Pakistan Journal of Distance & Online Learning
Volume: VII, Issue II, 2021, 87-104

E-Learners' Self-efficacy for Online Courses: Self-efficacy for IT Use as a Predictor for Academic Self-efficacy

Saleha Ali[1]

Abstract

The purpose of current study was to investigate the level of students' self-efficacy, specifically the use of Information Communication Technologies and performing academic tasks for online courses. A quantitative descriptive survey was conducted to explore the problem. The participants were selected from two departments (Arts and Computer Science) of a university. All the students from the Department of Arts were included in study sample and non-proportional random sampling technique was used for selecting participants from the department of CS. In this way, self-tailored five-point Likert Scale was distributed to 603 sampled participants. The study concluded that e-learners' had moderate level of self-efficacy to perform academic tasks and their level of self-efficacy to use ICT was at higher level. There was highly significant positive relationship between academic self-efficacy and self-efficacy to use ICT.The study found that the self-efficacy for IT use is a good predictor of academic self-efficacy. A course on ICT use may be offered to all the e-learners as a pre-requisite for any online course. It may enhance the academic self-efficacy of e-learners.

Keywords: E-learners, self-efficacy, academic self-efficacy, online course

[1] *Lecturer (Education), Virtual University of Pakistan. Email: saleha.ali@vu.edu.pk; saleha.ali812@gmail.com*

Introduction

Distance and online education is emerging day by day as an effective means of learning. Various terms have been used for online learning such as computer-based instruction, mobile learning, e-learning, web-based learning (Gyambrah, 2007).

E-learning provides flexible environment to learners providing them with the ease of place and time with use of modern ICT tools. Use of technology in education is gaining importance and research on distance learning is becoming essential to explore new education trends (Farid, Ahmed, Niaz, Itmazi & Asghar, 2014). E-learning provides students with two instructional opportunities which are: (i) the students can study anywhere, anytime, at home or workplace (ii) hands-on experiences are being provided to distance learners through ICT that makes it easier for students to learn and study (Brooks, Nolan, & Gallagher, 2006).

Anstine, and Skidmore (2005) have completed a sample study of online and traditional courses where face-to-face lessons were found to be teacher-centred, uninteresting, non-engaging, restricted to textbooks, and instructors don't take initiative to explore strategies and latest trends of instructing curriculum. Online teaching takes place in a distance learning environment with no or very less face to face interaction. A student only needs a computer and an internet connection to study in online mode.

There is a need to analyse the level of students' satisfaction in online learning environments because of new trends and tools used as a communication medium between students and teachers (Kaminski, Switzer, & Gloeckner, 2009). Therefore, learners should have a higher level of computer self-efficacy to make decisions, set goals, perform academic activities and the amount of time spent to cope up with the challenging situations (Liew, Tan & Seydali, 2014).

In online mode of learning, the student has greater responsibility of being successful. If students are less confident to use (ICT) information and communication technology, their level of satisfaction might decrease and may lower their academic performance. (Moore & Kearsley, 2011). The learners with high level of satisfaction are found to be more successful at their studies then unsatisfied students (Puzziferro, 2008). Students are using various technologies in their daily life but to study in online learning environments, the students not only need technological skills but also a skill to interact and learn from peers and instructors (Shen, Cho, Tsai, & Marra, 2013). Numerous researches have investigated the relationships between self-efficacy of ICT usage and various computer behaviours (Rohatgi, Scherer, & Hatlevik 2016; Fanni,

Rega, & Cantoni 2013;Bozdogan, & Özen 2014; Tømte, &Hatlevik, 2011; Player-Koro 2012). In literature related to educational processes, computer self-efficacy is proved to be a strong predictor of success in online learning (Alqureshi, 2016; Deimann & Keller, 2006; Gan & Balakrishnan (2017). Other studies indicated that learners face difficulty in online learning (Martin, Tutty, &Su, 2010).So, to be successful and motivated in online environments, the students should have IT self-efficacy of two types. Firstly, learners should be efficacious enough in using distance learning mechanisms to interact with the content provided online, class fellows and instructors. Secondly, there should be a liking for the course content by students.

Previously, there search conducted on online learning in Pakistan focused on students' attitudes, benefits, challenges and issues of online learning (Farid, Ahmed, Niaz, Itmazi & Asghar, 2014; Din &J abeen, 2014; Zaheer, Jabeen & Qadri, 2015; Akhter, & Mahmood 2018;Shahzad 2017;Kundi, Nawaz& Khan 2012;Bughio, Abro & Rashdi 2014;Ahmed, Hussain & Farid 2018). Therefore, this study may be a seminal study on the phenomenon of exploring the level of self-efficacy of students to use ICT in Pakistani context. The researchers also investigated the self-efficacy of IT use as a predictor of academic self-efficacy for online learners.

1 Literature Review

2 Self-efficacy and Online Learning

Bandura has defined self-efficacy as "an individual's belief that he/she is able to complete a given activity" (Bandura, 1997, p. 3). Therefore, if one has a confidence in completing a task, then there is more probability of being successful in it by this increased level of self-efficacy. Moreover, there are four major sources of efficacy of individuals: mastery experiences, social modelling, verbal persuasion and physiological factors. *Mastery experience* is the most effective approach to create strong efficacy among individuals. Bandura believed that success leads to future successes in a particular task while failure leads to obstacles in attempting it again. So, if one is successful in attempting a task, there is a probability of attempting it again. The second source of Bandura's self-efficacy theory is *social modelling*. Most people do not like to attempt the tasks which seems impossible to succeed. Bandura emphasized that observing others similar to yourself succeeding in a particular task can motivate you to accomplish the same task easily. *Verbal persuasion* is the third source of self-efficacy theory. A great way to build self-efficacy is by receiving positive feedback from

others. If a person receives negative feedback, it can lower their self-efficacy. *Physiological factor*is the last source of efficacy. Emotions, moods, physical reactions and stress level could affect tone's personal abilities. A learner may experience low level of self-efficacy if he/she has negative attitude such as anxiety and stress to perform a task. Bandura (1993) considered higher self-efficacy as "fosters intrinsic interest and deep engrossment in activities (p.71)" alternatively, people may have low ambitions and give up easily as a result of lower level of self-efficacy.

Higher level of self-efficacy among students not only predict their higher academic performance but also make them able to cope up with challenging situations in their learning experiences (Alivernini & Lucidi, 2011). E-learners who are less confident in their abilities, may be demotivated to learn and in return may achieve lower grades in their online learning environments. Individuals who are enrolled in online learning courses for the first time, can be less confident in using computers so the structure of online courses should be designed in such a way that can foster the student's efficacy (Taipjutorus, Hansen & Brown 2012).

2.1 Self-efficacy of ICT Usage

Abulibdeh and Hassan (2011) explored a significant difference among students' academic performance and their level of IT self-efficacy. Bong (2004) explored that high level of self-efficacy is the strong predictor of good academic performance. Moreover, it is restricted to a specific academic activity. The results of this study disagree with findings by DeTure (2004) which revealed that IT self-efficacy is not a predictor of success of students in distance education. The students with lower computer self- efficacy may be technology illiterate than those with higher self-efficacy of ICT (Al-Haderi, 2013). It is necessary for online students to have higher level of internet self-efficacy to complete assigned tasks in an online course which is taught through the use of ICT (Choy, McNickle, & Clayton, 2002).Another study by Simmering, Posey and Piccoli (2009) found that computer self-efficacy is not related to motivation but is positively related to prior experience studying in online environments.

Puzziferro (2008) indicated that students' performance is not correlated with IT self-efficacy, whereas it was positively related in Shea & Bidjerano (2010).

Roach and Lemasters (2006) highlighted a reason to take into account internet self-efficacy as indicator of e-learner's satisfaction.

Firstly, online learning depends on e-toolsused inacademic activities such as discussions among peers, projects, assignments, online quizzes etc. Secondly, students may be dissatisfied and frustrated if they face technical problems while using ICT in their performing academic activities.

Tomte and Hatlevik (2011) indicated internet as auseful educational tool and a leisurely instrument for students. University students show moderate level of internet self-efficacy and positive attitudes. Moreover, there are gender differences in learners' perceptions and attitudes i.e. male learners show internet attitudes more positively than those of their female class fellows (Ashong & Commander 2012). Additionally, learners who observe internet as a tool of excitement and fun show more positive attitudes and higher self-efficacy than those who use internet as a practical tool (Peng, Tsai and Wu 2006). Jan (2015) also explored that high level of computer self-efficacy was found in males of more than 35 years and above than younger students.

Chu and Chu (2010) found in their research study that there wasa positive correlation between students' satisfaction and internet self-efficacy while studying in online learning environment. Robles (2006) study contradicts with the above mentioned study as Robles found that internet self-efficacy is not a good predictor of learner's satisfaction in online courses.

To investigate the effect of self-efficacy on online learning, Demiralay & Karadeniz (2010) revealed that the students who access technology and internet for multiple purposes of advanced level, have higher level of self-efficacy to use computers. Pajares (2002) stated that self-efficacy level of an individual can be enhanced by asking them to use ICT in searching and using information, constructing knowledge, skills and experiences. Joo, Bong and Choi (2000) explored the effect of self-efficacy for self-regulated learning, internet self-efficacy and academic self-efficacy on students' academic achievement in online mode of teaching and learning.

2.2 Academic Self-efficacy

Academic self-efficacy can be defined as the level of confidence of an individual in their ability to accomplish academic activities. Further, motivation in learning plays a significant role in supporting the student's academic achievement (Linnenbrink & Pintrich, 2002). Bandura (1993) stated that "depending on fluctuations in self-efficacy thinking, a person can perform poorly, adequately, or extraordinary having same skills and knowledge (p.119)". In addition to Bandura's studies, some authors have

done meta-analysis on the literature related to academic self-efficacy and concluded it as a strong predictor of good academic performance (Miltiadou & Savenye, 2003; Zimmerman, 2000). Huang (2012) also conducted a meta-analysis and reported that academic self-efficacy differs in terms of domains of study (mathematics and social science) and other demographic variables such as age, gender etc.

Jan (2015) explored the relationship between academic self-efficacy, computer self-efficacy, prior experience in ICT and satisfaction. The results revealed a positive correlation for academic self-efficacy and prior experience. Also, academic self-efficacy acts as a strong predictor of satisfaction in online learning. Learners' high level of self-efficacy claims to improve their performance in academic tasks (Jungert & Rosander, 2010)

Honicke and Broadbent (2016) have reported that academic self-efficacy of the learners is strongly associated with their academic performance. In contrast, a study of Cho and Shen (2013) revealed no significant relationship between academic performance of the learners and their academic self-efficacy.

Therefore, if a student needs to be efficacious enough to study an online course, he or she should possess two types of self-efficacy; one is self-efficacy for course content and the other is self-efficacy for online technologies. Distance learners should not only feel efficacious about the course content, but they should also feel efficacious in using online technologies.

3 Objectives of the Study

The researcher explored students' self-efficacy beliefs of online courses. The self-efficacy was explored both for performing the academic tasks and the use of ICT. The objectives of the research study were to:

1. Investigate the students' self-efficacy level for online courses.
2. Explore the relationship between e-learners' self-efficacy for IT use and academic self-efficacy.
3. Ascertain e-learners' self-efficacy for IT use as a predictor of academic self-efficacy.

Research Questions

The research questions of the study are stated below:

1. What is students' self-efficacy level for performing the academic tasks?

2. What is the level of students' self-efficacy to use ICT in their learning process?

Methodology

4 Research design

Following post-positivistic worldview, quantitative approach was adopted to conduct the study. Post-positivistic paradigm allows generalizations of the results to the population. Among the different research methods of quantitative approach, cross-sectional survey design was selected for the current study. This design was considered appropriate because it is easy to administer, and time saving as compared to other designs of survey study.

5 Participants of the Study

The population of the study included all male and female students enrolled in bachelor's and master's degree programs of departments of Arts and Computer Sciencein spring semester taking online courses in a public university of Pakistan. In the department of Arts, there were 303 students in total (Bachelors=163; Masters=140). Because the students of the department of Arts were accessible in number, therefore, census sampling was used to draw a representative sample for the study. For the selection of respondents from the department of Computer Science (CS),150 students from each of the Bachelor and master's degree programs (Total 300) were selected using non-proportional simple random sampling technique. Among the participants, 292 (96%) responded from department of Arts and 257 (86%) responded from the department of CS.

Research Instrument

A self-developed questionnaire was used by the researcher for data collection. The instrument was named as "E-Learners' Self-Efficacy Scale (ESES)". Besides demographic information, ESES consisted of two major sections: Academic Self-Efficacy and Self-Efficacy for ICT use. Academic *Self-efficacy* was measured in terms of e-learner's ability to perform academic tasks successfully i.e., taking, quizzes, writing assignments, appearing confidently in the exams, mastering the content of the course etc. *Self-efficacy for the use of ICT* was measured in terms of their ability to use ICT in their distance learning experiences like using LMS successfully, uploading assignments, emailing, and using exams software efficiently etc. The participants' efficacy level was measured on five points Likert Scale ranging from "Not Confident" to

"Fully Confident".

5.1.1 Validity and Reliability of the Research Instrument

The instrument was validated by seekingthe experts' opinion and conducting a pilot study. Three experts were asked to validate the instrument regarding its relevance to the objectives of the study, appropriateness of language, and its format. Having incorporated the minor revisions by the experts, the instrument was pilot tested.

To find out the internal consistency of the instruments, Cronbach's Alpha was calculated using SPSS 24.The values of Cronbach's Alpha for both parts of the ESES. The internal consistency of the overall instrument was 0.94 Cronbach's Alpha. The reliability coefficients for academic self-efficacy and efficacy for IT use were 0.91 and 0.94 Cronbach's Alpha, which was greater than the benchmark of 0.75 (Field, 2013).

5.2 Data Collection

The lists of the respondents were requested and got from the relative departments. An online survey link generated for the collection of data was circulated to the selected respondents. The respondents were followed up twice a week by the researchers. As a result of frequent follow ups, 96% of the sampled respondents from the Department of Arts and 86% of the respondents of the Department of CS gave their response on the research instrument. The overall response rate was 91%.

5.3 Data Analysis

The scale consisted of continuum from "Not Confident" to "Very Confident" on five points. These five levels were coded from 1 (Not Confident) to 5 (Very Confident). Simple descriptive statistics were used for analysing data for the first objective. For exploring relationship between self-efficacy for IT use and academic self-efficacy, Pearson Correlation Coefficient was calculated. Simple linear regression was applied in order to determine "IT use self-efficacy" as a predictor of "Academic self-efficacy".

Results

Self-efficacy was measured on two factors: academic self-efficacy and self-efficacy to use ICT. Data were analyzed both on the factor level and the item level. To analyse the data, we calculated mean, frequency and standard deviation. Respondents indicated their opinions about each of the questions by marking one of the five options on the scale. The scale of the responses for students' self-efficacy ranged from "Not

Confident = 1" to "Fully Confident = 5". The criteria used to determine the level of efficacy were set as follows:

Table 1
Criteria to determine and interpret the levels of self-efficacy

Scale	Criteria	Level of efficacy
Unconfident = 1	From 1To2.44	Lower level
Confident somewhat = 2		
Confident =3	2.45 to 3.44	Moderate level
Very confident = 4	From 3.45To5	Higher level
Fully confident = 5		

5.4 Factor-wise Analysis of Students' Level of Self-efficacy

Factor wise analysis of students' self-efficacy was done by applying descriptive statistics as shown in the Table 2.

Table 2
Mean and standard deviation of overall and by-factor students' academic and ICT self-efficacy (N=549)

Factors	N	Mean	SD
Academic self-efficacy	549	3.23	0.81
ICT use self-efficacy	549	3.75	0.76
Overall mean	549	3.49	0.78

According to the pre-determined criteria, students have moderate level of self-efficacy to perform academic tasks. Students' level of self-efficacy to use ICT in their learning process was higher. Moreover, the table reveals that overall the students' self-efficacy was at moderate level.

Table 3
Students' level of academic self-efficacy to perform various academic tasksin online learning (N = 549)

Items	NC & CS		C		VC & FC		M	SD
	N	%	N	%	N	%		
Preparing online quizzes and exams.	137	25	184	33.5	228	41.6	3.25	1.08
Earning grades in the courses.	153	27.9	157	28.6	239	43.6	3.18	1.15
Writing a high quality assignment.	133	24.2	175	31.9	241	43.9	3.25	1.10
Taking notes during a video lecture	133	24.3	196	35.7	220	40.1	3.22	1.03
Understanding content of a video lecture.	134	24.4	175	31.9	240	43.7	3.27	1.10
Understanding concepts, skills and knowledge.	132	23.1	189	34.4	223	42.4	3.24	1.05
Mastering the content of the courses.	151	27.5	189	34.4	239	38	3.11	1.03
Applying concept to daily life	148	26.9	185	33.7	216	39.3	3.15	1.09
Asking questions from instructors on MDB.	112	20.4	203	37.0	234	42.6	3.30	1.10
Participating in discussion boards.	126	24	175	31.9	248	45.2	3.35	1.21

The table 3 illustrates that students feel confident to prepare for assessment activities of the semester. The mean scores of their responses related to assessment (item 1, 2 & 3) ranged from 3.18 to 3.25 which showed that their level of confidence in this aspect is moderate. Items 4 - 8 showed that students feel confident in understanding the content of online courses. The mean scores of their responses ranged from 3.11 to 3.27. According to pre-determined criteria, the students had moderate level of self-efficacy about understanding online course content. Students feel confident to participate in online discussions. The mean scores of their responses about discussion (items 9-10) ranged from 3.30 to 3.35which showed moderate level of students' confidence about participating in discussions. Therefore, we can say that students' self-efficacy level for performing academic tasks is at moderate level.

Table 4
Students' level of self-efficacy of ICT use to perform various academic tasks in online learning (N = 549)

Items	NC + SC		C		VC + FC		M	SD
	N	%	N	%	N	%		
Search material online	90	16.4	156	28.4	303	55.2	3.59	1.13
Download course materials online	90	16.4	170	31.0	289	52.7	3.54	1.09
Access & play videos	74	13.5	164	29.9	311	56.6	3.67	1.08
Using a computer	29	5.3	98	17.9	422	76.9	4.21	0.95
Using MS word	24	4.4	102	18.6	423	77.1	4.16	0.91
Sending emails	117	21.3	180	32.8	252	45.9	3.34	1.22
Post queries online	97	17.7	160	29.1	292	53.2	3.56	1.18
Use LMS & exams software	40	7.2	136	24.8	373	67.9	3.95	0.99
Upload assignments	51	9.4	140	25.5	358	65.2	3.90	1.04
Take exams	88	16.1	155	28.2	306	55.7	3.58	1.10

The Table 4 illustrates that students' level of self-efficacy to search for the available material on internet, accessing and playing videos online, and downloading relevant material of the online courses was at higher level with mean sores ranging from 3.54 to 3.67. The items related to the use of computer and MS word have mean scores 4.21 and 4.16 respectively, which show higher level of self-efficacy. While, mean score of item related to sending emails to instructors and other students is 3.34 which shows moderate level of self-efficacy among the students. The items related to the use of software in their online learning environments include posting online queries, using LMS and exams software, uploading assignments and taking exams or quizzes online. The mean scores of these items ranged from 3.56 to 3.95 which showed higher level of self-efficacy.

Table 5
Linear regression of academic self-efficacy and self-efficacy to use ICT

ICT use	Model summary			ANOVA				
Model	R	R square	Adjusted R square	Sum of squares	df	Mean square	F	Sig.
1	.731	.535	.534	192.579	1	192.579	628.274	.000
				167.666	547	.307		
				360.245	548			

Simple linear regression analysis was calculated to predict the academic self-efficacy based on self-efficacy for IT use. The above table illustrates that there is strong correlation between the variables and 54% of variance in academic self-efficacy can be accounted for efficacy for IT use ($R = 0.73$, $R^2 = 0.535$). The ANOVA analysis reflect that the regression model is a good predictor of academic self-efficacy.

Table 6
Regression parameter for self-efficacy for IT use.

Coefficients[a]						
Model		Unstandardized coefficients		Standardized coefficients	t	Sig.
		B	Std. error	beta		
1	(Constant)	.314	.119		2.640	.009
	ICT Use	.778	.031	.731	25.065	.000

a. Dependent Variable: Academic Self-Efficacy

The table 6 indicates that the unit increase in self-efficacy for IT use increases 0.778 in participants' academic self-efficacy. The value*t* = 25.065, p = 0.00, indicates that the self-efficacy for IT use is a good predictor of academic self-efficacy.

6 Discussion

The results revealed that overall students' level of self-efficacy was at moderate level. As online learning is students-centred and self-directed therefore, the level of students' self-efficacy should be improved to perform well in online learning environments. There are very few studies

conducted for measuring self-efficacy of academic activities. Linnenbrink and Pintrich (2002) say motivation and self-efficacy plays a great role in improving students' academic performance. Therefore, to enhance the performance of students, some measures may be taken to improve self-efficacy of the students. Bong (2004) says that measuring self-efficacy is sometimes restricted to specific academic activities. But, in the current study, academic self-efficacy includes tasks like understanding of the course content, preparing exams and quizzes, and participating in discussions.

The present study showed higher level of ICT self-efficacy among the learners. Shea & Bidjerano (2010) explored that students' computer self-efficacy had notable effect on the process of learning in online settings. Similarly, Joo, Bong and Choi (2000) also concluded that computer self-efficacy determines students' success and good performance. On the contrary, Deture (2004) indicated that IT self-efficacy is a poor predictor of success of students. On the other hand, the current study concluded that the IT self-efficacy is a good predictor of academic self-efficacy.

Conclusion and Implications

Overall, e-learners' level of self-efficacy was at moderate level. Students had moderate level of self-efficacy to perform academic tasks in online learning environment but higher level of self-efficacy for using ICT in their learning online. The study concluded that self-efficacy for ICT use is a good predictor of academic self-efficacy for online courses.

The results of the study have implications for the administrators of online courses that instructors may be trained to build improved interaction with students in order to improve their level of academic self-efficacy. The government of Pakistan may incorporate study finding and revise their policy to shift their focus to online education for developing new institutes of such kind in order to decrease burden on traditional institutes because students studying in such online courses are highly satisfied with the studies. In the same way, the higher education institutes and universities may design and launch online courses to reach to a large number of students, especially who do not have access to higher education institutes, in order to provide them the opportunity of education.

Some concrete measures may be taken in order to improve academic self-efficacy of students to enhance their level of satisfaction for online courses. A course on ICT use may be offered to all the e-learners as a pre-requisite for any online course. It will enhance the academic self-efficacy of online learners.

References

Abulibdeh, E. S., & Hassan, S. S. (2011). E-learning interactions, information technology self-efficacy and student achievement at the University of Sharjah, UAE. *Australasian Journal of Educational Technology*, *27*(6), 1014-1025.

Ahmed, M. U., Hussain, S., & Farid, S. (2018). Factors influencing the adoption of e-learning in an open and distance learning institution of Pakistan. *Electronic Journal of e-Learning*, *16*(2), 148-158.

Akhter, H., & Mahmood, M. (2018). Study of the impact of online education on student's learning at university level in Pakistan. *International Journal of Distance Education and E-Learning*, *3*(2), 1-11.

Al-Haderi, S. (2013). The effect of self-efficacy in the acceptance of information technology in the public sector. *International Journal of Business and Social Science*, *4*(9), 188-198.

Alivernini, F., & Lucidi, F. (2011). Relationship between social context, self-efficacy, motivation, academic achievement, and intention to drop out of high school: A longitudinal study. *The Journal of Educational Research, 104*(4), 241-252.

Alqurashi, E. (2016). Self-efficacy in online learning environments: A literature review. *Contemporary Issues in Education Research (CIER)*, *9*(1), 45-52.

Anstine, J., & Skidmore, M. (2005). A small sample study of traditional and online courses with sample selection adjustment. *Journal of Economic Education, 36*(2), 107-127.

Ashong, C. Y., & Commander, N. E. (2012). Ethnicity, gender, and perceptions of online learning in higher education. *Journal of Online Learning and Teaching*, *8*(2), 98-115.

Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning. *Educational Psychologist, 28*(2), 117-148.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: W.H. Freeman.

Bong, M. (2004). Academic motivation in self-efficacy, task value, achievement goal orientations, and attributional beliefs. *The Journal of Educational Research*, *97*(6), 287-298.

Bozdogan, D., & Özen, R. (2014). Use of ICT technologies and factors affecting pre-service ELT teachers' perceived ICT self-efficacy. *Turkish Online Journal of Educational Technology-TOJET*, *13*(2), 186-196.

Brooks, D. W., Nolan, D. E., & Gallagher, S. M. (2006). *Web-teaching: A guide to designing interactive teaching for the World Wide Web* (Vol. 9). Berlin: Springer Science & Business Media.

Bughio, I. A., Abro, Q. M. M., & Rashdi, P. R. S. (2014). Effective online distance learning in Pakistan and challenges. *International Journal of Management Sciences*, *2*(6), 274-279.

Cho, M. H., & Shen, D. (2013). Self-regulation in online learning. *Distance Education*, *34*(3), 290-301.

Choy, S., McNickle, C., & Clayton, B. (2002). *Learner expectations and experiences: An examination of student views of support in online learning*. Leabrook, SA: Australian National Training Authority.

Chu, R. J., & Chu, A. Z. (2010). Multi-level analysis of peer support, internet self-efficacy and e-learning outcomes–The contextual effects of collectivism and group potency. *Computers & Education*, *55*(1), 145-154.

Deimann, M., & Keller, J. (2006). Volitional aspects of multimedia learning. *Journal of Educational Multimedia and Hypermedia*, *15*(2), 137-158.

Demiralay, R., & Karadeniz, S. (2010). The effect of use of information and communication technologies on elementary student teachers' perceived information literacy self-efficacy. *Educational Sciences: Theory and Practice*, *10*(2), 841-851.

DeTure, M. (2004). Cognitive style and self-efficacy: Predicting student success in online distance education. *American Journal of Distance Education*, *18*(1), 21-38.

Din, A. M., & Jabeen, S. (2014). Eliminating educational inequality through e-learning: The case of Virtual University of Pakistan. *Open Praxis*, *6*(4), 321-329.

Fanni, F., Rega, I., & Cantoni, L. (2013). Using self-efficacy to measure primary school teachers' perception of ICT: Results from two

studies. *International Journal of Education and Development Using ICT*, *9*(1), 100-111.

Farid, S., Ahmad, R., Niaz, I., Itmazi, J., & Asghar, K. (2014, February). Identifying perceived challenges of e-learning implementation. In *First International Conference on Modern Communication & Computing Technologies (MCCT'14), Nawabshah, Pakistan*.

Field, A. (2013). *Discovering statistics using IBM SPSS statistics*. Los Angeles: Sage.

Gan, C. L., & Balakrishnan, V. (2017). Predicting acceptance of mobile technology for aiding student-lecturer interactions: An empirical study. *Australasian Journal of Educational Technology*, *33*(2), 143-158.

Gyambrah, M. K. (2007). *E-learning technologies and its application in higher education: A descriptive comparison of Germany, United Kingdom and United States* (Doctoral dissertation). Munich, Germany: Ludwig Maximilians University.

Honicke, T., & Broadbent, J. (2016). The influence of academic self-efficacy on academic performance: A systematic review. *Educational Research Review*, *17*, 63-84.

Huang, E. Y., Lin, S. W., & Huang, T. K. (2012). What type of learning style leads to online participation in the mixed-mode e-learning environment? A study of software usage instruction. *Computers & Education*, *58*(1), 338-349.

Jan, S.K. (2015). The relationships between academic self-efficacy, computer self-efficacy, prior experience, and satisfaction with online learning. *American Journal of Distance Education, 29*(1), 30-40. Retrieved from https://www.learntechlib.org/p/160551/.

Joo, Y. J., Bong, M., & Choi, H. J. (2000). Self-efficacy for self-regulated learning, academic self-efficacy, and Internet self-efficacy in Web-based instruction. *Educational Technology Research and Development*, *48*(2), 5-17.

Jungert, T., & Rosander, M. (2010). Self-efficacy and strategies to influence the study environment. *Teaching in Higher Education*, *15*(6), 647-659.

Kaminski, K., Switzer, J., & Gloeckner, G. (2009). Workforce readiness: A study of university students' fluency with information technology. *Computers & Education, 53*(2), 228-233.

Kundi, G.M., Nawaz, A., &Khan, S. (2010). The predictors of success for e-learning in higher education institutions (HEIs) in N.W.F.P. Pakistan. *Journal of Information Systems and Technology Management, 7*(3), 545-578.

Liew, T. W., Tan, S. M., & Seydali, R. (2014). The Effects of learners' differences on variable manipulation behaviours in simulation-based learning. *Journal of Educational Technology Systems, 43*(1), 13-34.

Linnenbrink, E.A., & Pintrich, P.R. (2002).Motivation as an enabler for academic success. *School Psychology Review, 31*(3), 313-327.

Martin, F., Tutty, J. I., & Su, Y. (2010). Influence of learning management systems self-efficacy on e-learning performance. *Journal on School Educational Technology, 5*(3), 26-35.

Michailidou, A., & Economides, A. A. (2003). Learn: Towards a collaborative educational virtual environment. *Journal of Information Technology Education, 2,* 131-152.

Miltiadou, M., & Savenye, W. C. (2003). Applying social cognitive constructs of motivation to enhance student success in online distance education. *AACE Journal, 11*(1), 78-95.

Moore, M.G. &Kearsley, G. (2011).*Distance education: A systems view of online learning*. Boston, MA: Wadsworth Cengage Learning.

Pajares, F. (2002). Gender and perceived self-efficacy in self-regulated learning. *Theory into Practice, 41*(2), 116-125.

Player-Koro, C. (2012). Factors influencing teachers' use of ICT in education. *Education Inquiry, 3*(1), 93-108.

Puzziferro, M. (2008). Online technologies self-efficacy and self-regulated learning as predictors of final grade and satisfaction in college-level online courses. *The American Journal of Distance Education, 22*(2), 72-89.

Roach, V., & Lemasters, L. (2006). Satisfaction with online learning: A comparative descriptive study. *Journal of Interactive Online Learning, 5*(3), 317-332.

Robles, F. M. R. (2006). *Learner characteristic, interaction and support service variables as predictors of satisfaction in Web-based distance education* [Dissertation].New Mexico: The University of New Mexico.

Rohatgi, A., Scherer, R., & Hatlevik, O. E. (2016). The role of ICT self-efficacy for students' ICT use and their achievement in a computer and information literacy test. *Computers & Education*, *102*, 103-116.

Shahzad, M. U. (2017). A literary review on distance education in Pakistan and future possibilities. *Pakistan Journal of Distance & Online Learning*, *3*(2), 85-102.

Shea, P., & Bidjerano, T. (2010). Learning presence: Towards a theory of self-efficacy, self-regulation, and the development of a communities of inquiry in online and blended learning environments. *Computers & Education*, *55*(4), 1721-1731.

Shen, D., Cho, M. H., Tsai, C. L., & Marra, R. (2013). Unpacking online learning experiences: Online learning self-efficacy and learning satisfaction. *The Internet and Higher Education*, *19*, 10-17.

Simmering, M. J., Posey, C., & Piccoli, G. (2009). Computer self-efficacy and motivation to learn in a self-directed online course. *Decision Sciences Journal of Innovative Education*, *7*(1), 99-121.

Taipjutorus, W., Hansen, S., & Brown, M. (2012). Investigating a relationship between learner control and self-efficacy in an online learning environment. *Journal of Open, Flexible and Distance Learning*, *16*(1), 56-69.

Tømte, C., & Hatlevik, O. E. (2011). Gender-differences in self-efficacy ICT related to various ICT-user profiles in Finland and Norway. How do self-efficacy, gender and ICT-user profiles relate to findings from PISA 2006. *Computers & Education*, *57*(1), 1416-1424.

Zaheer, M., Jabeen, S., & Qadri, M. M. (2015). Role of e-learning in capacity building: An alumni view. *Open Praxis*, *7*(1), 71-81.

Zimmerman, B. J. (2000). Self-efficacy: An essential motive to learn. *Contemporary Educational Psychology*, *25*(1), 82-91.

Ali, S.(2021). E-learners' self-efficacy for online courses: Self-efficacy for it use as predictor for academic self-efficacy. *Pakistan Journal of Distance and Online Learning, 7*(2), 87-104.