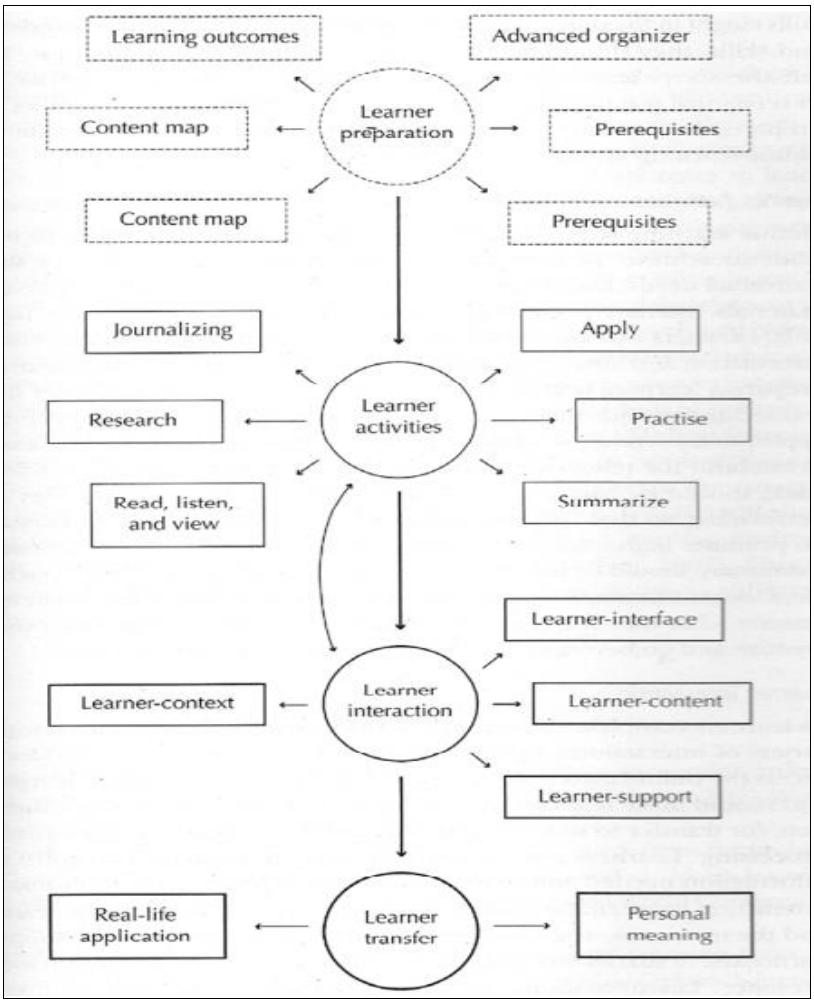
2.2 Learner Activities for online

To meet the learning objectives of the lesson and to meet the needs of each individual learner, online learners should be given access to a variety of learning activities. Reading text-based materials, listening to audio materials, and watching visual or video materials are a few examples of learning activities. To find out more, students can do research online and connect to libraries and other online resources. Making a learning journal will enable students to reflect on what they have learned and give the material a personal interpretation. To prove the relevance of the materials, appropriate application exercises should be incorporated throughout the online lesson. It is important to include practice activities with feedback so that students can keep track of how they are doing and, if necessary, modify their learning strategy. To encourage higher-level processing and to wrap up the lesson, a summary should be given, or students should be required to create one.

Live e-learning is the practice of teaching and learning through real-time, live online broadcasting (Abdous, 2010; Zhao *et al*., 2018) [1, 54]. Teachers are required to upload the lesson plans in advance to the learning platform, deliver lectures and tutorials in real-time, respond to students' questions, and allow discussion during class. Despite the fact that motivation and engagement are crucial for e-learning, the stories are different now because of the coronavirus pandemic outbreak. Every stakeholder, including teachers and students, must engage in online teaching and learning. No matter their teaching methods, level of participation, or technological limitations, teachers must adapt. Universities have designated online teaching tools, infrastructure, and technical support from the information technology (IT) department to support the teaching in real-time in order to implement e-learning. The readiness of students for a live online learning environment is still unknown because they can attend the live lessons from anywhere, making it impossible for teachers to monitor or control.

This investigation into students' readiness for e-learning during the COVID-19 pandemic sought to identify any notable differences between students' gender, age, ethnicity, educational attainment, and field of study and their level of preparedness for an online learning environment. According

to Randall *et al*., (2020) [37], a study of students' readiness could provide crucial information about how they would adjust to the abrupt switch to a full implementation of e-learning without face-to-face classes.



Source: Anderson, T. 2008, P(37)

Fig 1: Components of effective online learning

2.3 Learner Interaction for online

Numerous published taxonomies (Bonk *et al*., 2018; Song and McNary 2011; Hussin *et al*., 2019; Bonk and Reynolds, 1997; Hirumi, 2006) [9, 43, 18, 10, 23] provide educators with knowledge of the types of interactions that may take place in e-learning. Hirumi (2006) [23] discusses four dimensions of published e-learning interaction taxonomies.

As per figure 2 indicated that the cognitive operations that make up learning and the metacognitive processes that aid people in monitoring and controlling learning make up learner self-interactions (Level I), which take place in learners' minds. The learner interacts with other human or non-human resources at Level II. Interactions between the learner and the instructor (Level III) are regarded as a meta-level that transcends and is used to direct the planning and sequencing of Level II interactions.

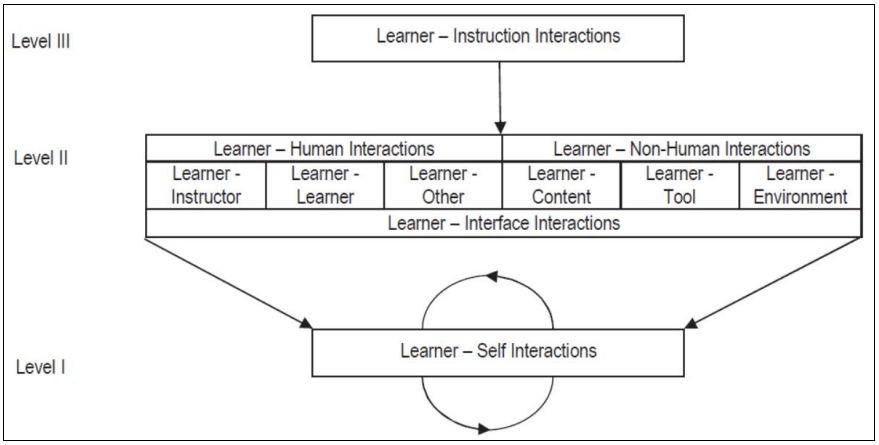


Fig 2: Three levels of planned e-learning interactions Source: Hirumi's (2006) [23]

Learners will engage in a variety of interactions as they complete the learning activities. To access the online materials, students must interact with the interface. The interface should not overwhelm users and should make it as simple as possible for users to perceive information, transfer it to a sensory memory, and then process it in their short-term memory. In order to obtain the knowledge required to create the knowledge base, learners must engage with the content. In order to cooperate, take part in shared cognition, form social networks, and establish social presence, there needs to be interaction between the learner and other learners, the learner and the teaching style, and the learner and experts. In order to personalize information and create their own meaning, learners should be able to interact within their context.

2.4 Students' readiness for e-learning

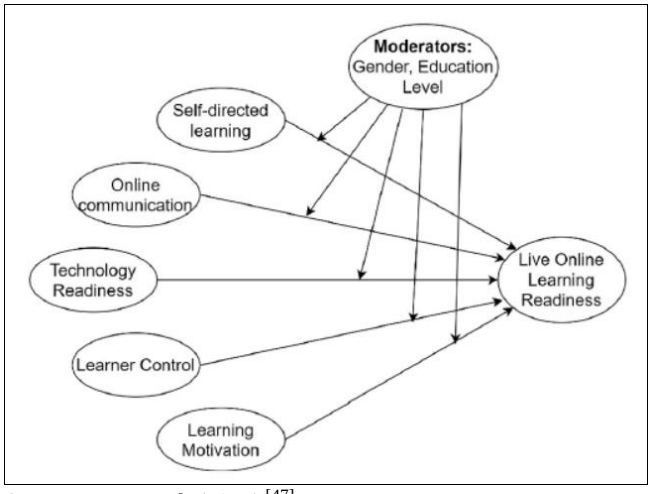
How prepared the students are a crucial factor in implementing e-learning successfully (Rasouli *et al*., 2016) [38]. Concerns about whether students can control their own learning have been raised by prior studies (Adams *et al.*, 2018) [2]. For some students, especially those who were originally from rural or remote areas, the work that was previously done by the lecturers or teachers in the classroom may now be transferred online. Many students were still more at ease with traditional learning despite the increased use of technology because they had spent more time in primary and secondary school immersed in this method of instruction (Adams and Dewitt, 2021) [3]. According to Howard (2009) [17], e-learning students missed out on face-to-face interaction with their instructors and fellow students. Students were neither satisfied nor prepared for this abrupt shift toward online education, according to Kundu and Bej's (2021) [29] research. Students view this temporary shift to e-learning as a pandemic response. These findings show that even though many students supported technology, they were not willing to give up face-to-face instruction. According to Lopez-Perez *et al.*, (2011) [30], tertiary students appeared to favor e-learning as a supplement to conventional classroom teaching methods.

Little information on students' readiness has been found in reviews of earlier studies on e-learning. Evaluation of student readiness should receive the necessary attention in order to ensure the successful implementation of any e-learning model of instruction (Drysdale *et al.*, 2013) [16]. The impact of various factors on students' e-learning experiences has been thoroughly investigated (Mohamed Fauzi and Raja Hussain, 2016) [31]. Other elements consist of students' knowledge (George *et al*., 2014) [21], technology proficiency (Rasouli *et al.*, 2016) [38], technology accessibility (Rasouli *et al.*, 2016) [38], self-directed learning (Kaur, 2014) [25], and computer and Internet effectiveness (Kumar, 2017) [28]. Self-directed learning, learner control, motivation for learning, computer/Internet self-efficacy, and online communication self-efficacy were the five factors examined in a recent study by Chung *et al.*, (2021) [12] at a Malaysian public university.

As is clear from the literature, prior studies were primarily focused on e-learning in general even though the significance of examining student readiness is primarily acknowledged. Research on how prepared students are for e-learning is still lacking. According to Park (2009), for higher education institutions to successfully adopt the e-learning environment, they must evaluate their students' readiness for e-learning. Harris *et al.*, (2009) [22] emphasized the significance of student perspectives and further emphasized their importance. According to a review of the literature, there are five main components that affect students' readiness for e-learning: (1) technology skills, (2) technology usage, (3) technology availability, (4) self-directed learning, and (5) computer and Internet efficacy.

2.5 Learner Control

The phrase "the learners will benefit if given more control over the pace or style of instruction they receive" refers to learner control (Tabbers *et al.*, 2010) [46]. Learner control refers to giving each individual learner the freedom to make decisions about the learning materials they use, how the tasks are organized, how much practice they get, and how many learning sessions they receive based on their unique cognitive requirements (Tang *et al.*, 2019). The importance of learner control has been discussed by a number of researchers (e.g., Tang *et al.*, 2009; Orvis *et al.*, 2010).



Source: Tang et al.,(2021) [47]

Fig 3: Five key factors contributing to a student's readiness for the live online learning environment

Educators have realized that dynamic participation and learner control are essential for effective learning (Oxford, 1990) [34]. As a result, students are able to adapt different learning materials in a constantly changing environment by understanding learning approaches (Tang *et al.*, 2019). In order for the students to respond more favorably to the e-learning program and for such positive learning attitudes to improve engagement in the learning task itself, the design and implementation of e-learning must be in line with their preferences (Orvis *et al.*, 2010).

2.6 Technology readiness

Technology readiness was defined as "peoples' propensity to embrace and use new technologies for accomplishing goals in home life and at work" by Parasuraman in 2000. Technology integration is a challenging process that requires readiness (Blut & Wang, 2020) [8]. It has been noted as a crucial component in boosting behavioral intention toward high-tech services or goods. It is necessary to investigate how students' behavioral intentions toward e-learning are affected by their technological readiness (Badia *et al.*, 2014) [7]. Indeed, innovation and optimism are crucial for technology readiness, whereas unease and discomfort typically make users less ready for technology (Summak *et*

al., 2010 [44]; Kim *et al.*, 2020). According to a study by Hawkins and Mothersbaugh (2010), consumer behavior and technology readiness are related. To this end, in order to effectively examine technology readiness and understand students' propensity to adopt new technologies, we must take into account both internal (such as personality and learning) and external (such as social status and culture) factors (Shirahada *et al.*, 2019) [41].

3. Methodology

3.1 Instrumentation

In this study, a stratified sampling method was used to determine the level of student readiness for e-learning; a questionnaire was created and circulated. The questionnaire included 40 items in four dimensions that addressed various aspects of students' readiness for e-learning in addition to four basic demographic questions about gender, age, district, and field of study. The five dimensions are as follows, along with the number of questions for each dimension: Self-directed learning (five items), technology availability & infrastructure facility (four items), computer and Internet efficacy (nineteen items), and socioeconomic factors are all listed as technology skills and usage. All of the items had a five-point Likert-type scale with the options being strongly disagree (1) to strongly agree (5).

Table 1: Identified dimensions and indicators of student readiness for e-learning

Dimension	Indicator
Technological skills and usage (Ten items)	1. Familiar with keyboard and mouse 2. Managing files effectively 3. Software installation capability 4. Usage of relevant software applications 5. Knowledge on copying and pasting 6. Uploading and downloading capability 7. Internet skills (connecting, accessing sites using browsers) 8. Ability to use online communication tools 9. Perform online research actively 10. Create online accounts efficiently
Technology availability & infrastructure facility (Four items),	1. Smart phone 2. Network connection 3. Signal strength 4. Power connection
Self-directed learning (Five items)	1. Self-motivation 2. Create SMART goals 3. Understand your learning style 4. Self-standards, monitor and evaluate 5. Practice persistence
computer and Internet efficacy (Nineteen items)	1. Navigate online course materials efficiently. 2. Communicate effectively with my instructor via e-mail. 3. Communicate effectively with technical support via e-mail, telephone, or live online chat 4. Submit assignments to an online drop box 5. Overcome technical difficulties on my own. 6. Navigate the online grade book. 7. Manage time effectively 8. Complete all assignments on time. 9. Learn to use a new type of technology efficiently 10. Learn without being in the same room as the instructor. 11. Learn without being in the same room as other students. 12. Search the online course materials 13. Search the Internet to find the answer to a course-related question 14. Communicate using asynchronous technologies 15. Meet deadlines with very few reminders. 16. Complete a group project entirely online. 17. Use synchronous technology to communicate with others 18. Focus on university work when faced with distractions 19. Develop and follow a plan for completing all required work on time
Socio-economic factors (Two items)	1. Financial status 2. expenditure

Table 2: Sample selection

Group	FICT	FET	FIT	FE
B2Y3	20	20	20	20
B2Y2	20	20	20	20
B2Y1	20	20	20	20
B1Y3	20	20	20	20
B1Y2	20	20	20	20
B1Y1	20	20	20	20
Total	120	120	120	120

3.2 Sample selection

The sample design was used considering four faculties such as weekend (B2)/Weekday(B1) groups and three academic years as mentioned above the table 2.

Abbreviation:
FCT: Faculty of Information and Communication Technology
FET: Faculty of Engineering Technology
FIT: Faculty of Industrial Technology
FE: Faculty of Education
B1: Batch one (Weekday batch) B2: Batch Two (Weekend batch)
Y1: Academic Year one Y2: Academic Year two Y3: Academic Year three.
A total of 480 students were selected representing the four faculties, both batches and academic year of the University of Vocational Technology from May 2020 to November 2020 period. Convenience sampling technique was used, where respondents were administered an online survey.

4. Results and discussion

4.1 Demographic analysis of the sample population

202 students were responded out of the 480-sample population and summary of the demographic profile indicated in the Table 1.

Table 1: Frequency distribution of demographic profile of respondents (N=202)

Demographics factor		Respond	Percentage (%)
Gender	Male	49	23.9
	Female	453	74.6
Age	Less than 20 years	106	51.7
	21-30 years	60	29.3
	31-40years	24	11.7
	41-50 years	12	5.9
District	Ampara	8	3.9
	Anuradhapura	11	5.4
	Badulla	20	9.8
	Baticclo	4	2
	Colombo	5	2.4
	Gampaha	9	4.4
	Galle	9	4.4
	Hambantota	9	3.9
	Jaffna	4	2.0
	Kalutara	6	2.9
	Kandy	13	6.3
	Kegalle	16	7.8
	Kurunegala	32	15.6
	Matale	2	1.0
	Matara	17	6.3
	Monaragala	3	1.5
	Mulative	1	0.5
	Nuwaraeliya	2	1.0
	Puttalum	10	4.9
	Rathnapura	12	5.9
	Trinco	3	1.5
	Vavniya	5	2.4
Faculty	FICT	39	19.0
	FET	35	17.1
	FIT	87	42.4
	FE	41	20.0
Batch and academic year	B1Y1	60	29.3
	B1Y2	31	15.1
	B1Y3	25	12.2
	B2Y1	44	21.5
	B2Y2	31	15.1
	B2Y3	11	5.4

As per the Table 1 around 75% were represented female students and more than 50% of the respondents were belong to less than 20 years of age. Highest number of the sample was represented from Kurunegala district as 15.6%. Around 42% of the respondents were represented by the Faculty of Industrial Technology and 29% belong to first year of the batch 1 for this study.

4.1.1 Impact of data availability and signal strength on location of the study

Table 2a: Relationship with data availability and signal strength on location of the study

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	362.729	2	181.364	6.535	0.002[b]
Residual	5522.742	199	27.752		
Total	5885.470	201			

a. Dependent Variable: Location(District)
b. Predictors: (Constant), data availability and signal strength

Table 2b: Coefficient values of data availability and signal strength for location of the study

Model	Unstandardized coefficient		Standardized coefficient	t	Sig.
	B	Std Error	Beta		
constant	362.729	1.104		9.530	0.000
Signal strength	-1.209	0.435	-0.230	-2.778	0.006
Data availability	1.488	0.429	0.287	3.468	0.001

a. Dependent Variable: Location(District)

Table 2a and 2b show that the location of study is highly influenced by the data availability and signal strength.

4.2 Socio economic factors

Considering the employability of the parent of the respondents, as shown in the Table 3, 43.4% were reported employability of their fathers, which was the highest value. Private sector employments were observed in highest percentage as 48.8%. Around 15% of the respondent's families were observed to entitle for facilitating with Samurdhi. The highest average monthly income of the respondent's families were detected the range of SLR 20,0001 – 30,000, which was about 34%. The average monthly expenses of the families, that their expenses were higher than the income, which was observed around 66%.

Table 3: Frequency distribution of socio-economic factors of the respondents

Measuring indicator		Respond	Percentage (%)
Parent employability	Both are employed	37	18.0
	Father employed	89	43.4
	Mother employed	28	13.7
	Both are unemployed	47	22.9
Nature of the employability	Government	21	10.2
	Semi-government	36	17.6
	Private sector	100	48.8
	Casual work	45	22.0
Samurdhi facility	Yes	30	14.6
	No	172	83.9
Family income per month (SLR)	Less than 10,000	30	14.6
	10,0001 – 20,000	65	31.7
	20,0001 – 30,000	70	34.1
	31,0001 – 40,000	37	18.0
Monthly expenses (SLR)	Over expenses than income	135	65.9
	Expenses equal with monthly income	50	24.4
	Less expenses than monthly income	17	8.3

4.3 Technology availability & infrastructure facility

Based on the Table 4, most of the respondents were used smartphone for their day-to-day activities, which is 87.1%, whereas, the laptop availability was detected 55%.

Table 4: Frequency distribution of technology availability & infrastructure facility of the respondents

Facility factor		Respond	Percentage (%)
Laptop availability	Yes	89	43.4
	No	113	55.1
Smartphone facility	Yes	179	87.3
	No	23	11.2
Data availability	Very good	93	44.9
	Good	74	36.1
	Fair	21	10.2
	Bad	5	2.4
	Problem	10	4.9
Signal strength	Excellent	9	3.9
	Good	80	39.0
	Fair	64	31.2
	Poor	32	15.6
	Dead zone	18	8.8

Highest percentage of respondents were indicated that the data availability level was very good (44.9%), but 8.8% of the population was stayed in dead zone considering the signal strength.

4.4 Reliability of the indicated items

Table 5 shows the Combach's Alpha values of this study is more than 0.7 for three variables. Alpha value of the computer and Internet efficacy, Self-directed learning, and Technological are 0.915, 0.836 and 0.799 respectively. The results of the variables in this study are highly correlated. Therefore, the questionnaire is in an acceptable level. The Technology availability & infrastructure facility is moderately correlated.

Table 5: Cronbach's Alpha Values of Variables

Variable	Cronbach's Alpha Values of Variables	No of items
Technology availability & infrastructure facility	0.618	04
Technological skills and usage	0.799	10
Self-directed learning	0.836	05
computer and Internet efficacy	0.915	19

4.5 Technological skills and usage, Self-directed learning, and computer and Internet efficacy

As shown in table 6, Pearson's correlation is 0.690 is 0.01 at the confidence level (0.0000.01), indicating that there is a strong positive relationship between the two variables and that they are correlated. As a result, some of the factors can have an impact on self-directed learning and technological skills and their application. The computer and internet efficacy and technological skills were found to have a weak positive relationship (0.242 at confidence level 0.0000.01). Pearson's correlation between computer and Internet efficacy and self-directed learning is 0.062 at the 95% confidence level (0.000<0.384).

Table 6: Relationship between Technological skills and usage, Self-directed learning, and computer and Internet efficacy

		Technological skills and usage	Self-directed learning	computer and Internet efficacy
Technological skills and usage	Pearson Correlation Sig. (2-tailed) Sum of Squares and Cross-products Covariance N	1 3015.609 15.003 202	0.690** 0.000 1044.396 5.196 202	0.242** 0.001 1138.614 5.665 202
Self-directed learning	Pearson Correlation Sig. (2-tailed) Sum of Squares and Cross-products Covariance N	0.690** 0.000 1044.396 5.196 202	1 760.733 3.785 202	0.062 0.384 -145.733 0.725 202
computer and Internet efficacy	Pearson Correlation Sig. (2-tailed) Sum of Squares and Cross-products Covariance N	0.242** 0.001 1138.614 5.665 202	0.062 0.384 -145.733 0.725 202	1 7368.733 36.660 202

**. Correlation is significant at the 0.01 level (2-tailed).

4.6 Technological skills and usage, Self-directed learning, computer and Internet efficacy of Students' Readiness for e-learning

Table 7: Relationship between Students' readiness with Technological skills and usage, Self-directed learning, and computer and Internet efficacy

		Technological skills and usage	Self-directed learning	computer and Internet efficacy
Readiness	Pearson Correlation Sig. (2-tailed) Sum of Squares and Cross-products Covariance N	-0.178* 0.011 -107.040 -0.533 202	-0.276** 0.000 -83.050 -0.413 202	-0.225** 0.001 -210.950 -1.050 202

*Correlation is significant at the 0.01 level (2-tailed)
**. Correlation is significant at the 0.05 level (2-tailed)

As shown in table 7, there is an inverse relationship between readiness and technological skills, self-directed learning, and computer and internet skills, with Pearson values of -0.178, -0.276, and -0.225, respectively. Based on these findings, students' readiness for e-learning is influenced by technological skills, self-directed learning, and computer and internet efficacy.

4.7 Regression Analysis

Table 8a: Impact of self-directed learning on readiness for e-learning

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.276[a]	.076	.071	.742	.076	16.452	1	200	.000

Table 8b: Impact of Technological skills on readiness for e-learning

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.178[a]	.032	.027	.760	.032	6.680	1	200	.011

Table 8c: Impact of Computer and internet efficacy on readiness for e-learning

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.225[a]	.051	.046	.752	0.051	10.665	1	200	.001

The Table 8a, 8b and 8c, indicate that the self-directed learning behaviour accounted for 7.6% of the students' readiness for e-learning, whereas the technological skills and computer & internet efficacy are accounted 3.2% and 5.1% respectively. All these three criteria were not directly supported to the readiness for e-learning.

4.8 ANOVA results in self-directed learning, Technological skills, and Computer & internet efficacy on readiness for e-learning

As per the Table 9a, 9b and 9c shows that three criterion, such as self-directed learning, Technological skills, and Computer & internet efficacy significantly influenced to the students' readiness for e-learning. Self-directed learning is highly influenced (F=16452, α=0.000) than the other two criterion to the readiness for e-learning.

Table 9a: Impact of self-directed learning on readiness for e-learning

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	9.067	1	9.067	16.452	0.000[b]
Residual	110.221	200	0.551		
Total	119.287	201			

a. Dependent Variable: Readiness
b. Predictors: (Constant), Self-directed learning

Table 9b: Impact of Technological skills on readiness for e-learning

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	3.799	1	3.799	6.580	0.011[b]
Residual	115.488	200	0.577		
Total	119.287	201			

a. Dependent Variable: Readiness
b. Predictors: (Constant), Technological skills

Table 9c: Impact of Computer and internet efficacy on readiness for e-learning

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	6.039	1	6.039	10.665	0.001[b]
Residual	113.248	200	0.566		
Total	119.287	201			

a. Dependent Variable: Readiness
b. Predictors: (Constant), Computer and internet efficacy

5. Conclusion and recommendation

In this study revealed that data availability and adequate signal strength were received around 45% of the sample population whereas around 9.0% of the student population was stayed in the area of dead zone without any facilities. Around 15% of the families was belonging to low financial income, therefore it would be affected to pay online connections. Based on these findings, students' readiness for e-learning is influenced by technological skills, self-directed learning, and computer and internet efficacy, and fact that these three criteria were not directly supported to the readiness for e-learning.Self-directed learning is highly influenced (F=16452, α=0.000) than the other two criterion to the readiness for e-learning.

6. References

1. Abdous MH, Yen CJ. A predictive study of learner satisfaction and outcomes in face-to face, satellite broadcast, and live video-streaming learning environments. The Internet and Higher Education. 2010; 13(4):248-257.
2. Adams D, Sumintono B, Mohamed A, Mohamad Noor NS. E-learning readiness among students of diverse backgrounds in a leading Malaysian higher education institution, Malaysian Journal of Learning and Instruction. 2018; 15(2):227-256.
3. Adams D, Dewitt D. Innovative practices of technology-enhanced learning, Universiti Pendidikan Sultan Idris, 2021.
4. Agnoletto R, Queiroz VC. COVID-19 and the Challenges in Education CEST. 2020; 5(2).
5. Akaslan D, Law ELC. Measuring Student e-learning Readiness: A Case About the Subject of Electricity in Higher Education Institutions in Turkey. In H. Leung, E. Popescu, Y. Cao, R W H Lau, W Nejdl (Eds), Advances in Web-based Learning, Proceedings of ICWL. LNCS 7048. Berlin, Heidelberg, New York, Springer, 2011, 209-218.
6. Anderson T. The theory and practice of e-learning. Athabasca University Press, 2008.
7. Badia A, Garcia C, Meneses J. Factors influencing university instructors' adoption of the conception of online teaching as a medium to promote learners' collaboration in virtual learning environments. Procedia - Social and Behavioral Sciences. 2014; 141:369-374. Doi: https://doi.org/10.1016/j.sbspro.2014:05.065
8. Blut M, Wang C. Technology readiness: A meta-analysis of conceptualizations of the construct and its impact on technology usage. Journal of the Academy of Marketing Science. 2020; 48:649-669. Doi: https://doi.org/10.1007/s11747-019-00680-8
9. Bonk CJ, Kirkley J, Hara N, Dennen VP. Finding the instructor in post-secondary online learning: Pedagogical, social, managerial and technological locations. In Teaching & Learning Online, Routledge, 2018, 76-97.
10. Bonk CJ, Reynolds TH. Learner-centered web instruction for higher-order thinking, teamwork, and apprenticeship. In B.H. Khan (Ed.), Web-based instruction, Englewood Cliffs, NJ: Educational Technology Publications, 1997, 167-178.
11. Chai CS, Kong SC. Professional learning for 21st century education. Journal of Computers in Education. 2017; 4(1):1-4.
12. Chung E, Subramaniam G, Dass LC. Online learning readiness among university students in Malaysia amidst COVID-19, Asian Journal of University Education. 2021; 16 (2):46-58.
13. Daniel SJ. Education and the COVID 19 Pandemi Prospects, 2020. Doi: https://doi.org/10.1007/s11125-020-09464-3
14. Dönmez O, Simsek Ö, Arikan YD. How can we make use of learner interaction in online learning environments? Procedia-Social and Behavioral Sciences. 2010; 9:783-787.
15. Doculan JAD. E-Learning readiness assessment tool for Philippine higher education institutions. International Journal on Integrating Technology in Education (IJITE). 2016; 5(2):33-43.
16. Drysdale JS, Graham CR, Spring KJ, Halverson LR. An analysis of research trends in dissertations and theses studying blended learning, The Internet and Higher Education. 2013; 17:90-100. Doi: 10.1016/j.iheduc.2012.11.003
17. Howard SB. The benefits of face-to-face interaction in the online freshman composition course, Journal of Online Learning and Teaching. 2009; 5(4):685-697.
18. Hussin WNTW, Harun J, Shukor NA. A Review on the Classification of Students' Interaction in Online Social Collaborative Problem-based Learning Environment: How can we enhance the students' online interaction. Universal Journal of Educational Research. 2019; 7(9A):125-134.
19. Hussin H, Bunyarit FS, Hussein R. Instructional design and e-learning: examining learners' perspective in Malaysian institutions of higher learning, Campus-Wide Information System. 2009; 26(1):4-19.
20. Luthra P, Mackenzie S. 4 Ways Covid-19 Education Future Generations, 2020. https://www.weforum.org/agenda/2020/03/4-ways-covid-19-education-futuregenerations/
21. George PP, Papachristou N, Belisario JM, Wang W, Wark PA, Cotic, Z, *et al*. Online eLearning for undergraduates in health professions: A systematic review of the impact on knowledge, skills, attitudes and satisfaction, Journal of Global Health. 2014; 4(1):1-17.
22. Harris P, Connolly J, Feeney L. Blended learning: Overview and recommendations for successful implementation, Industrial and Commercial Training. 2009;41(3):155-163. Doi: 10.1108/00197850910950961
23. Hirumi A. Analyzing and designing e-learning interactions. In Charles Juwah (Ed.), Interactions in online education implications for theory & practice, New York: Routledge Publishing, 2006, 46-71.
24. Inverso DC, Kobrin J, Hashmi S. Leveraging technology in adult education. COABE Journal. 2017; 6(2):p55.
25. Kaur N. Teacher-led initiatives in supporting learner

empowerment among Malay tertiary learners, Malaysian Journal of Learning and Instructions. 2014; 11:101-126. Doi: 10.32890/ mjli2014.11.0.7667
26. Kim MJ, Lee CK, Preis, MW. The impact of innovation and gratification on authentic experience, subjective well-being, and behavioral intention in tourism virtual reality: The moderating role of technology readiness. Telematics and Informatic, 2005.
27. Kong SC, Looi CK, Chan TW, Huang R. Teacher development in Singapore, Hong Kong, Taiwan, and Beijing for e-Learning in school education. Journal of Computers in Education. 2017; 4(1):5-25.
28. Kumar A. E-learning and blended learning in orthodontic education, APOS Trends in Orthodontics. 2017; 7(4):188-198.
29. Kundu A, Bej T. COVID-19 response: Students' readiness for shifting classes online, Corporate Governance, 2021. Doi: 10.1108/CG-09-2020-0377
30. Lopez-Perez MV, Perez-Lopez MC, Rodriguez-Ariza L. Blended learning in higher education: Students' perceptions and their relation to outcomes, Computers and Education. 2011;56(3):818-826. Doi: 10.1016/j.compedu.2010.10.023
31. Mohamed Fauzi SS, Raja Hussain RM. Designing instruction for active and reflective learners in the flipped classroom, Malaysian Journal of Learning and Instruction. 2016; 13(2):47-173. Doi: 10.32890/mjli2016.13.2.7717.
32. Mohamad SNM, Salleh MAA, Salam S. Factors affecting lecturers' motivation in using online teaching tools. Procedia - Social and Behavioral Sciences. 2015; 195:1778-1784.
33. Orvis KA, Brusso RC, Wasserman ME, Fisher SL. Enabled for e-learning? The moderating role of personality in determining the optimal degree of learner control in an e-learning environment. Human Performance. 2016; 24(1):60-78.
34. Oxford RL. Language learning strategies: What every teacher should know. New York: Newbury House/Harper & Row, 1990.
35. Parasuraman A. Technology readiness index (TRI) a multiple-item scale to embrace new technologies. Journal of Service Research. 2000; 2(4):307-320.
36. Patterson C. Constructing narrative and phenomenological meaning within one study. Qualitative Research Journal, 2018.
37. Randall S, Crawford T, River J. Us and them: The experience of international nursing students engaged in team-based learning: A qualitative descriptive study. Nurse Education Today. 2020; 92:104527.
38. Rasouli A, Rahbania Z, Attaran M. Students' readiness for e-learning application in higher education, Malaysian Online Journal of Educational Technology. 2016; 4(3):51-64.
39. Reinig M. Review of the theory and practice of online learning. Language Learning & Technology. 2010; 14(1):24-27.
40. Reyna J, Hanham J, Meier P. The Internet explosion, digital media principles and implications to communicate effectively in the digital space. E-learning and Digital Media. 2018; 15(1):36-52.
41. Shirahada K, Ho BQ, Wilson A. Online public services usage and the elderly: Assessing determinants of technology readiness in Japan and the UK. Technology in Society, 2019.
42. Shraim K, Zuheir K. Students' Readiness Towards E-learning: A case study of Virtual Classrooms for secondary education in Palestine. The 3rd Annual Forum on e-learning Excellence in the Middle East. Dubai, 2010.
43. Song L, McNary SW. Understanding Students' Online Interaction: Analysis of Discussion Board Postings. Journal of Interactive Online Learning. 2011; 10(1).
44. Summak MS, Baglibel M, Samancioglu M. Technology readiness of primary school teachers: A case study in Turkey. Procedia: Social and Behavioral Sciences, 2010; 2:2671-2675.
45. Suarez A, Specht M, Prinsen F, Kalz M, Ternier S. A review of the types of mobile activities in mobile inquiry-based learning. Computers & Education. 2018; 118:38-55.
46. Tabbers HK, de Koeijer B. Learner control in animated multimedia instructions. Instructional Science. 2010; 38(5):441-453.
47. Tang YM, Chen PC, Law KM, Wu CH, Lau YY, Guan J, *et al*. Comparative analysis of Student's live online learning readiness during the coronavirus (COVID19) pandemic in the higher education sector. Computers & education. 2021; 168:104211.
48. Tang YM, Au KM, Lau HCW, Ho GTS, Wu CH. Evaluating the effectiveness of learning design with mixed reality (MR) in higher education. Virtual Reality. 2020; 24:797-807.
49. Waryanto N, Tingkat Kesiapan. Implementasi E-Learning di Sekolah Menengah Atas Kota Yogyakarta Jurnal Pendidikan Matematika dan Sains. 2014; 1(2):117-124.
50. Wang Y, Wang H, Shee DY, Measuring e-learning Systems Success in an Organizational Context: Scale Development and Validation Computers in Human Behavior. 2007; 23:1794.
51. Widodo SFA, Wibowo YE, Wagiran W. Online learning readiness during the Covid-19 pandemic. In Journal of Physics: Conference Series, IOP Publishing. 2020; 1700(1):012033.
52. World Economic Forum, 2017. https://www.vajiraoinstitute.com/pdf/2018/27-02/Eco-Index.pdf
53. Yang XB, Yu Y, Xu JQ, Shu HQ, Xia J, Liu H, *et al*. Clinical course and outcomes of critically ill patients with SARS-CoV-2 pneumonia in Wuhan, China: A single-centered, retrospective, observational study. The Lancet Respiratory Medicine, 2020.
54. Zhao Q, Chen CD, Cheng HW, Wang JL. Determinants of live streamers' continuance broadcasting intentions on Twitch: A self-determination theory perspective. Telematics and Informatics. 2018; 35(2):406-420.