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*Article*

## Effects of Educational Digital Literacy, Educational Aspirations, Self- Directed Learning on E-Learning Motivation and Effectiveness

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### Abstract

Digital and online platforms have undergone a significant transformation in recent years, and their adoption by educational institutions is steadily increasing. It is therefore essential to evaluate the influence of these factors on students' learning effectiveness. Accordingly, the primary objective of the present research is to examine the impact of educational digital literacy, educational aspiration, and self-directed learning on e-learning motivation and e-learning effectiveness. The mediating role of e-learning motivation is also explored in this study. A seven-point Likert scale questionnaire was developed to collect data from students, who constituted the study population. A convenience sampling technique was employed, resulting in a usable response rate of 57.41%. The data were analyzed using Smart PLS 4 as the analytical tool and SEM as the statistical technique. The findings reveal that educational digital literacy, educational aspiration, and self-directed learning have a significant positive effect on online learning motivation. Furthermore, e-learning motivation demonstrates a strong relationship with e-learning effectiveness. The results also confirm the mediating role of e-learning motivation between educational digital literacy, educational aspiration, self- directed learning, and e-learning effectiveness. This study contributes theoretically by highlighting the effect of these variables on e-learning effectiveness. The findings are also practically valuable for policymakers and educational institutions seeking to enhance students' academic performance.

### Keywords

Educational Digital Literacy, Educational Aspiration, Self-directed Learning, E-learning Motivation, E-learning Effectiveness.

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## Introduction

We are living in the digital age, where education has become easily accessible to students through various digital platforms. Education plays a key role in the development and growth of students. Education equips students with competencies, values, and knowledge to meet the changing global demands. In the context of the academic environment, education plays a vital role in shaping students' aspirations, developing self-directed learning behavior, and improving literacy skills (Shlenova et al., 2025). All these factors develop capacity and motivation among students to achieve excellence in their academic careers. Moreover, educational institutions serve as a foundation to promote lifelong learning, resilience, and critical thinking among students, thereby ensuring academic excellence and a significant contribution to society (Zuo, Zhang, & Huang, 2025). The usage of digital technology in the education sector has increased since last decade. Currently, online platforms and digital technologies play a very important role in facilitating learning and delivering educational content (Martínez-Mireles et al., 2025). With the help of digital technology, educational content has become more personalized, flexible, and accessible.

Educational aspiration is one of the very important factors, as it serves as a key driver of students' long-term success, student engagement, and student motivation (Moody et al., 2022). Educational aspiration reflects students' future-oriented expectations and goals that impact their behavior and attitude towards education. From the perspective of online education, where autonomy and flexibility have replaced the conventional classroom environment, it has become very important that students have clear aspirations. There is a high probability that students with high aspirations will overcome different challenges, including feelings of isolation, technological barriers, and self-discipline issues (Reddy, Raj, & Chand, 2025). It is very important to understand this factor as it provides important insight the way academic outcomes, learning strategies and persistence is shaped in online platforms.

In recent years, the education sector has been profoundly influenced by digital technology. Students are adopting new strategies to pursue education because of this digitalization trend (Strielkowski, 2022). In this digital era, learning has been extended across leisure, work, and study activities. Students can use the internet to acquire knowledge due to advancements in educational technology. The younger generation is more attracted to digital devices such as smartphones, laptops, and computers, which were less used by their predecessors (Lingga et al., 2024). Therefore, there is need to understand digital literacy to maximize the benefits modern technology.

Furthermore, self-directed learning is an important student psychological process that directs a student to understand how a problem is solved and to gain knowledge. In the present century, self-directed learning is one of the key aspects for students to face various challenges of the current era (Richter et al., 2025). In online learning, the factor of self-directed learning is very important as it enables students to take full responsibility for their progress. It is crucial for students to manage their time in online education due to the lack of constant supervision (Chen et al., 2023). As a result of this approach, students' lifelong learning, adaptability, and critical thinking are enhanced, making them successful in the online environment. Therefore, the role of self-directed learning in ensuring student success is very important for educationists to understand. Student motivation holds the key position throughout the education process, especially from the perspective of e-learning. Researchers have pointed out that e-learning is a crucial element through which students acquire skills and knowledge. Students' motivation to learn using digital tools is very important in the present era (Elshareif & Mohamed, 2021). Unlike the traditional classroom environment, it is the responsibility of students to engage, stay focused, and manage their time independently with digital platforms. Students overcome challenges, complete tasks, and actively participate in educational activities due to motivation. Continuous learning is encouraged, confidence is boosted, and persistence is enhanced among students because of motivation in the digital environment. Therefore, the potential of e-learning opportunities is enhanced due to the factor of motivation (Farrokhnia et al., 2025).

The focus of higher education institutes has shifted from being an education provider to a learner-centred approach due to the increased use of technology in the learning process. In the environment of online learning, outcome-based measures are very important (Kerimbayev et al., 2023). Learning effectiveness indicates the extent to which the objectives of learning are achieved in the context of internet-based learning (Rahman et al., 2025). Therefore, it is very important to understand the factors that are vital to improve the

learning effectiveness of students in present digital era. Therefore, this study intends to examine effect of educational digital literacy, self-directed learning, and educational aspiration on e-learning effectiveness through mediation of e-learning motivation among students.

## Literature Review

### *E- Learning Motivation and E- Learning Effectiveness*

In literature, learning effectiveness is referred as the outcome of the participation of students in a certain activity of teaching over a specific time period (Lei, Chen, & Luo, 2024). Effective learning is the expectation of students, teachers, parents and the purpose of education. Scholars pointed that learning effectiveness include learning progress, learning performance and learning achievement of students. Scholars mentioned that all these factors include values, experimental skills, learning quality, problem solving ability, scientific attitude and conceptual knowledge. Researchers found that a few factors can impact learning effectiveness of students. These factors include environment factors, family background factors and teaching factors. Learning effectiveness is also enhances by other elements including technical assistance, arrangements of online classes and clear guidelines for e- learning (Tsang et al., 2021). Studies has referred learning motivation as motivation that can maintain and trigger learning behavior of students (Davidovitch & Dorot, 2023). The factor of motivation plays very important role to complete educational goals. Studies has referred learning motivation as guidance of student to learn and need of motivation. The study by Wang, Zhang and Chen (2021) refer e-learning motivation as the student's driving force in digital learning process. Learning strategies and learning motivation hold high association among them. More approaches are adopted by students who have comprehensive learning motivation. Knowledge acquisition of students is affected by students' level of motivation. Hence, it is one of the important factors of student's success. Motivation of students to learn effects students motivation including educational resources, and leadership ability of the teachers (Singh, 2024).

Several past studies have discussed outcomes and factors associated with e-motivation. Learning motivation is discussed in literature as force that is externally and internally inspired, to maintain or initiate willingness to complete task of learning to achieve valued outcome. The academic commitment of teachers and students, both is affected by the variable of motivation. Moreover, in the process of online learning, level of motivation is important to transfer knowledge (Kamberi, 2025). High level of motivation is important for success of students who have failed academically in past. Learning motivation significantly affects academic performance, showing positive correlation among both factors. It means that in case motivation of students is increased, it will positively affect learning performance. In other words, academic performance of students will improve as well (Lei et al., 2024). Effectiveness of learning in context of e-learning is improved by e-learning motivation. Stronger motivation of learning will create better student effectiveness (Özhan & Kocadere, 2020). The study by Hongsuchon et al. (2022) confirmed that learning motivation have positive effect on learning effectiveness. Therefore, this study proposed the following hypothesis:

**H1:** *E- Learning Motivation has a significant impact on E- learning effectiveness.*

### *Educational aspirations and E- Learning Motivation*

It is responsibility of educators to provide education to every individual. Education enables an individual to achieve maximum in life and contribute positively to society. Literature has defined educational aspiration as future performance of an individual on task that is familiar which is expected by the individual to reach (Sharma & Ankita, 2025). Educational aspiration is the desire for happiness, joy and fulfillment that lies deep in the heart of students. It is the voice that encourages students to perform well in the arena of education. Sometimes, it also plays the role change in the life of students. The personality of students is significantly affected by educational aspirations. It is one of the universal feature of personality that is vital in the failure and success of student (Amida, Algarni, & Stupnisky, 2020). On the other hand, motivation plays an important role to achieve goals of life and serves as vital component of aspiration. Students who have high aspiration in the form of achieving professional growth and obtaining advanced degrees, they view e-learning as one of the most important path to reach these goals (Sharma & Ankita, 2025). On the other hand, e-learning motivation is affected by several different factors including personal educational goals, perceived usefulness of educational

content, and self-discipline. High level of aspiration develop relevance that make as student more motivated to achieve educational goals (Jrall & Kiran, 2023).

Furthermore, past studies show that students who are ambitious regarding their education are more adaptive towards online education (Bessadok & Bardesi, 2023). They remain self-regulated to learn skills because of their motivation. They stay committed to achieve their tasks by utilizing digital resources. Therefore, educational aspirations has significant effect on e-learning motivation creating success and persistence (Yahiaoui et al., 2022). Similarly, the study by Lacey et al. (2022) also showed that educational aspiration has positive effect on e-learning motivation. Therefore, below given hypothesis is formed:

**H2:** *Educational aspiration has a significant impact on E- Learning Motivation.*

### ***Educational digital literacy and E- Learning Motivation***

According to studies, digital literacy is referred as ability of students to engage, understand and use digital technology in effective manner (Falloon, 2020). Educational digital literacy is not only based on technical skills that are required for the navigation of digital platform but also is based on ethical consideration, information literacy and critical intelligence in the context of digital arena (Wei, 2024). Digital literacy shows the ability of student to act effectively, appropriately and purposefully and having clear understanding while interacting with communication technology. Usage of technology for students is becoming increasingly important as usage of technology is vital to get benefit for education. Students are getting engaged in e-learning as they are getting digitally literate.

Scholars mentioned that students having high level of digital literacy are willing to use technology for the process of education (Ervianti, Sampelolo, & Pratama, 2023). This result successfully in better academic performance, engagement and learning. On the other hand, students having lower digital literacy find it challenging to use digital tools and are failed to achieve required outcomes (Marín & Castañeda, 2023). Studies have shown that educational digital literacy positively impact the motivation of the individuals (Arsyad, Syariati, & Sukarno, 2023). As explained by scholars that successful learning includes development of cognitive abilities, skills and attitude of student (Erwin & Mohammed, 2022). Therefore, digital literacy plays very important role to improve motivation among students.

Students are equipped to use online resources, platforms and tools effectively with the help of educational digital literacy that enhances their autonomy and confidence in the process of learning. Digital platforms for educational purposes can help students to control their learning. This situation improves academic performance and self- regulation of students (Liu et al., 2024). Furthermore, digital literacy is vital to enhance self-regulated learning and motivation among students. An individual who is skilful to use digital tools for the purpose of education can take part in course materials, look for extra information and work with class fellows. All these factors improve the motivation of students. On the other hand, the barriers to take initiatives and participate in educational process are reduced. On the same grounds, the research by Essuman et al. (2025) revealed that educational digital literacy has positive effect on e-learning motivation. Thus, this study proposed the below given hypothesis:

**H3:** *Educational digital literacy has a significant impact on E- Learning Motivation.*

### ***Self-directed Learning and E- Learning Motivation***

In past studies, self-directed learning referred to as psychological process of students that direct them to understand problem solving techniques and to gain knowledge (Geng, Law, & Niu, 2019). Studies have discussed self-directed learning as the student's ability to take responsibility of progress monitoring, managing resources and goal setting. Self-directed learning is a method that focuses on the learning process rather than educational content. This process involves usage of self-evaluation of the students in which facilitating role is offered by teachers who guide students rather than giving lectures. The process of self-directed learning takes place in setting outside the classroom in which different stages are involved and manages time for self-study. Students who are involved in self-learning participate more actively in the tasks of learning including evaluating milestones, planning of milestones, completion of tasks related to class and material of online learning (Schueler & West, 2023). High level of self-management of students is very important in context of self-directed learning. Some studies mentioned that self-directed learning is like self-regulated learning that emphasizes making choices and goal settings that are very important for the collaborative learning of students.

Students who are high in self-directed learning use different online platforms so they can access resources. Studies also mentioned that self-directed learning is applicable to any group of students and any environment who belong to different age groups. Self-directed learning of students contributes to the usage of intent technology for collaborative learning. Students who are experts in self-directed learning often use course material. Students having high self-directed learning ability will be more persistence towards learning with increased engagement and motivation towards online learning (Altinpulluk et al., 2023). Studies mentioned that there exist strong relationships among self-directed learning and e-learning motivation as focus of both factors is on active engagement, persistence and autonomy of the student (Arzeen, Arzeen, & Muhammad, 2023). Contextual to e-learning, self-directed learning involves responsibility of the learners to take responsibility in terms of managing, identifying and setting goals linking to motivation (Çebi, 2023). Students who are motivated are expected to get involve in self-learning strategies in the form of reflective practices, goal setting and time management. On the other hand, motivation among students is enhanced through self-directed learning, The study by Nair, Sa'dom and Utanes (2023) highlighted that self-directed learning positively affect student learning. Consequently, this study proposed the below given hypothesis:

**H4:** *Self-directed Learning has a significant impact on E- Learning Motivation.*

### **Mediating Role of E-Learning Motivation**

Students develop a few different skills that help in effective utilization, evaluation and access of digital platforms with the help of digital literacy. As a result of these skills, individuals develop confidence to use online education (Erwin & Mohammed, 2022). Whereas the influence of e-learning on student effectiveness is indirect as well (Zakir et al., 2025). Online motivation is one of the important mediators that transform digital literacy into learning behavior. Students apply their digital skills in effective way when they are motivated. Moreover, students get engaged to online content and face different challenges in efficient ways leading to improved academic performance. Therefore, e-learning motivation plays the role of bridge among digital literacy and e-learning effectiveness. Additionally studies has discussed mediating role of e-learning in past such as Vu et al. (2025) and Abd Elghany and Elessawi (2025).

On the other hand, Preacher, Rucker and Hayes (2007) mentioned two conditions for variable to be considered as mediator. Firstly, independent variables must have significant effect on mediating construct. In context of this study, there is direct effect of digital literacy on e-learning motivation (Zhang, 2025). On the other hand, second condition is that mediating variables must affect dependent variables. E-learning motivation positively influence the student's learning effectiveness (Lei et al., 2024). Then, the hypothesis is given as:

**H5:** *E- Learning Motivation is a mediator between Educational digital literacy and E- Learning Effectiveness.*

Students most of the times set higher academic goals because of educational aspiration. Whereas motivation plays important role to impact aspiration on online learning effectiveness. Therefore, e-learning motivation plays the role of mediator by changing aspiration into sustained engagement, persistence and efforts in online learning activities. Students struggled to achieve desired outcomes who have low level motivation but very strong motivation. On the other hand, motivated students develop strategies for consistent participation towards educational goals. Moreover, in past, study by Vu et al. (2025) also discussed mediating part of e-learning motivation in their study. Conversely, according to Preacher et al. (2007) condition of mediation, a variable can be considered as mediating variable if independent variable significantly affect mediating variable, and mediating variable significantly affect dependent variable. In context of this study, Zhang, Wu and Zhang (2024) discussed positive effect of educational aspiration on e-learning motivation, meeting first condition and Özhan and Kocadere (2020) discussed positive effect of e-learning motivation on learning effectiveness, meeting second condition. Thus, this study hypothesised that:

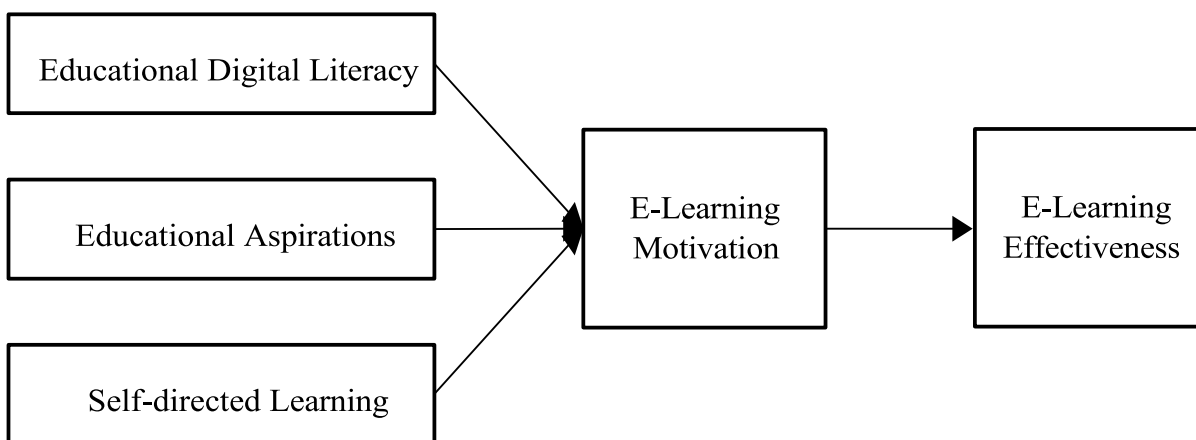
**H6:** *E- Learning Motivation is a mediator between educational aspiration and E- Learning Effectiveness.*

Students are empowered to take different initiatives through self-directed learning. It also helps the students to develop different societies in context of online learning environment. Whereas the impact of self-directed learning on e-learning effectiveness become strong in presence of e-learning motivation. In other words, e-learning motivation plays the indirect role to strengthen this relationship. Students make active participation, consistent effort and persistence to face different challenges. Students having strong motivation

are more likely to focus on self-directed practices. They are also engaged in digital content. Therefore, e-learning motivation plays the role of driving force to connect self-direct learning and student effectiveness of learning. Also, the study of Innab and Alqahtani (2023) discussed the mediating effect of e-learning motivation. On the other hand, the study of Geng et al. (2019) revealed direct result of self-directed learning on e-motivation (meeting first criteria of preacher and Hayes). Whereas, the research of Wang et al. (2021) also revealed the positive effect of e-learning motivation on e-learning effectiveness (meeting second criteria). Thus, this study hypothesises that:

**H7:** *E- Learning Motivation acts as a mediator between Self-directed Learning and E- Learning Effectiveness.*

Below in Figure 1 is given the theoretical framework based on above literature. This figure shows that educational digital literacy, educational aspirations and self-directed learning may have influence on e-learning motivation and e-learning effectiveness.



**Figure 1:** *Theoretical Framework.*

### Methodology

This research adopted quantitative research methodology for the examination of relationship among proposed variables. At the analysis stage, there are three independent variables, one mediating variables and one dependent variable. The respondents of this research were students studying at the universities and enrolled in different programs over there. This research used seven-point Likert scale to get responses from the students. Literature review was conducted to develop questionnaire for response gathering from respondents. The questionnaire was divided in two sections. First section was related to demographic details of the respondents. Whereas second section was related to questions of the items of variables given in proposed model. This study adapted questionnaire items of educational digital literacy from Kabakus, Bahcekapili and Ayaz (2025); scale of educational aspiration was adapted from Bessadok (2022); items of e-learning motivation was adapted from Paola Torres Maldonado et al. (2011); questionnaire of e-learning effectiveness was adapted from Haverila (2011); and the questionnaire of self-directed learning was adapted from Shen, Chen and Hu (2014). This questionnaire was distributed among 290 respondents by using convenience sampling. This study received back 57.41% usable questionnaires from the students. These usable questionnaires were assessed using Smart PLS 4.

### Results

The analysis section of the study starts with demographic analysis. According to statistics, 25.8% of the respondents were male and 75.2% of the student’s female. Additionally, majority of the students fall under the age group of 18 to 30 years i.e. 54.2%, followed by 25.1% students fall under 31 to 40 years, and remaining students had the age of more than 41 years. In terms of marital status, most of the students were not married or single i.e. 51.78% and 48.22% of the students were married.

**Table 1:** *Factor Loading.*

	EA	EDL	ELE	ELM	SDL
EA1	0.758				
EA2	0.834				
EA3	0.824				
EA4	0.856				
EA5	0.752				
EDL1		0.927			
EDL2		0.902			
EDL3		0.916			
EDL4		0.914			
EDL5		0.890			
ELE1			0.859		
ELE2			0.815		
ELE3			0.750		
ELM1				0.906	
ELM2				0.867	
ELM3				0.912	
ELM4				0.904	
ELM5				0.874	
SDL1					0.833
SDL2					0.809
SDL3					0.820
SDL4					0.829
SDL5					0.865

**Note:** SDL: self-directed learning; ELM= e-learning motivation; ELE= e-learning effectiveness; EDL= educational digital literacy; EA= educational aspirations

Next, this study moved towards analysis of the proposed framework. This research used smart PLS 4 for the analysis purpose to identify relationship among proposed variables. The analysis of Smart PLS is divided in two sections namely measurement and structural model (Hair et al., 2017). The first stage of analysis is the measurement model evaluation that begin with measurement model evaluation. According to Hair et al. (2017), benchmark value of items to be carried forwards in measurement model is 0.70. According to Table 1, all items of the study have the values of more than 0.70. It is also the first part of convergent validity assessment. At the later stage of this assessment, reliability and validity of data, and AVE was also assessed.

**Table 2:** *Reliability & Validity.*

	Cronbach's Alpha	CR	AVE
EA	0.865	0.902	0.649
EDL	0.948	0.960	0.828
ELE	0.738	0.850	0.655
ELM	0.936	0.951	0.797
SDL	0.889	0.918	0.691

**Note:** SDL: self-directed learning; ELM= e-learning motivation; ELE= e-learning effectiveness; EDL= educational digital literacy; EA= educational aspirations

Table 2 of the study shows the reliability and validity of the gathered data having values Cronbach Alpha and Composite reliability. Both determinants have value of more than 0.70. These figures meet the criteria as proposed by Hair et al. (2007). Later, AVE was examined founded on criteria of Fornell and Larcker (1981). According to this criterion, AVE values should be more than 0.50. Table 2 of the study shows that AVE values are higher than 0.50, fulfilling given requirements. At this stage, convergent validity of the facts is confirmed.

**Table 3:** Discriminant Validity.

	EA	EDL	ELE	ELM	SDL
EA					
EDL	0.340				
ELE	0.812	0.514			
ELM	0.578	0.495	0.803		
SDL	0.437	0.381	0.592	0.444	

**Note:** SDL: self-directed learning; ELM= e-learning motivation; ELE= e-learning effectiveness; EDL= educational digital literacy; EA= educational aspirations

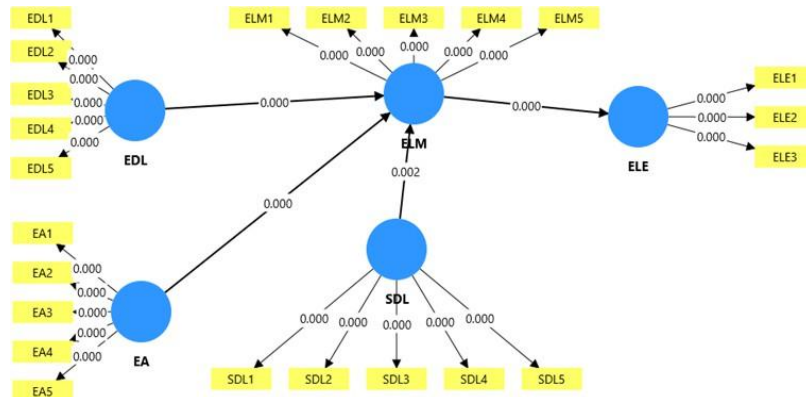
At the latter half of the measurement model evaluation, this study explored discriminant validity through HTMT approach. Consistent with Dijkstra and Henseler (2015), the HTMT values of the matrix meant to be less than 0.85. Table 3 of the study shows that this criterion is fulfilled as all values of the matrix are less than 0.85. AT this stage, measurement model is successfully evaluated.

**Table 4:** R square.

	R-square
ELE	0.459
ELM	0.399

**Note:** SDL: self-directed learning; ELM= e-learning motivation; ELE= e-learning effectiveness; EDL= educational digital literacy; EA= educational aspirations

Later, this study examined structural model of the study. This stage begins with R square assessment, that evaluates the influence of independent variables on mediator and dependent variables. Table 4 of the study shows the R square assessment, reflecting that ELE is affected 45.9% and ELM is impacted 39.9% by the proposed independent variables of the research.



**Figure 2:** Structural Model.

**Note:** SDL: self-directed learning; ELM= e-learning motivation; ELE= e-learning effectiveness; EDL= educational digital literacy; EA= educational aspirations

Moving further towards structural model, bootstrapping procedure was adopted to examine direct and indirect relationships among the variables given in Figure 2. Moreover, Table 5 of the study shows the direct relationship between variables. The statistics shows that EA has significant positive effect on ELM having B=0.367, and t=5.865, confirming hypothesis. Likewise, the statistical figures show that EDL has positive significant impact on ELM, supporting hypotheses with B=0.295 and t=4.211. The results also confirm the relationship among ELM and ELE with B=0.678 and t=12.737. Also, the proposed relationship among SDL and ELM is also supported with B= 0.167 and t=3.041. Table 5 of this research also show the mediating results of the research, confirming the mediating role of ELM among proposed IV's and DV.



**Table 5:** *Direct and Mediating Results.*

	<b>B</b>	<b>SD</b>	<b>T value</b>	<b>P values</b>
EA -> ELM	0.367	0.063	5.865	0.000
EDL -> ELM	0.295	0.070	4.211	0.000
ELM -> ELE	0.678	0.039	17.237	0.000
SDL -> ELM	0.167	0.055	3.041	0.002
SDL -> ELM -> ELE	0.113	0.038	2.948	0.003
EA -> ELM -> ELE	0.249	0.048	5.136	0.000
EDL -> ELM -> ELE	0.200	0.050	4.029	0.000

**Note:** SDL: self-directed learning; ELM= e-learning motivation; ELE= e-learning effectiveness; EDL= educational digital literacy; EA= educational aspirations

### Discussion

The education sector at the global level has evolved with the emergence of new technologies. It is important for educational institutions to examine the role of digital technology in the motivation and e-learning effectiveness of students. Therefore, this research examined the effect of educational digital literacy, educational aspiration, and self-directed learning on e-learning motivation and e-learning effectiveness. The findings of the study revealed that educational aspiration significantly effect on e-learning motivation. From the lens of the respondents, these conclusions show the vital role of education determining the behavior and choices of students. The respondents reported that they are willing to engage in e-learning platforms when their educational objectives are clearly stated. They consider education as a pathway to personal growth, professional success, and future opportunities. Thus, the motivation level is higher among students who have a higher level of educational aspiration.

Students also mentioned that e-learning becomes more purposeful when education is linked to career goals. They perceive e-learning as an accessible and flexible method compared to the traditional process of education in which they must attend classes on campus. Also, the level of awareness regarding education further enhances the motivation level of students, as education today is linked to lifelong learning, global competitiveness, and digital competence. Respondents stressed that they remain consistent in online participation, make better use of educational resources, and complete tasks on time by using digital resources in higher education. In other words, the results highlight that the stronger students are tied to education, the more they are willing to engage in the e-learning environment, and they will remain disciplined. In literature, these findings are similar to the results of [Lacey et al. \(2022\)](#).

The research study results show that educational digital literacy has significant connection with e-learning motivation as discussed by [Essuman et al. \(2025\)](#) in past. The findings determine the role of education in the digital space is expanding with the passage of time. Respondents mentioned that educational institutions should have the capacity to provide online resources so students can stay motivated towards education. Students stated that skills to use technology-based platforms are very important for them in the present age of technology. These skills can play a key role in keeping students motivated towards education. Students also reported their intention to participate in the usage of learning management systems, complete online tasks, and attend online classes as they are highly motivated. Therefore, students perceive digital competence as the main requirement to survive in the educational world. Respondents also mentioned that educational institutions are integrating digital technologies into the curriculum of all fields. Therefore, they understand that success in the professional environment is dependent on the adaptability of digital technologies. Education based on digital literacy provides students with motivation that helps them in completing e-learning activities. Additionally, students revealed that digital technology not only helps them fulfill the requirements of academia but also is instrumental in their professional development. This finding of the study also confirms that students perceive technology as an important factor to overcome the challenges of the modern world.

The statistical findings also highlight that self-directed learning has positive significant effect on e-learning motivation among students ([Nair et al., 2023](#)). This outcome shows the growing need for ownership that students should take to improve their academic performance. The ownership regarding course planning and class attendance must be taken by the students themselves. Results show that students demonstrate high

discipline and responsibility when they are self-directed towards education. As a result, these students are more motivated towards e-learning. Additionally, some respondents reported that they consider self-directed learning an important driver of effective learning because students are empowered to seek knowledge, manage their time, and set goals more effectively. These findings also highlight that in the present era; education is moving from teacher-centric to learner-centric. Students are motivated to use online and digital platforms for education as they perceive education as a personal journey. This usage plays a vital role in their professional and personal growth. As a result of this mindset, students perceive education as more sustainable and meaningful. Moreover, students adopt a proactive learning attitude towards their academia so they can adjust to e-learning platforms. Students revealed that it is difficult to adjust to the digital environment without motivation and self-directed learning behavior. Similarly, the results of the present research confirm that students gain an internal drive that develops motivation to pursue education through self-directed learning.

The results also confirm the direct effect of e-learning motivation on e-learning effectiveness in the present research. These insights highlight the central role of motivation in shaping the educational outcomes of students. Respondents of this study reported that learning effectiveness through digital platforms is enhanced because of higher levels of motivation. Some students mentioned that motivation serves as a fundamental component for their educational success. This becomes even more vital when the online mode of education is used by instructors. The readiness to engage, persistence, and focus to participate in tasks is higher for students who are motivated towards e-learning. Students revealed that there is a high probability that they will use digital platforms for education to improve learning outcomes. The research indicates the significance to use digital platforms to their maximum potential, students should be fully motivated. When students have clear educational goals, they become motivated to use digital platforms for a productive and meaningful extension of their education. Similar results were highlighted in past by [Hongsuchon et al. \(2022\)](#) in past.

The findings also report the intervening role of e-learning motivation in the present research. The results corroborate a significant mediating effect of e-learning motivation between educational digital literacy, educational aspiration, self-directed learning, and e-learning effectiveness. Students' confidence in using digital tools is enhanced by educational digital literacy through increased e-learning motivation. As a result of this confidence, students engage in better assimilation and active participation in educational content along with engagement with digital platforms. Moreover, value perception and the purpose of education among students are developed because of e-learning motivation. Students put more effort into online tasks and improve the effectiveness of e-learning. Additionally, students develop strategic regulation and autonomy in terms of education in the presence of their self-directed behavior. When they can manage each educational aspect efficiently, students develop e-learning motivation that later leads to the efficient use of technology to solve problems, resulting in stronger e-learning effectiveness. Mediating role of e-learning motivation was also confirmed by the research of [Özhan and Kocadere \(2020\)](#).

### ***Limitations and Suggestions***

Like many empirical studies, there are a few limitations in the present study. This research used a cross-sectional research design at the methodology stage of the study. For more in-depth opinions of the respondents, it is suggested to overcome time constraints and use a longitudinal research design in future similar studies. Additionally, this study used e-learning motivation as the mediating variable in the proposed framework. It is suggested to use different dimensions of the same variable as a mediator in upcoming research. Moreover, single mediation was used in the proposed framework. It would be interesting to extend the model towards sequential mediation and include commitment as a mediator as well.

Furthermore, this research used Smart PLS 4 for the analysis of the data gathered from students. It is proposed to use STATA for analysis purposes in future studies. Also, the proposed framework consists of only one mediator, one dependent variable, and three independent variables. There is a need to add a moderating variable in the present model. It is proposed to include social media platforms as a moderating variable that can be tested at the second stage of the model.

### ***Theoretical and Managerial Contributions***

This research extends the body of literature by contributing from managerial and theoretical perspectives. This research is among the few studies that have used e-learning motivation among students, as

most past studies examined the mediating role of motivation as a conventional variable. Thus, this research adds a technological angle to this variable. Moreover, most past studies used student engagement, student commitment, and academic performance as outcome variables in studies related to higher education. This study provides a different perspective by analyzing the role of independent variables on e-learning effectiveness of students.

This research also contributes theoretically by discussing educational aspiration, self-directed learning, and digital literacy as IVs in a single framework. It also contributes managerially by highlighting the importance of digital literacy for students to be successful academically. The results further show that students should be self-dependent for academic achievement. Policymakers in the education sector can use these findings to develop strategies through which students' performance can be improved.

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