E-LEARNERS' MOTIVATION AND THEIR ACADEMIC PERFORMANCE IN CLASS: MODERATING ROLE OF COMPUTER SELF-EFFICACY IN THE USE OF LEARNING MANAGEMENT SYSTEM

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ABSTRACT

This study explored the moderating effect of computer user self-efficacy on the relationship between e-learners' motivation and academic performance. As a key determinant of success in online education, computer user self-efficacy enhances both motivation and learning outcomes. Data were gathered from university students across various campuses, with a total sample of 300 participants (140 males, 160 females, aged 21-45). Participants completed assessments measuring their self-efficacy in computer use (CUSE) and motivation strategies for learning (MSLQ). The findings confirmed a positive correlation between motivation and academic achievement in e-learning. Moreover, computer user self-efficacy was found to moderate this relationship, indicating that students with higher confidence in their computer skills are more likely to translate motivation into academic success. These insights highlight the importance of enhancing digital literacy and self-efficacy to support student engagement and performance in online learning environments.

Keywords: *computer user self-efficacy, motivation, academic performance*

INTRODUCTION

In recent years, Information and Communication Technology (ICT) has significantly shaped social interactions, altering communication, work, and educational practices. The modern era is widely acknowledged as an age of technology, with advancements in information technology transforming traditional learning methods. One major evolution in education is electronic learning, or e-learning, which utilizes digital tools such as Learning Management Systems (LMS) to facilitate academic activities beyond conventional classroom settings. Extensive research has examined various aspects of e-learning, including academic performance, motivation, self-efficacy, cognitive skills, and perceptions of LMS. However, there remains a gap in understanding the role of computer self-efficacy in moderating the relationship between e-learners' motivation i.e., both intrinsic and extrinsic and their academic performance. This study aims to bridge that gap by exploring how students' confidence in using technology influences their motivation and success in online learning.

Existing literature and personal observations indicate that while many students exhibit strong motivation to complete coursework via LMS, some struggle due to a lack of prior experience with computers, particularly those from remote

areas. This lack of proficiency hinders their ability to effectively engage with digital platforms, ultimately impacting their academic outcomes. Research by Lee and Hwang (2007) suggests that students with strong confidence in their ability to use technology report higher satisfaction with LMS compared to those lacking such confidence. Numerous studies highlight the impact of e-learning on students' digital adaptability. Akhter and Mahmood (2018) examined the effects of online education on university students, concluding that it fosters creativity and enhances proficiency in digital tools like MS Excel and MS PowerPoint. Their study, conducted on students at the Virtual University of Pakistan, found that students' familiarity with technology encouraged them to pursue online career opportunities after graduation. Likewise, Widjaja and Victor Chen (2017) explored how intrinsic and extrinsic motivation affect academic performance and engagement with online applications. Their findings indicate that while motivation and participation do not directly improve grades, motivated students tend to develop a stronger belief in their ability to succeed.

Further research has investigated how LMS usage correlates with academic success. Firat (2016) conducted a mixed-method study that revealed students who accessed LMS before attending face-to-face sessions achieved higher scores than those who did not. High-achieving students also engaged with LMS more frequently. This study emphasized the importance of providing students with social support, reinforcement strategies, and strong teacher-student interaction to maximize LMS benefits. Similarly, Kor, Ebay, Demir, and Akmese (2016) examined factors influencing the academic success of distance learners versus traditional students. Their results indicated that female distance learners outperformed their male counterparts and that students from remote areas had weaker digital skills than those from urban backgrounds. Despite these challenges, distance learners demonstrated higher academic success due to their ability to balance work and studies.

Additionally, research by Saboor, Arfeen, and Mohti (2015) explored the link between self-efficacy and personality traits in online and traditional learners. They found that students with higher self-efficacy scored higher on personality traits such as openness and extraversion. However, traditional students exhibited stronger self-efficacy than distance learners, influencing their overall personality development. Steiner, Gotz, and Stieglitz (2013) examined the role of LMS components in motivating learners in large-scale digital education environments, concluding that interactive instruction was more effective than direct instruction in engaging students. Their study highlighted that learners who value LMS tools and incentives tend to be more motivated. Radovan (2011) analyzed the relationship between motivation, learning strategies, and academic performance in distance learners. His study found that students who practiced self-regulation and exhibited intrinsic motivation achieved higher academic scores. These findings align with Lee and Hwang's (2007) study, which emphasized that students who confidently navigate LMS platforms report greater satisfaction and engagement. Haider and Najam (2023) conducted a similar study and found a positive correlation between self-regulated learning and motivation. Their research suggests that e-learners with higher intrinsic motivation are more likely to regulate their learning process than others.

Overall, integrating these research insights underscores the crucial role of computer self-efficacy in e-learning. While motivation whether intrinsic or extrinsic drives students to engage with digital platforms, their technological proficiency determines their satisfaction and academic performance. This study aims to explore how computer self-efficacy moderates the relationship between e-learners' motivation and academic success, offering insights into how technological skills enhance online learning experiences.

1.1 Conceptual Definitions
1.1.1 E-learner's Motivation
Students have fewer opportunities to build a direct relationship with their teachers and classmates as compared in face-to-face conventional teaching method. Teachers are not as available to them as in conventional learning who repeatedly recall them regarding completion of semester activities and preparation of exam. Motivation is one of the most important factors which help them in achieving their specific goals. Students who are motivated either to satisfy their learning urge or to get good grades performs better in the class.

1.1.2 Computer Self-Efficacy

It refers to one's belief on his/her capability to use computers and to perform different tasks such as writing assignments, attempting online quizzes, participating in adobe sessions and attempting the mid-term and final-term exam in an efficient manner by using computer and different web-based applications.

1.1.3 Leaning Management System

Learning management system is a web-based application which serves for as variety of tasks such as students' enrolment, on-line quizzes, on-line assignments, graded discussion board, moderated discussion boards in which students ask questions to teachers via online etc.

1.1.4 Conceptual Framework

For the current study, ARCS Model as proposed by John Keller will be used. This model consists of four elements i.e., Attention, Relevance, Confidence and Satisfaction.

E-learners' attention can be gained by using a variety of media which would make their course more interesting. Their course material can relate with some real-life stories which would instigate them towards learning. Moreover, if instructors upload activities that are somewhat contradictory to what e-learners learnt; then it would also grab their attention to read such kind of material. (Keller, 2009)

E-learners should provide independence to select the specific media which they assume that it would be helpful for their learning. Alumni e-learners who got success by adopting this mode of learning may give presentations regarding efficacy of e-learning, which ultimately motivate e-learners to perceive their e-learning course as a useful course. Moreover, e-learners must be aware about the usefulness of their e-learning course in their real life (Keller, 2009).

There is no direct interaction between e-learners and their instructors; so positive feedback must be provided to e-learners. In this regard, instructors must review their activities and give them feedback of how to improve those activities. In this manner, e-learners' confidence can be built. It is very important to share the learning objectives at the very beginning of the e-learning course, so they exactly know what they must achieve in the course. (Keller, 2009).

Instructors / facilitators praise the hard work of those e-learners who perform activities in a well-mannered way. They may give rewards to e-learners in the form of good grades which ultimately lead towards their satisfaction in the course. In such a manner, their sense of accomplishment would also increase. Instructors should design activities which are applicable in e-learners' real life settings. In such a manner, they become more satisfied with their e-learning course that their time and effort is not going wasted, and their learnt knowledge can be applied in their real-life scenarios (Keller, 2009).
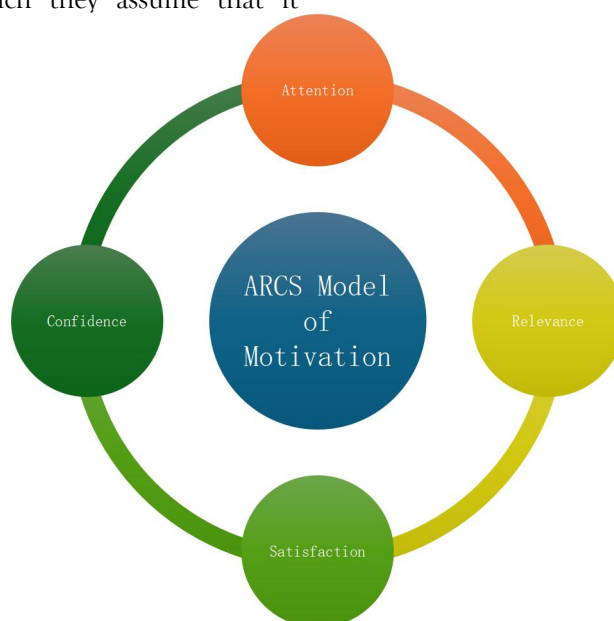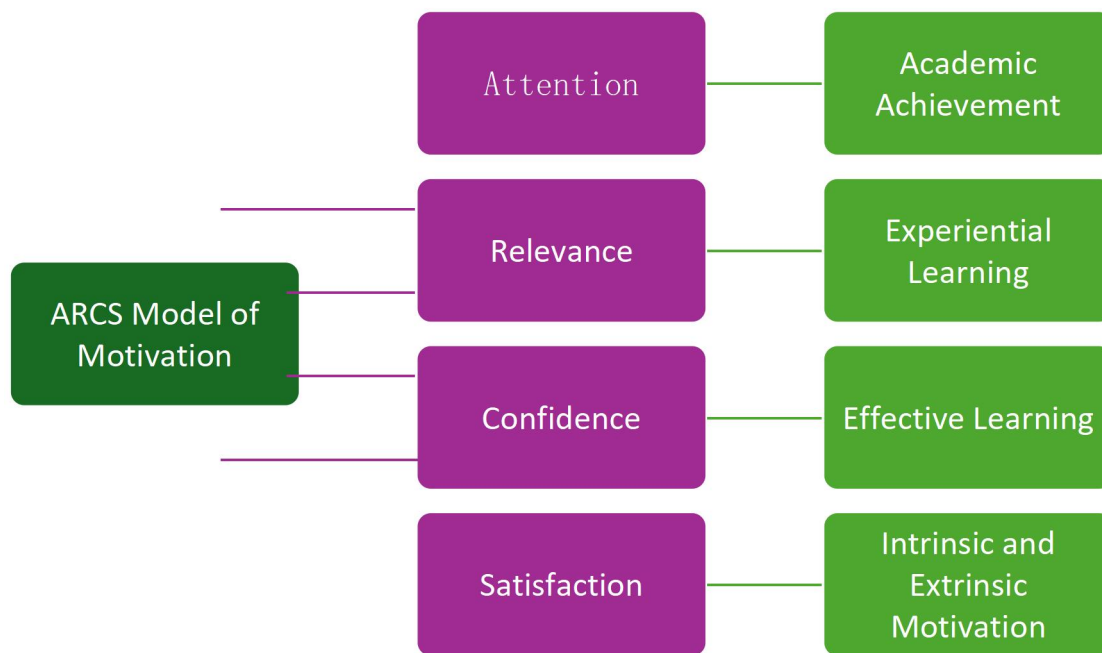
Graphical Representation of Big Five Personality Traits,
Learning Styles & Academic Achievement

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Graphical Representation of ARCS Model & Academic Achievement
1.1.5 Rationale of the Study
Main objective of the current research was to investigate moderation role of computer self-efficacy for LMS usage in relation between motivation and academic performance in the class. In Pakistan, generally those students adopt this distance education who are not able to attend regular classes or have no access to any conventional educational institutes in their surroundings as they live in remote areas. Stewart, et.al (2010) discussed the importance of online education system as it allows individuals who are physically disable, belong to remote areas, engage in jobs etc. can get benefit from this educational system. This study did not only explore the moderating role of computer self-efficacy in relation between e-learners' motivation and their academic performance in class but it also allowed educators and instructors to create more efficient learning environment for learners so students with varied computer self-efficacy skills can be accommodated.
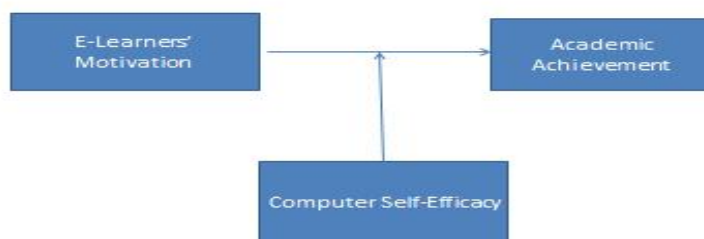
1.1.6 Objectives

Main objectives of the research are:

• To investigate relationship between E-learners motivation and their academic performance in the class.

• To investigate the moderating role of computer, learners' self-efficacy in relation between E-learners motivation and their academic performance in the class.

1.1.7 Hypotheses

• There would be a significant positive relationship between an e-learner's motivation and their academic performance.

• There would be a significant positive relationship between an e-learner's intrinsic motivation and their academic performance.

• There would be a significant positive relationship between an e-learner's extrinsic motivation and their academic performance.

• Computer self-efficacy in using the LMS is likely to moderate the relationship between an e-learner's motivation and their academic performance.

1. Method

Current research is quantitative in nature and applied cross-sectional correlational research design to explore the E-learners' Motivation and their Academic Performance in Class: Moderating role of Computer Self-Efficacy in the Use of Learning Management System. A purposive sample was comprised of a total of 300 youth participants (male=150, female= 150) with age ranged from 18 to 30. Sample was collected from different campuses of Virtual University of Pakistan. Participants were provided with detailed study information, with written informed consent obtained. Privacy was ensured, and all participants were informed of their right to withdraw, with secure handling of personal data and access to support if needed.

2.1 Research Design

Correlation research design was used to determine the relationship between E-learners motivation and their academic performance in the class. Moreover, this research design was also used to determine moderating role of computer self-efficacy in the relationship between E-learners' motivation and their academic performance in the class

2.2 Sample

Through purposive sampling strategy, data was collected from 300 BS last semester students at Virtual University of Pakistan including both girls (n=150) and boys (n=150). Their academic history was collected through their students' history available in VIS (Virtual Information System).

2.3 Inclusion Criteria

• E-learners from Virtual University of Pakistan across nationwide

• Males and Females with age ranged 20-45

• E learners who must complete their last semester

2.4 Exclusion Criteria

E Learners who are engaged in computer-based jobs, any web-based application job was excluded as they had high computer self-efficacy which may become the confounding variable.

2.5 Operational Definitions of Variables

E-learners' Motivation

Motivated Strategies for Learning Questionnaire were used to measure students' motivation level. High scores on this questionnaire depicted high level of motivation and low scores depicted low level of motivation.

• High levels of intrinsic motivation and self-efficacy were associated with higher levels of academic achievement. (Pintrich & De Groot, 1990)

• High levels of self-regulation were correlated with higher levels of academic achievement. (Pintrich & De Groot, 1990)

Computer Self-Efficacy

Computer User Self-Efficacy scale was used to measure students' self-efficacy about using computers. High scores on this scale depict high level of self-efficacy and low scores depicted low level of self-efficacy.

• I find working with computers very easy (Cassidy & Eachus,2002).

• I find that computers are getting in the way of learning (Cassidy & Eachus,2002).

Learning Management System

E-Learners' academic performance was assessed by using their academic records, i.e., assignments, online quizzes and other assessments available in LMS.

2.6 Instruments

Motivated Strategies for Learning Questionnaire by Pintrich, Smith, Garcia &McKechnie (1991) and adapted by Buyukozturk, Akgun, Ozkahveci&Demirel (2004). MSLQ questionnaire comprises 81 items. It is a self-report instrument, and it was designed to measure students' intrinsic motivation, extrinsic motivation and other orientations of motivation as well as different learning strategies such as rehearsal, elaboration etc. which are adopted by students. Its early versions were used to assess the learning effectiveness in learning any course for undergraduate students. Later, its refined version was administered at college students. This instrument comprises 15 subscales. Six subscales are from motivation section and nine subscales of learning strategies. It is a 7-point Likert scale. Scores for each subscale are computed by taking the mean of items in that subscale. Some of the items are negatively worded items and reverse scoring is used for those items. MSLQ had good reliability; Cronbach's alpha values for most of the subscales were greater than .70. There was a complete correlation between the subscales of MSLQ which shows its greater validity (Anthony & Artino, 2005).

Computer User Self-Efficacy (CUSE) scale was developed by Simon Cassidy and Peter Eachus in 2002. This tool was developed to measure self-efficacy of computer users. Self-efficacy refers to an individual's belief that he/she can successfully perform any task. Computer self-efficacy refers to an individual's beliefs that he/she can use a computer and its different web-based applications in a proficient manner. The rationale of developing this scale was to know the impact of computers in all aspects of life and specifically in the field of higher education where students must complete various tasks by using computer technology. This tool was developed in two phases. Sample was comprised of university students (age range 18-52) from different programs of the Faculty of Health. During phase I, it consisted of 47-items with a 6-point Likert scale. In the second phase, items were refined to 30 items. The internal Consistency of this scale was alpha = 0.97, N = 184 while test-retest reliability was also high (r = 0.86, N = 74, p < 0.0005). Construct Validity and Criterion validity was used to measure validity and they were significant. Statements of this scale were comprised of computer users' experiences regarding their familiarity, confidence, troubles which they face etc. while using computers. All 30 items were scored on a 6-point Likert scale. Half of the items were positively worded while half were negatively worded items. (Cassidy & Eachus, 2002)

2.7 Procedure

Data was collected online. The demographic sheet, which was prepared by researcher consists of participant's age, gender, semester, GPA in the last semester. Participants were given booklet comprised of Demographic sheet, MSLQ, CUS via online. For this purpose, researcher at first got permission to collect data from the concerned authority. Upon getting the approval from the authority concerned, data was collected from the targeted participants. In this regard, the following ethical considerations will be followed:

- Researchers got permission from authors of the scales, so researchers used them for the data collection purpose.
- Informed consent was taken from the participants.
- Participants ensured that the information provided would remain confidential and it would be used only for educational purposes.
- Participants had the right to withdraw the research project at any time. In this situation, the information provided was disposed of as per standard criteria.

2. Results

Table 1

Psychometric Properties of Study Variables (N=300.)

Variables	k	M	SD	α	Range	
					Z Potential	AActual
		56.52	11.40	..81	16-151	17-83
Motivated Strategies	15					
Computer User Self Efficacy	225	96.82	19.01	..92	26-134	27-145

Note: M = Mean; SD = Standard Deviation; k = Number of items; Skew = Skewness; Kurt = Kurtosis

Table 1 shows the descriptive statistics, including Cronbach's alpha coefficients, means, standard deviation and range.

Table 2

Variables	2	3	4
Academic Achievement	.172*	.177*	.165*
Computer User Self-Efficacy	___	.283*	.212*
Intrinsic Motivation	___	___	.620*
Extrinsic Motivation	___	___	___

Table 2 shows a significant positive correlation between academic achievement and computer user self-efficacy (r= 0.172, p < 0.05), indicating that as academic achievement increases, computer user self-efficacy also increases. This strong positive relationship suggests that these two variables are closely associated. Moreover, the relationship between academic achievement and motivation is positive (r= -0.177, p<.05), Additionally, there is a significant positive correlation between and computer user self-efficacy and motivation (r= -0.165, p<0.05), suggesting that as motivation increases, computer user self-efficacy also increases.

Table 3
Moderating role of computer self-efficacy in the relationship between extrinsic motivation and academic performance

| Predictors | Model 1 B | Outcome: Academic performance | |
| | | Model 1 | |
		B	95% CI
(constant)	72.08*	72.264*	(71.190, 73.337)
Extrinsic motivation	1.05	1.15*	(2.241,.078)
Computer SE	1.01	.87*	(1.96,.207)
Extrinsic motivation x computer SE		1.186*	(2.268,1.14)
R^2	.053	.083	
ΔR^2		.01	
F	4.12*	4.44*	
ΔF		4.78*	

*p<.05, **p<0.01, ***p<.001

Table 3 shows moderating role of computer self-efficacy in the relationship between extrinsic motivation and academic performance. In Model 1, the R^2 value of .053 indicated 53% variance the outcome variable F (1,246)=4.12, p<.05. These findings indicate that extrinsic motivation (B=1.15, p<.05), computer self-efficacy (B=0.87, p<.05) and extrinsic motivation x computer SE(B=1.186, p<.05) has positively predicted academic performance.

3.   Discussion
Learning Management Systems (LMS) play a pivotal role in online education, providing students with a structured platform to access course materials, engage in discussions, and complete assessments. However, their effectiveness depends not only on learners' motivation but also on their ability to navigate these systems with confidence. This article examines the relationship between motivation and academic performance while exploring the moderating effect of CSE.

Motivation is a fundamental predictor of academic achievement, influencing engagement, persistence, and learning outcomes. Research has consistently shown a positive relationship between motivation and academic success which supported the first hypothesis. Radovan (2011) found that students with strong self-regulation and motivation tend to achieve higher academic scores than their peers. Steiner, Gotz, and Stieglitz (2013) revealed that students who value LMS components and incentives experience greater

engagement and performance improvements. Similarly, Motivation also affects time management, participation in learning activities, and overall satisfaction, all of which contribute to enhanced academic outcomes (Ryan & Deci, 2000).

Intrinsic motivation arises from an individual's inherent interest, curiosity, and desire for self-improvement. Students driven by intrinsic motivation tend to engage more deeply in learning and exhibit higher persistence. It was evident from the result findings that there is a significant positive relationship between intrinsic motivation and academic performance. Ryan and Deci (2000) highlighted that intrinsically motivated students frequently adopt self-regulated learning strategies, leading to greater long-term academic success. Similarly, Radovan (2011) found that self-regulated, intrinsically motivated learners outperform those who rely on external rewards. It has been observed that motivation leads to higher academic success. Manganelli et al. (2019) emphasized that students with autonomous motivation develop critical thinking and problem-solving abilities, leading to higher academic performance in online settings.

Extrinsic motivation refers to learning driven by external factors such as grades, certifications, and career advancement. While it may not lead to deep learning, it can still positively impact academic achievement. It was evident from the result findings that there is a significant positive relationship between extrinsic motivation and academic performance A study conducted by Steiner, Gotz, and Stieglitz (2013) found that students who respond to LMS-based rewards and incentives are more likely to stay engaged and perform well. Deci and Ryan (1985) suggested that extrinsic motivation is particularly beneficial when aligned with students' personal or professional aspirations. Moreover, extrinsic motivation plays a role to gain more knowledge about computer usage. Lee and Hwang (2007) found that students who believe in their ability to use computers tend to be more satisfied with LMS platforms, indicating that extrinsically motivated learners benefit from structured digital support and external incentives.

While motivation influences academic performance, a student's ability to use LMS features effectively determines how well they apply their motivation in practice. Computer self-efficacy (CSE) serves as a moderating factor in this relationship. In this regard, Binyamin et al. (2018), applying the Technology Acceptance Model (TAM), found that students with high CSE perceive LMS tools as easier to use, leading to greater engagement and improved performance. Kömürcü (2021) reported that CSE accounts for 30.2% of the variance in academic success, suggesting that students who feel confident in their technical abilities are more likely to excel. Moreover, Chien (2012) discovered that CSE enhances the relationship between system usability and learning effectiveness, indicating that even highly motivated students may struggle if they lack confidence in using LMS tools.

3.1. Implications

The findings of this study hold significant implications for educators, policymakers, and instructional designers in online education. Since both intrinsic and extrinsic motivation positively influence academic performance, educators should implement strategies that foster self-regulated learning while also providing external incentives, such as digital badges or performance-based rewards, to maintain engagement. Additionally, the moderating role of computer self-efficacy highlights the need for targeted digital literacy training to ensure that students can effectively navigate LMS platforms. Institutions should invest in user-friendly LMS designs, technical support services, and training workshops to enhance students' confidence in using these systems. By addressing both motivational and technological factors, e-learning environments can be made more inclusive, engaging, and conducive to academic success, ultimately improving learning outcomes for a diverse student population.

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