International Journal of Education and Social Science; Vol. 11 No. 2; August 2024
ISSN 2410-5171 (Online), 2415-1246 (Print)
Published by Research Institute for Progression of Knowledge

Determinants of Online Education in Bangladesh: The Mediating Role of Self-Motivation

Fahmida Ferdous Mouri
Lecturer
Department of Marketing
EXIM Bank Agricultural University Bangladesh

Md. Kamrozzaman
Director (Incharge)
Higher Secondary Teachers' Training Institute, Cumilla, Bangladesh

Nilofa Yasmin
Director
Center for Global Research Development, USA

Rahima Akther*
Lecturer
Department of Management
Bijoy Smarani College, Bhatiary, Chattogram, Bangladesh

Abstract

Online education in Bangladesh has emerged as a vital resource for students and professionals seeking versatile learning opportunities. E-learning platforms have become popular among learners for their wide range of courses and user-friendly interfaces. With online learning, students can be together in the classroom with an instructor while working through their digital lessons and assessments. When using distance learning, students work online at home while the teacher assigns work and checks in digitally. Therefore, the purpose of this research was to examine the determinants of online education in the mediating role of self-motivation from the context of higher secondary education level in Bangladesh. This research used both quantitative and descriptive analysis methods. A standardized questionnaire was used to collect 201 data points from higher secondary education level students using an online purposive sampling method. A partial least squares structural equation modeling (PLS-SEM) approach was used to evaluate the data and test the hypotheses. The results of the partial least squares structural equation modeling (PLS-SEM) method showed that online education was significantly associated with course curriculum, learning style, and self-motivation. The results also revealed that self-motivation significantly mediates the relationship between learning style and online education in the context of higher secondary education level in Bangladesh. The findings of this research will be crucial for policymakers in Bangladesh to successfully apply an online education system at the higher secondary education level during epidemic conditions.

Keywords: Online education, higher secondary level, determinants, PLS-SEM, Bangladesh

* Corresponding author

1. Introduction

The advent of the digital era has revolutionized the educational environment, rendering online learning a feasible substitute for conventional classroom teaching. The transition has been especially notable in nations such as Bangladesh, where there is an increasing desire for adaptable and easily available educational alternatives. The swift proliferation of digital technology has had a major effect on education institutions globally, offering novel opportunities for instruction and knowledge acquisition via online platforms. In Bangladesh, there has been a significant increase in the adoption of online education, especially in the field of higher secondary school. The motivation behind this change is to tackle the difficulties modeled by conventional educational institutions, such overcrowded classrooms, insufficient resources, and imbalanced access to high-quality education (Kabir, 2020). The COVID-19 pandemic emphasized the significance of online education, as educational facilities had to shift to online education in order to maintain continuity in learning (Rahman, 2021). However, the effective execution of online learning in Bangladesh is impacted by numerous factors that require comprehensive examination.

Bangladesh's educational environment is measured by an expanding young population, with a substantial number of pupils opting for upper secondary education. The conventional education system, on the other hand, encounters obstacles such as extremely populated classrooms, restricted infrastructure, and inequitable availability of high-quality education. These problems highlight the requirement of applying alternate educational delivery systems, such as online education, in order to address gaps and improve learning experiences. The effective application of online education in Bangladesh depends on various elements, such as technological infrastructure, digital literacy, socio-economic conditions, and policy backing, despite the acknowledged potential benefits of this form of education. The higher secondary education sector in Bangladesh plays a crucial role by acting as a link between secondary education and further education or career training. The nation's demographic pattern, characterized by a substantial proportion of young people, highlights the necessity for easily attainable and high-quality education at this stage (BANBEIS, 2019). However, the application of online education is not consistent throughout the nation, as there are disparities in terms of availability and standard of digital infrastructure, degrees of digital literacy, socio-economic conditions, and policy structures (Islam, 2020). Comprehending these factors is essential for policymakers, educators, and stakeholders in the education sector of Bangladesh. It will aid in developing plans that support fair and equal access to high-quality online education, resolving variations, and improving the overall educational framework. Also, the outcomes of this study can provide valuable guidance for future investments in technology and training, thereby approving the long-term feasibility and integration of online education within the country's educational system. Online education can involve students through interactive content, multimedia resources, and content learning experiences. However, maintaining engagement requires careful course design and proactive instructor involvement (Banna et al., 2015). Effective online education requires instructors to be skilled in using digital tools and online pedagogy. Continuous professional development and support are essential (Baran et al., 2011).

Reviewing the extensive literature on factors affecting online education reveals that most researchers have focused on measuring the influence of various factors such as course curriculum, internet self-efficacy, learning style, and self-motivation on aspects like student engagement, online learning, educational motivation, and the quality of MOOCs. They have explored these areas in the context of primary, secondary, and higher education worldwide. However, this study specifically examines the determinants of online education with a focus on the mediating role of self-motivation at the higher secondary education level in Bangladesh, an area that has not been extensively studied. Therefore, this research provides valuable insights into how course curriculum, internet self-efficacy, learning style, and self-motivation influence the online education experiences of students and teachers at this level. This will help policymakers and stakeholders in Bangladesh formulate better educational strategies, especially in the context of epidemic conditions.

The research article is divided into multiple sections. Initially, objective of the study. Secondly, the literature review is provided based on a past study. Thirdly, the theoretical background and hypotheses development have been demonstrated. Fourthly, research methods that are applied to the current research are described. Fifthly, the paper is presented with the results and analysis. Sixthly, the Conclusions and implications section incorporate the consequences of present research and its linkups with the previous studies. At the end of the segment, the shortcomings and potential directions of the research are stated.

1.1 Objective of the Research

The broad objective of this research was to examine the determinants of online education in the mediating role of self-motivation in the perspective of higher secondary education level in Bangladesh. Specific objectives are: to measure the success level of online education in higher secondary level; to evaluate the factors efficacy level of online education in higher secondary level; to explore the impact of course curricular, internet self-efficacy, and learning style on students' self-motivation; to analyze the influence of course curricular, internet self-efficacy, and learning style on online education in higher secondary level; to examine the effect of self-motivation on online education in higher secondary level; to study the determinants of online education in the mediating role of self-motivation in the context of Bangladesh.

2. Review of Literature

2.1 Course Curriculum

The course curriculum in online education functions as a navigational tool for learners, providing guidance on the subject matter, activities, and evaluations. An organized curriculum can improve comprehension, retention, and practical use of knowledge. According to Garrison and Vaughan (2008), an intentionally crafted curriculum that integrates explicit learning goals, pertinent subject matter, and interactive components can result in more efficacious learning encounters in online environments. The course curriculum encompasses both academic and extracurricular activities, including sports, culture, and social life, all of which contribute significantly to student participation (Healey et al., 2014). A separate study has revealed that both social interactions on campus and student identification play crucial roles in facilitating the learning process (Nygaard and Serrano, 2010), online schooling during a pandemic has a deficiency in many aspects. Research indicates that an effective course design should have clearly stated learning objectives, organized course content, manageable workloads for both faculty and students, mixture of appropriate technologies and media, meaningful student performances, and assessments that align with intended learning outcomes (Bates, 2019). An effective program of study for a successful online education system necessitates student engagement with course content, the course's relevance, group discussions, class participation, social assignments, end-of-session quizzes, short videos, specific objectives with learning outcomes, and student feedback for creating course design as well as media (Sharma et al., 2014). Online course design incorporates many educational approaches, such as constructivist, connectivist, and collaborative learning, to promote more involvement and comprehension. Constructivist techniques promote active learning and critical thinking by enabling students to develop their own ideas through engaging in activities and participating in conversations (Anderson and Dron, 2011). Connectivist approaches utilize networks and digital platforms to facilitate learners' collaborative access and contribution to knowledge. The architecture and arrangement of an online course play a crucial role in directing students through the process of acquiring knowledge. Effective course navigation, modules arranged in a logical sequence, and a consistent presentation of materials all contribute to reducing cognitive load and increasing student engagement (Mayer, 2008).

2.2 Internet Self-Efficacy

Internet self-efficacy pertains to an individual's confidence in their capacity to effectively carry out tasks on the internet, such as browsing websites, utilizing online tools, and utilizing electronic assets. This concept is essential in the context of online education, since the learning experience is primarily dependent on technology (Tsai and Tsai, 2003). Increased levels of Internet self-efficacy can improve students' capacity to interact with course materials, actively participate in conversations, and efficiently complete tasks. There is a favorable correlation between self-efficacy and student performance (Alrushiedat and Olfman, 2014). Students that possess a greater degree of self-efficacy demonstrate superior performance compared to those who possess a lesser degree of self-efficacy (Tsai and Tsai, 2003; Wang and Wu, 2008). While self-efficacy plays a crucial role in online learning, its influence on learning outcomes may not always be substantial (Bell, 2007). Learning via the internet settings differ from typical classroom education in that they necessitate students to carry out Internet-related tasks in order to fulfill online assignments. The students' proficiency in utilizing the Internet is believed to be crucial for their academic performance (Chang et al., 2014; Liaw, 2002). Internet self-efficacy refers to the ability to effectively organize and carry out a task that requires internet access to fulfill the assigned assignment (Eastin and LaRose, 2000). Online class satisfaction is determined by the availability and effectiveness of internet facilities. This can be measured through two methods: firstly, by assessing the ability to engage in group discussions, submit group projects, and communicate with the course instructor and classmates through operating systems.

Secondly, by considering the influence of internet inefficiency and inadequate devices on the learning process (Roach and Lemasters, 2006). Research has indicated that students who possess a greater level of Internet self-efficacy are more likely to achieve superior learning outcomes in the context of online education. For instance, research by Eastin and LaRose (2000) found students who possess higher levels of confidence in their internet skills are more inclined to participate in online learning activities and efficiently utilize digital resources. Enhanced participation can result in a more profound comprehension of the course material and improved academic achievement.

2.3 Learning Style

Online education provides a distinct setting that may cater to diverse learning styles by utilizing a range of digital tools and materials. Online platforms have the capability to offer customized learning experiences that are specifically designed to match an individual's unique learning preferences. Visual learners might derive advantages from watching films and info graphics, whilst aural learners may have a preference for podcasts and recorded lectures (Hawk and Shah, 2007). Online education offers students the freedom to select resources that correspond to their preferred learning styles. Online courses are highly impacted by students' learning styles. Students who see the information delivery technique as being appropriate with their learning style are more inclined to actively participate and sustain their engagement (Hsieh et al., 2011). On the other hand, when there is a discrepancy between the teaching methods used and the learning styles of students, it can result in decreased levels of involvement and contentment. Several learning style theories have given rise to assessment tools that can be utilized to classify learners and pair students with teachers and methods that are well-suited to their styles of learning (Keefe, 1987). Literature additionally presents research on the learning patterns of college students across many fields. Online learning can be advantageous in technologically advanced nations (Basilaia and Kvavadze, 2020). The effectiveness of an online learning approach is contingent upon the learners' motivation, satisfaction, and ability to solve problems through interaction (Bignoux and Sund, 2008). The authority should provide educational materials for anyone interested in participating in online teaching and learning (Garrison et al., 2001). Adams et al. (2013) discovered in another study that an online lesson will be efficacious if it is user-friendly and meticulously constructed. Nguyen (2015) also agreed that if the online lesson is appropriately planned, it will be beneficial. In the same vein, Hara and Kling (1999) discovered that there was no discernible disparity in student happiness and academic accomplishment between learning via the internet and face-to-face classes. In another study, Gasevic et al. (2014) discovered that the motivation of participants to complete a course can be affected by their learning style, and the use of appropriate learning methodologies can impact dropout rates. Additionally, their research discovered that incorporating variety and engaging with various learning styles contributes to enhancing the quality of learning. Online platforms have the capability to offer customized learning experiences that are specifically designed to match individual learning styles. Visual learners might derive advantages from watching movies and info graphics, whilst aural learners may have a preference for podcasts and recorded lectures. (Hawk and Shah, 2007). Online education offers students the freedom to select resources that correspond to how they like to learn.

2.4 Self-Motivation

Self-motivation in online education is shaped by a range of internal and external elements, such as individual objectives, enthusiasm for the subject, perceived significance of the coursework, and the learning environment. Within educational contexts, motivation can be classified into two distinct types: intrinsic and extrinsic. Intrinsic motivation is the act of participating in an activity purely for personal pleasure and enjoyment, while extrinsic motivation is the act of participating in an activity because of external rewards or demands (Ryan and Deci, 2000). Within the realm of online education, intrinsic motivation is frequently a more reliable indicator of achievement. Students who possess a true enthusiasm for their studies are more inclined to persevere and thrive, especially in the lack of immediate external incentives (Deci and Ryan, 2000). Motivation is commonly defined as the mechanism that stimulates individuals to satisfy their personal wants and aspirations in pursuit of specific objectives (Pintrich et al., 1993; Alexander and Murphy, 1998). The level of student self-motivation in educational pursuits is mostly linked to their interest in the course topic, as well as their persistence and desire to learn. These factors greatly contribute to their academic performance (Ames and Ames, 1985, Alexander, 2006). Self-motivation is a crucial prerequisite for successful online education. However, online students face greater challenges in maintaining motivation compared to their offline counterparts.

This is down to their lack of experience in distance learning, as well as the feelings of social isolation and frustration caused by technological difficulties, which are not present in traditional on-campus classes (Glenda et al., 2010; Miah et al., 2022). The online learning environment presents distinct advantages and difficulties, as students bear full responsibility for their own learning. Consequently, their self-motivation plays a more crucial role in e-learning compared to traditional classroom settings (Wolters et al., 2005).

2.5 Online Education

Online education is the method of instructing and acquiring knowledge using digital platforms and the internet. It includes a diverse array of formats and techniques, such as totally online courses, blended learning (a combination of online and face-to-face education), and massive open online courses (MOOCs). Online education has gained significant popularity and has become essential, particularly due to technical improvements and worldwide events such as the epidemic conditions. These circumstances have made it necessary to adopt other methods of delivering education. Online higher secondary education provides a convenient and adaptable method for students to further their education, especially when attending regular schools is not possible. Nevertheless, meticulous strategizing, resilient infrastructure, and continuous assistance are necessary to guarantee that students attain a superior education and are well equipped for their future endeavors, be it in further education or the professional realm. Online higher education refers to the use of the internet, e-mail, and other multimedia for teaching and learning in the higher education sector. Means et al. (2009) described online learning as a form of distance education that uses the internet and technological tools. An effective online education system requires the shift from a teacher-cantered approach to a student-cantered one through the use of technology. Duraku and Hoxha (2020) discovered that the teaching method has a crucial role in determining how much technology is integrated into lecture delivery and greatly affects the adoption of online learning. In this context, Honey et al. (2000) asserted that comprehending the interplay among educators, learners, and technology is crucial for the successful incorporation of educational technology. The success of online learning relies on various factors such as program design, comprehension of the online course, and effective use of lecture delivery technology, accurate exam evaluation, and proper presentation of papers (Daradoumis et al., 2014). Sharma and Rani (2014) demonstrated in another study that the course material and its relevance are crucial factors for the efficacy of online education. Research revealed that lectures incorporating tests at the conclusion of the class yielded higher levels of achievement (Breslow et al., 2013). Furthermore, research has demonstrated that movies that include case studies were the preferred choice among students. (Hew & Cheung, 2014). Online education enables students to conveniently access course materials and fulfill homework at their own discretion. This adaptability is especially advantageous for individuals who have additional obligations, such as employment, family, or travel, since it facilitates the harmonization of their educational pursuits with other responsibilities.

3. Theoretical Background and Hypotheses Development

3.1 Integration of Theories

The model combines these theories to offer a thorough comprehension of how many aspects contribute to the achievement of online education. The model examines how course curriculum, internet self-efficacy, learning style, and self-motivation interact to impact students' online learning experiences and outcomes. The significance of internal psychological aspects in the success of online education is emphasized by the mediating role of self-motivation. This theoretical framework provides a comprehensive blueprint for educators, instructional designers, and policymakers to create and execute efficient strategies for online education. It is particularly relevant in contexts such as upper secondary education in Bangladesh, where online education is still in the process of development.

3.2 Instructional Design Theory

The design and substance of the course curriculum have a crucial role in molding the learning experience. This component is impacted by Instructional Design Theory, which prioritizes the creation of educational experiences that enhance the efficiency, effectiveness, and attractiveness of knowledge and skill development. An organized curriculum that adheres to the principles of Constructivism can actively include students in the learning process, promoting a more profound comprehension and retention (Anderson, 2004).

3.3 Social Cognitive Theory

This construct is based on Bandura's Social Cognitive Theory (1986), the theory suggests that self-efficacy, which refers to the belief in one's ability to effectively plan and carry out the necessary actions to handle future conditions, significantly influences how individuals approach objectives, tasks, and problems. Internet self-efficacy, within the realm of online education, pertains to the level of confidence that students possess in their aptitude to proficiently utilize digital tools and resources. Increased internet self-efficacy can result in enhanced participation and continued effort in online learning environments.

3.4 Theory of Multiple Intelligences

The concept of learning styles is related to the Theory of Multiple Intelligences proposed by Howard Gardner (1983). This idea posits that humans possess diverse forms of intelligences and, as a result, acquire knowledge through varying methods. Acknowledging and adapting to various learning modalities, such as visual, auditory, or kinesthetic, in online education can improve student involvement and contentment. This technique is also associated with the theory of Differentiated Instruction, which promotes the adaptation of teaching approaches to accommodate the varied requirements of learners (Tomlinson, 2001).

3.5 Self-Determination Theory

Self-motivation plays a crucial role in achieving educational achievement, especially in self-directed online learning contexts. The concept is grounded in Self-Determination Theory (SDT) developed by Deci and Ryan (2000). SDT highlights the significance of intrinsic motivation, where individuals engage in an activity for the inherent satisfaction it brings, as opposed to extrinsic motivation, which is driven by external incentives. Self-motivation is determined by the fulfillment of three fundamental psychological needs: autonomy, competence, and relatedness. Self-motivation plays a role as a mediator in the model, affecting how the course curriculum, internet self-efficacy, and learning style influence the outcomes of online education.

A course curriculum is a meticulously organised collection of educational material and activities intended to provide guidance for the instruction and acquisition of knowledge in a particular course. The course curriculum functions as a comprehensive manual for instructors and students, guaranteeing the achievement of course objectives and providing a unified and seamless learning experience for students. The word course curriculum pertains to the specific syllabus designed for a given course. A curriculum is a comprehensive compilation of teaching methodologies, educational encounters, and assessment of student achievement, designed to emphasise and assess the desired learning objectives of a particular course. Bernstein (1975) distinguished between a compilation of educational programs and the incorporation of different educational programs. A curriculum is a structured framework or blueprint that provides guidance and direction for a certain field of study. The perspectives of both the instructors and the educational institution play a crucial role in shaping the curriculum. The content of a course significantly influences the approach to teaching that focuses on processes and the delivery of instruction through online platforms (Bolhuis, 2003; Goodyear et al., 2001). The course's technological design has a significant impact on students' learning and enjoyment, as shown in their course expectations (Liaw, 2008; Lin et al., 2008). An active course design yields more advantageous outcomes for students as compared to a normal course design (Black and Kassaye, 2014). Comprehending learning styles is essential for creating effective course design (Wooldridge, 1995). When creating an online course, it is crucial to consider that we are offering an educational experience to students with diverse learning styles. Also, (Jenkins, 2015) highlighted the importance of creating and utilising course design elements to enhance student performance. Online courses that foster independence and encourage learners to take control of their own learning can boost self-motivation. Empowering students to select topics of interest, establish learning objectives, and control the pace of their educational journey cultivates a sense of ownership over their education (Deci and Ryan, 2000). Courses that provide the option to set one's own deadlines and offer several strategies to learn the topic might enhance this sense of liberty. Timely and constructive feedback is essential for sustaining motivation and directing pupils towards development. Formative assessments, such as quizzes, peer reviews, and reflective journals, allow students to evaluate their progress and pinpoint areas where they can improve (Nicol and Macfarlane-Dick, 2006). Well-defined grading rubrics and feedback that are in line with the learning objectives can enhance students' comprehension and drive. Therefore, it is expected that,

H1: Course curriculum has a significance influence on online education.
H2: Course curriculum has a significance influence on self-motivation.
H8a: Self-motivation mediates the relationship between course curriculum and online education.

Internet self-efficacy is also a factor in promoting learning autonomy, which is crucial in online education as students frequently navigate their learning routes without assistance. Having a high level of self-efficacy empowers students to independently address technical problems, proactively seek out extra resources, and effectively oversee their own learning process, reducing their dependence on instructors or peers (Shen et al., 2013). Students that possess a strong sense of Internet self-efficacy are more inclined to proficiently utilize online resources and tools, such as instructional platforms, digital libraries, and communication applications (Joo et al., 2000). This skill allows individuals to get and make use of a wider variety of educational resources, hence improving their overall learning experience. This level of autonomy can result in a learning experience that is tailored to the individual and holds significant value. Internet self-efficacy pertains to an individual's confidence in their ability to effectively plan and execute actions over the Internet in order to accomplish specific objectives. An analysis of variance was conducted to determine the impact of Internet self-efficacy on students' motivation and academic performance. Students with a high level of Internet self-efficacy outperformed those with a low level of Internet self-efficacy on the final exam. Additionally, they possessed a greater sense of self-assurance in their capacity to successfully complete an online course. The impact of web self-efficacy on the dimensions of relevance and confidence in the learning motivation model was greater than that of females' Internet self-efficacy (Chang et al., 2014). Self-efficacy is contingent upon specific contexts and its significant role in forecasting student learning has been validated (Alrushiedat and Olfman, 2014; Hodges, 2008). Hodges (2008) highlighted the imperative of investigating self-efficacy in online learning settings. The rapid advancement of the Internet and computer technology has made one's confidence in utilizing the Internet crucial in online learning environments. Online learning offers students more access to materials, and it is believed that the ability to use the Internet effectively is linked to the quality of web-based training (Bandura, 2002; Hodges, 2008). Self-motivation is essential in online education, as students frequently need to independently govern their learning. Internet self-efficacy has a substantial impact on self-motivation by giving students a sense of capability and competence in the online setting (Bandura, 1997). According to Self-Determination Theory (Deci and Ryan, 2000), Perceived competence and autonomy are essential elements of intrinsic motivation. Increased Internet self-efficacy improves the perception of one's own competence, as students develop a sense of capability in piloting online environments and accomplishing tasks. The feeling of being capable, along with the freedom to control their own learning, encourages internal drive and involvement. Consequently, it is anticipated that,

H3: Internet self-efficacy has a significance influence on online education.
H4: Internet self-efficacy has a significance influence on self-motivation.
H8b: Self-motivation mediates the relationship between internet self-efficacy and online education.

The wide range of learning styles exhibited by students poses distinct obstacles and prospects within the realm of online education. Learning styles pertain to the favored methods by which individual’s process information and gain knowledge. Comprehending different approaches is essential for creating efficient online education systems and promoting self-motivation among learners. A student's learning style pertains to their preferred method of acquiring knowledge. A learning style pertains to an individual's favored approach to assimilating, analyzing, understanding, and retaining information. R. Dunn pioneered the notion of learning styles in 1960. Following that, Kolb conducted research on "Experiential Learning Theory." He conducted these auxiliary studies to substantiate his viewpoint. Keefe (1979) defined a learning style refers to the specific indications that reflect how students perceive, interact with, and respond to their learning environments. According to Gregorc (1979) A student's learning style consists of specific behaviours that indicate how the learner obtains knowledge from their surroundings and applies it to themselves. Dunn and Dunn (1993) a learning style can be defined as the unique and individual means by which each student approaches and retains new information. Ursine (1995) A learning style can be characterized as a consistent and individualized approach that guides us in acquiring information from our immediate surroundings. The term "learning style" encompasses a range of attributes that impact how students cognitively perceive, engage with, and react to educational environments. By understanding learners' learning styles and tailoring learning environments accordingly, it is claimed that the academic achievement of learners can be enhanced (Barbadian, 2000).

The concept of learning styles goals to individualize the learning procedure by recognizing cues about how individuals learn and developing a framework for each learner to study autonomously or in small groups. According to Akkoyunlu (1995), analyzing a student's learning style can be advantageous for educators as it offers a method for enhancing the instructional approach. Identifying a learner's preferred learning style is advantageous to the learner. Therefore, by being conscious of their learning styles, learners can recognize their strengths and weaknesses in learning and can choose a more favorable learning environment, where knowledge can be learnt effortlessly and permanently. When online courses are tailored to match students' learning styles, they perceive the material as more pertinent and captivating, hence boosting their motivation (Deci and Ryan, 2000). For instance, those who are kinesthetic learners may experience higher levels of motivation when they are enrolled in courses that incorporate interactive simulations or hands-on activities. The alignment of learning styles and online education can enhance students' confidence and self-efficacy. As Bandura (1997) notes, self-efficacy, which refers to the belief in one's skills to successfully accomplish a goal, plays a crucial role in motivation. When students possess a sense of assurance in their capacity to excel by employing their favored learning approach, their innate drive to achieve is heightened. Online education provides options for independent learning, enabling students to select their preferred methods of interacting with course materials. This level of independence fosters intrinsic motivation, especially for students who have a learning preference that is congruent with the structure of the course (Pintrich, 2004). Self-paced modules and a variety of evaluation methods can accommodate different learning preferences, helping a feeling of autonomy in the learning process. Consequently, it is anticipated that,

H5: Learning style has a significance influence on online education.
H6: Learning style has a significance influence on self-motivation.
H8c: Self-motivation mediates the relationship between learning style and online education.

Self-motivation is a vital factor in influencing the level of student involvement in online education. Active and involved students are more inclined to engage in conversations, fulfil assignments promptly, and actively seek supplementary resources, all of which significantly enhance their learning outcomes. Students that are self-motivated demonstrate a higher level of involvement with the course material, actively participate in interactive activities, and show resilience in the face of adversity (Artino, 2008). Online education frequently necessitates substantial self-regulation, since students must effectively manage their time and study autonomously. Students who possess a strong sense of self-motivation are able to remain concentrated, adhere to regular study routines, and persist in overcoming challenges (Zimmerman, 2000). Multiple studies have revealed a direct relationship between self-motivation and academic achievement in online courses. For instance, Artino (2007) found that Students that are self-motivated generally attain higher scores and exhibit superior understanding of course material. This correlation exists because students who are intrinsically motivated are more inclined to establish and follow ambitious objectives, actively seek assistance when necessary, and employ effective learning techniques. Self-motivation is strongly correlated with self-regulation, which refers to the capacity to manage one's thoughts, emotions, and actions in order to accomplish specified objectives. Self-regulated learners are actively involved in establishing objectives, closely monitoring their advancement, and making necessary adaptations to their approaches (Schunk and Zimmerman, 2008). Self-regulation is crucial in online education, when direct supervision is minimal. Students that possess self-motivation are more inclined to exhibit self-regulatory behaviour, which ultimately results in improved academic achievements. Self-motivation refers to the ability to internally drive oneself and initiate action in order to achieve goals and complete activities. According to Dörnyei (2020), Motivation and engagement are closely connected, and it is essential to provide motivation in order to foster student involvement. He proposes that every instructional design should strive to maintain student engagement, regardless of the learning environment, be it traditional or online. This is a challenging endeavour in the twenty-first century due to the abundance of distractions. The motivation of learners, whether it arises from classroom experiences or is inherent in the learner, is crucial in the classroom setting (Hedge, 2001). Exploring motivation is a crucial aspect that necessitates thorough investigation in online learning settings (Burston, 2003). In recent years, there has been a surge in the level of interest surrounding motivation in online courses (Li and Tsai, 2017; Kyewski and Kramer, 2018; Zhan and Kocadere, 2020). Although the research did not specifically focus on L2 courses, their findings can be applied to virtual foreign language learners. Hartnett et al. (2011) define Motivation in online learning is a complex phenomenon that is primarily driven by individual qualities and contextual circumstances.

Examining the significance of motivation in an online course is crucial, as students are less inclined to participate (Kyewski and Krämer, 2018). High attrition rates pose motivational concerns for instructional designers in distance education. Consequently, it is anticipated that,

H7: Self-motivation has a significance influence on online education.

In this research, there are three independent variables (course curriculum, internet-self-efficacy, and learning style), one mediating variable (self-motivation) and one dependent variable (online education) have recognized. Based on the previous literatures and discussions, the conceptual model (Figure 1) and research hypotheses (from H_1 to H_{8c}) have been developed.

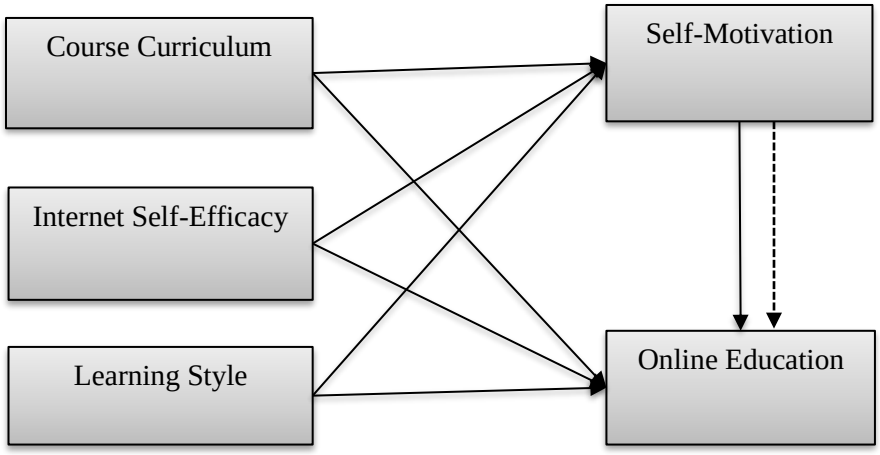

Figure 1. Research model (note: direct paths →; indirect paths ---->)

4. Research Methods

4.1 Sampling Design and Data Collection

The research's respondents included 215 students enrolled in higher secondary education online classes in the context of Bangladesh. In the research, the unit of analysis was the individual student. The research was carried out using a quantitative survey system, with data collected using a standardized questionnaire. To evaluate the hypotheses, an online purposive sampling survey was conducted. Data were collected from the top 20 higher secondary institutions students using an online survey, which was also used in another study (Begum et al., 2024; Hossain et al., 2020). Based on their unique online education practices in higher secondary level, the students were asked to show their level of agreement or disagreement with each assertion. From March 2024 to June 2024, a total of 215 people completed the questionnaire online. Following a rigorous evaluation of the returned replies, 14 surveys were excluded due to insufficient information, leaving 201 responses for statistical analysis. The sample was made up of 55% male students and 45% female pupils. Urban areas accounted for 74% of students, while rural areas accounted for 26%.

4.2 Measurement Instrument

The scale items for assessing the elements of online education in higher secondary level were adopted. Sharma and Rani (2014), Yacoba et al. (2012), Breslow et al. (2013), Roach and Lemasters (2006), Wains and Mahmood (2008), Bignoux and Sund (2008), Garrison et al. (2001), Adams et al. (2013), Wolters et al. (2005), Hartman et al. (2000), Begum et al. (2024) Table 1 demonstrates the latent constructs and their observed variables. The first part of the questionnaire contains general information about the participants (students), such as email address, gender, name of the institutions. The second unit comprises questions for shaping the efficacy level of online education at the higher secondary education level in Bangladesh. On a 5-point Likert scales ranging from strongly disagree to strongly agree, students were asked to indicate their level of agreement or disagreement. A pretest of 40 respondents was conducted prior to the finalization of the questionnaire.

Table 1. Constructs and measured variables

Constructs	Measured variables	Sources
Course Curriculum	Course contents	Sharma and Rani (2014), Yacoba et al. (2012), Breslow et al. (2013).
	Assignment, term paper, and presentation	
	Online class participation	
	Examination schedule and curriculum	
	Group discussion	
Internet Self-Efficacy	Internet facilities	Roach and Lemasters (2006), Wains and Mahmood (2008).
	Operating system	
	Suitable devices	
Learning Style	Specific problem-solving discussion	Bignoux and Sund (2008), Garrison et al. (2001), Adams et al. (2013).
	Learning materials distribution	
	User-friendly course delivery system	
Self-Motivation	Technical supportive	Wolters et al. (2005).
	Unique opportunities	
	Enjoy taking responsibilities for new projects	
	Feel good when students get positive feedback	
	Readily accept tasks	
Online Education	Understand the online course	Hartman et al. (2000), Consortium (2002), Duraku and Hoxha (2020), Breslow et al. (2013), Begum et al. (2024).
	Paper presentation	
	Students' attendance	
	Students' satisfaction	
	Sustainable education system	

4.3 Data Analysis

The SmartPLS software version 4.0 was used to evaluate the data received via surveys. A partial least squares structural equation modeling (PLS-SEM) approach was used to analyze survey results and validate the recommended theories. The study's conceptual model was tested using structural equation modeling (SEM). For sample distribution, frequency distribution and percentile metrics were predominantly used. The descriptive statistics analysis was tested using mean and standard deviation measurements. To test for multicollinearity among the independent variables, collinearity statistics were used. Furthermore, the reliability of the scale items was determined using Cronbach's alpha coefficient scores and composite reliability (CR). Similarly, discriminant validity was utilized to test the Fornell-Larcker Criterion among the independent and dependent variables. The capacity of exogenous constructs was often evaluated by the determination coefficient (R2).

5. Results and Analysis

5.1 Descriptive Analysis

All the determinants were usually analyzed using the scores of mean and standard deviation. The aspects were ranked based on their calculated mean values. As illustrated in Table 2, learning style generates the highest mean score (M= 4.190) whereas self-motivation has the lowest mean score (M= 4.048). All factors generated moderate mean scores except learning style and self-motivation. It recommended that there was higher variation between learning style and self-motivation rather than other aspects.

Table 2. Descriptive statistics analysis

Constructs	Mean	Std. Deviation	Rank
Course Curriculum	4.096	.705	4
Internet Self-Efficacy	4.110	.661	2
Learning Style	4.190	.605	1
Self-Motivation	4.048	.675	5
Online Education	4.103	.580	3

5.2 Multicollinearity Test

According to Hair et al. (2019), the predicted route coefficients can be altered if the exogenous constructs are significantly linked among themselves. Among many methodologies, variance inflation factor (VIF) and tolerance level are widely employed to assess any occurrence of multicollinearity. As advised by Hair et al. (2019), VIF should be less than 5 and tolerance should be more than above 0.10. As illustrated in Table 3, all VIF values and tolerance values did not cross the recommended threshold levels and thus, no such multicollinearity was there.

Table 3. Multicollinearity test

Constructs	Collinearity Statistics			
	Tolerance	VIF	Tolerance	VIF
Course Curriculum	.458	2.182	.464	2.157
Internet Self-Efficacy	.441	2.267	.473	2.116
Learning Style	.492	2.032	.520	1.924
Self-Motivation	.628	1.592	-	-

5.3 Measurement Model Analysis (Outer Model)

Hair et al. (2019) delineates that the "measurement model is a component of a theoretical path model that contains the indicators and their relationships with the constructs; also called the outer model in PLS-SEM." To check whether the items are loaded on their respective constructs, a confirmatory factor analysis (CFA) is used (Hair et al., 2019). For conducting structural equation modelling, SmartPLS software package version 4.0 had been used (Ringle et al., 2024).

Table 4. Measurement model summary

Construct	Items	Factor Loading	AVE	CR	Cronbach's α
Course Curriculum	CC1	0.788	0.626	0.893	0.851
	CC2	0.815			
	CC3	0.771			
	CC4	0.772			
	CC5	0.809			
Internet Self- Efficacy	ISEI	0.755	0.631	0.837	0.708
	ISE2	0.810			
	ISE3	0.817			
Learning Style	LS1	0.702	0.583	0.807	0.640
	LS2	0.811			
	LS3	0.773			
Self-Motivation	SM2	0.733	0.574	0.870	0.814
	SM2	0.797			
	SM3	0.814			
	SM4	0.744			
	SM5	0.694			
Online Education	OE1	0.739	0.531	0.850	0.779
	OE2	0.724			
	OE3	0.677			
	OE4	0.776			
	OE5	0.726			

5.3.1 Unidimensionality

Unidimensionality aspects of constructs indicate that each measurement item has an acceptable level of factor loading with the respective latent construct. As recommended by Hair et al. (2019), each construct should have measurement items with a minimum factor loading of 0.70. As illustrated in Table 4, all items have an acceptable except self-motivation (SM5), and online education (OE3). However, as self-motivation (SM5), and online education (OE3) are close to 0.70, the items have been retained. Thus, the unidimensionality of the measurement model has been established.

5.3.2 Construct Reliability Tests

Construct reliability indicates the reliability of the internal consistency of each latent construct. The alpha of Cronbach and composite reliability (CR) are among the most common approaches used to determine the construct's reliability. The recommended scores of reliability value are equal to or above 0.70 (Hair et al., 2019). Table 4 showed that all the CR and Cronbach's alpha values except learning style (0.640) fall within the acceptable level and thus, the constructs are reliable for further analyses.

5.3.3 Convergent Validity Tests

The values of the average variance extracted (AVE) above 0.50 (Hair et al., 2019) were used to explain the convergent validity of the latent construct. The AVE value of 0.50 or higher suggests that the latent factors account for around 50% or more of the variation in the observed items. All the AVE values were, accordingly, appropriate and therefore valid for further study, as shown in Table 4.

6.4 Discriminant Validity Tests

Discriminant validity ensures that no large inter construct correlation and cross-loading exist among the latent constructs. The square root of AVE and correlation coefficients among the constructs are compared to create discriminant validity (Hair et al., 2019). The square roots of AVE shown diagonally are greater than the inter-construct similarities shown off-diagonally, as seen in Table 5. Thus, the discriminant validity is obtained for the research constructs.

Table 5. Discriminant validity: Fornell-Larcker criterion

Constructs	Course Curriculum	Internet Self-Efficacy	Learning Style	Self-Motivation	Online Education
Course Curriculum	0.791				
Internet Self-Efficacy	0.683	0.794			
Learning Style	0.641	0.635	0.763		
Self-Motivation	0.506	0.560	0.545	0.758	
Online Education	0.667	0.635	0.719	0.668	0.729

Note: Diagonal elements are the square root of AVE and off-diagonal elements are correlations among constructs

6.5 Structural model analysis (Inner model)

After testing and validating the full measurement model, the structural model must be assessed (Hair et al., 2019). The decision regarding acceptance and rejection of the proposed hypotheses through significant and insignificant relationships can be determined by structural model analysis (Schumacker & Lomax, 2004). A bootstrapping procedure with a subsample of 5000 had been applied in this current study for estimation of the model (Ringle et al., 2024).

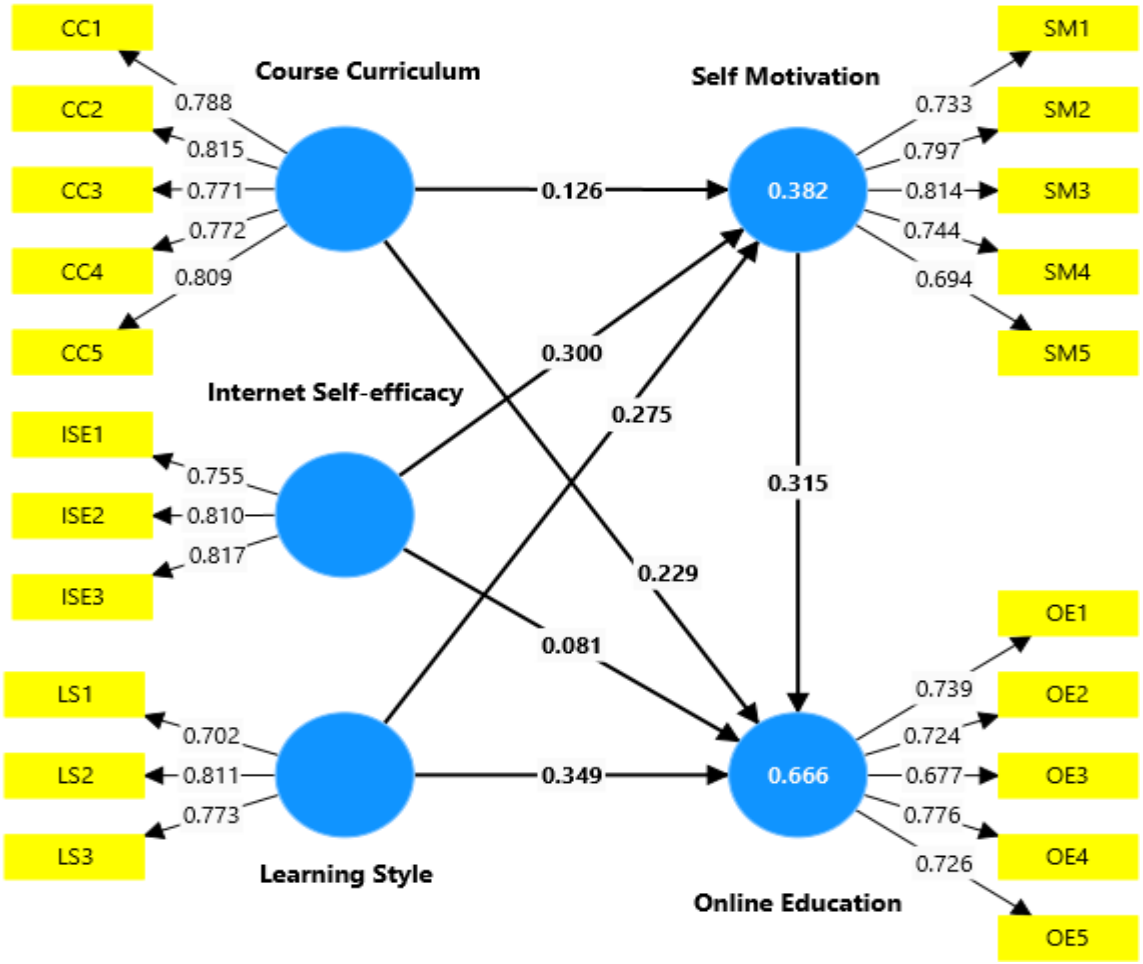

Figure 2. Structural model

Table 6A. Structural model estimates (direct effects)

Path	Coefficient (β)	T-values	P-values	Results
H1: Course Curriculum -> Online Education	0.229	2.596	0.009	Significant
H2: Course Curriculum -> Self-Motivation	0.126	0.838	0.402	Insignificant
H3: Internet Self-Efficacy -> Online Education	0.081	1.152	0.249	Insignificant
H4: Internet Self-Efficacy -> Self-Motivation	0.300	2.164	0.031	Significant
H5: Learning Style -> Online Education	0.349	5.385	0.000	Significant
H6: Learning Style -> Self-Motivation	0.275	2.770	0.006	Significant
H7: Self-Motivation -> Online Education	0.315	4.988	0.000	Significant

Note: p* < 0.05, based on the two-tailed test; t = 1.96.

6.5.1 Assessment of direct effects

The structural model analysis consists of the paths, path coefficients (β), t value, p values and results of the path coefficients. To test the formulated hypotheses, a two-tailed t-test was adopted where the level of significance was 5%. If the measured t-value is greater than the critical value of 1.96, the coefficients would be statistically significant. As illustrated in Table 6A and Figure 2, the results found that the path coefficients of three latent constructs including course curriculum, learning style, and self-motivation had a significant and positive impact on online education at p<0. 05, and the path coefficients of two latent constructs including internet self-efficacy, and learning style had a significant and positive impact on self-motivation at p<0. 05, Hypotheses H1, H4, H5, H6, and H7 were accepted. The largest path coefficient (β= 0.349) of self-motivation indicated that if the learning style is increased by one standard deviation unit, online education would possibly increase by 0.349 standard deviation unit provided that all other independent aspects remain unchanged.

6.5.2 Indirect effects (mediation)

As demonstrated Table 6B and Figure 2, the indirect effects show the mediating role of self-motivation. Results showed that self-motivation significantly mediated the relationship between one factor and online education. This factor was the learning style and thus, hypotheses H_{8c} was supported. As the direct effect of course curriculum, and learning style on online education at the higher secondary education level was also significant, self-motivation plays a partial mediation.

Table 6B. Structural model analysis (indirect effects*)*

Indirect effects	Path coefficients (β)	T Statistics	P Values	Results
H8a: Course Curriculum -> Self-Motivation -> Online Education	0.040	0.866	0.386	Insignificant
H8b: Internet Self-Efficacy -> Self-Motivation -> Online Education	0.095	1.863	0.063	Insignificant
H8c: Learning Style -> Self-Motivation -> Online Education	0.087	2.153	0.031	Significant

Note: $p^* < 0.05$, based on the two-tailed test; $t = 1.96$.

6. Conclusions and Implications

This research has examined the determinants that influence online education at the higher secondary level in Bangladesh, with a particular emphasis on the role of self-motivation as a mediator. The study identified crucial characteristics, including course content, internet self-efficacy, learning style, and self-motivation, and evaluated their influence on online learning experiences and results. The results of the PLS-SEM analysis revealed a substantial correlation between online education and course curriculum, learning style, and self-motivation. The results also indicated that self-motivation plays a crucial role in mediating the link between learning style and online education in the perspective of higher secondary level in Bangladesh. The findings enhance comprehension of the difficulties and possibilities relationship with establishing online education in a developing country, especially during circumstances that need remote learning, such as epidemic conditions.

The study demonstrates that the design of the course curriculum is a pivotal factor in determining the efficacy of online education. An effectively organized and captivating curriculum, specifically designed for online platforms, improves student involvement and academic achievements (Kebritchi et al., 2017). The research highlights the necessity for curriculum that can be easily adjusted for online forms and that include interactive and multimedia components to enhance comprehension and memory retention. Internet self-efficacy, which refers to the belief in one's capability to utilize the internet proficiently, has been identified as a crucial factor.

According to a study by Eastin and LaRose (2000), students who have a higher level of internet self-efficacy are able to traverse online learning platforms more effectively, participate more actively in online debates, and achieve better academic performance. This discovery emphasizes the significance of digital literacy programs in equipping students and instructors with the essential abilities to thrive in an online educational setting. The study also emphasized the impact of learning styles on the acceptance and efficacy of online education. Students with diverse learning styles derive advantages from employing a range of instructional techniques, including visual, aural, or kinesthetic activities. Online platforms provide the ability to meet these various needs, which can improve learning experiences if used effectively (Pashler et al., 2008). Self-motivation was found to play a crucial role in connecting these factors (course content and learning style) with the outcomes of online education. According to Deci and Ryan (2000), the study revealed that students who had an inherent motivation to learn were more inclined to overcome obstacles related to online learning, such as technological difficulties and feelings of isolation. Hence, it is crucial to cultivate self-motivation by creating supportive online learning environments and tailoring learning pathways to enhance student engagement and academic performance.

In the context of Bangladesh, the study's results suggest that online education has the potential to tackle educational disparities and increase accessibility. However, there are some obstacles that need to be overcome. These encompass the enhancement of technology infrastructure, the promotion of digital literacy, and the establishment of supportive policies and institutional frameworks (Amin, 2021). In order to make online education a feasible and efficient method of learning for higher secondary students, it is imperative for policymakers and educational stakeholders to work together and allocate resources towards these areas. This study offers significant insights into the key determinant of online education in Bangladesh, namely at the higher secondary level. The importance of a comprehensive approach that takes into account curriculum design, digital literacy, and fostering self-motivation in pupils is emphasized. These findings are essential for policymakers, educators, and academics who seek to improve the quality and availability of online education in Bangladesh and comparable situations. Further investigation should focus on examining these factors, particularly through longitudinal studies that can monitor the lasting effects of online education programs.

6.1 Implications

The implications of the outcomes for online education at higher secondary level in Bangladesh are as follows: Firstly, educators and curriculum designers should prioritize the development of online course materials that are captivating, pertinent, and in line with the specific requirements of students. An organized and carefully planned curriculum has the potential to increase students' interest and involvement, resulting in improved learning results. Secondly, an educational institution should offer training and resources to assist students in cultivating self-assurance when utilizing online platforms and digital tools. This can include a range of activities such as workshops, tutorials, and technical assistance aimed at enhancing students' internet self-efficacy, hence increasing their comfort and effectiveness in an online learning setting. Thirdly, online education platforms should provide a wide range of learning resources and techniques, including videos, readings, interactive quizzes, and discussion forums, in order to cater to different learning preferences and approaches. This adaptability can assist students in actively participating with the material in manners that align with their personal interests and areas of expertise. Fourthly, as self-motivation plays a role in connecting course curriculum, learning style, and success in online education, instructors should prioritize implementing tactics that boost students' inherent motivation. This may involve establishing explicit objectives, delivering frequent evaluations, and establishing a nurturing virtual community that fosters peer engagement and cooperation. Fifthly, the identification of pupils who may exhibit a lack of self-motivation or have difficulties with internet self-efficacy can assist educators in delivering focused interventions. These could encompass individualized guidance, supplementary materials, or motivating strategies to facilitate the success of these students in an online environment.

Finally, policymakers and educational institutions can utilize these discoveries to formulate effective policies and distribute resources to facilitate the advancement of online education. This encompasses allocating resources towards the development of digital infrastructure, providing comprehensive training for educators, and implementing activities aimed at facilitating the acquisition of essential skills for online learning by students. Continuous assessment and feedback systems can be utilized to evaluate the efficacy of online courses. This iterative enhancement method guarantees that the online education system stays adaptable to the requirements of students and the ever-changing educational benchmarks. To optimize the efficacy of online education and promote learning outcomes for higher secondary level students in Bangladesh, educators and institutions should focus on addressing these factors.

7. Limitations and Further Direction

This research is restricted to the higher secondary education level sector of Bangladesh, and hence the results may not be generalizable to other education areas. The data may not accurately reflect the opinions of the entire Bangladeshi students’ population due to the limited sample size. Additional study is recommended to enhance the generalizability of the sampling by increasing the sample size. The study discovered minimal effects of the independent variable. There could be additional determinants that might influence online education in the mediating role of self-motivation in the perspective of higher secondary education level in Bangladesh. These issues remain to be investigated in future studies.

References

Adams, A. A., Liyanagunawardena, T. R., Rassool, N., and Williams, S. (2013). Use of open educational resources in higher education. *British Journal of Educational Technology*, 44(5), E149–E150.

Akkoyunlu, B. (1995). Bilgi Teknolojilerinin Okullarda Kullanımı ve Ögretmenlerin Rolü', *Hacettepe Üniversitesi Egitim Fakültesi Dergisi*, 11(11), 105-109.

Alexander, P. A. (2006). *Psychology in learning and instruction*, Upper Saddle River, NJ: Pearson.

Alexander, P. A., and Murphy, P. K. (1998). *The research base for APA's learner-centered psychological principles*, In N.M. Lambert, & B.L. McCombs (Eds.). How students learn: Reforming schools through learner-centered education (pp. 25- 60). Washington D. C.: American Psychological Association.

Alrushiedat, N., & Olfman, L. (2014) 'Anchoring for self-efficacy and success: An anchored asynchronous online discussion case', Journal *of Information Systems Education*, 25(2), 107-116.

Ames, C., & Ames, R. (Eds.). (1985). *Research on motivation in education: The classroom milieu (Vol. 2)*, San Diego, CA: Academic Press.

Amin, M. R. (2021). Challenges and prospects of online education in Bangladesh: An analysis of the education sector's preparedness and adaptability. *Journal of Educational Technology*, 19(3), 125-138.

Anderson, T. (2004). *Theory and practice of online learning*. Athabasca University Press.

Anderson, T., & Dron, J. (2011). Three generations of distance education pedagogy. *International Review of Research in Open and Distributed Learning*, 12(3), 80-97.

Artino, A. R. (2007). Self-regulated learning in online education: A review of the empirical literature. *International Journal of Instructional Technology and Distance Learning*, 4(6), 3-18.

Artino, A. R. (2008). Motivational beliefs and perceptions of instructional quality: Predicting satisfaction with online training. *Journal of Computer Assisted Learning*, 24(3), 260-270.

BANBEIS (2019). *Bangladesh Educational Statistics*. Bangladesh Bureau of Educational Information and Statistics.

Bandura, A. (1997). *Self-Efficacy: The Exercise of Control*. New York: W.H. Freeman.

Bandura, A. (2002) 'Growing primacy of human agency in adaptation and change in the electronic era. European *Psychologist*, 7(1), 2–16. Doi: 10.1027//1016-9040.7.1.2.

Banna, J., Lin, M. F. G., Stewart, M., & Fialkowski, M. K. (2015). Interaction matters: Strategies to promote engaged learning in an online introductory nutrition course. *Journal of Online Learning and Teaching*, 11(2), 249-261.

Baran, E., Correia, A. P., & Thompson, A. (2011). Transforming online teaching practice: Critical analysis of the literature on the roles and competencies of online teachers. *Distance Education*, 32(3), 421-439.

Barbadian, C. (2000). Ögretim Stili Odaklı Ders Tasarımı Geliútirme. *Milli Egitim Dergisi*, 147, 61-63.

Basilaia, G., and Kvavadze, D. (2020). Transition to online education in schools during a SARS-CoV-2 coronavirus (Covid-19) pandemic in Georgia. *Pedagogical Research*, 5(4), 1-9.

Bates A.W. (Tony) (2019). *Guidelines for designing teaching and learning for a digital age, teaching in a Digital Age: 2nd Edition.*

Begum, S., Sarker, M.A.H., Hossain, A. and Khan, M.Y.H. (2024). Determining the efficacy level of online education in higher studies during COVID-19 pandemic: evidence from Bangladesh. *Int. J. Knowledge and Learning*, 17(5), 457–483.

Bell, P. D. (2007). Predictors of college student achievement in undergraduate asynchronous web-based courses. *Education*, 127(4), 523–533.

Bernstein B. (1975). On the Curriculum. London: Routledge.

Bignoux, S., and Sund, K. J. (2008). Tutoring executives online: What drives perceived quality? *Behaviour & Information Technology*, 37(7), 703–713.

Black, G. S., & Kassaye, W. W. (2014). Do students learning styles impact student outcomes in marketing classes? *Academy of Educational Leadership Journal*, 18(4), 149-162.

Bolhuis, S. (2003). Towards process-oriented teaching for self-directed lifelong learning: a multidimensional perspective', *Learning and Instruction*, 13(3), 327–47.

Breslow, L. B., Pritchard, D. E., DeBoer, J., Stump, G. S., Ho, A. D., and Seaton, D. T. (2013) . Studying learning in the worldwide classroom: Research into edX's first MOOC. *Research & Practice in Assessment,* 8, 13-25.

Chang, C. S., Liu, E., Sung, H. Y., Lin, C. H., Chen, N. S., & Cheng, S. S. (2014) 'Effects of online college student's Internet self-efficacy on learning motivation and performance', *Innovations in Education and Teaching International,* 51(4), 366-377. doi:10.1080/14703297.2013.771429.

Daradoumis, T.R., Bassi, F., Xhafa, and Caballé, S. (2014). A review of massive e-learning (MOOC) design, delivery, and assessment, In *Proc. 2013 Eighth International Conference on P2P, Parallel, Grid, Cloud, and Internet Computing*, pp. 208-213, IEEE, 2013, October.

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4), 227-268.

Dörnyei, Z. (2020). Innovations and Challenges in Language Learning Motivation. Routledge.

Dunn, R., & Dunn, K. (1993). Teaching Secondary Students Through Their Individual Learning Styles Practical Approaches For Grades 7-12. Boston: Ailyn and Bacon, USA:

Duraku, Z. H., & Hoxha, L. (2020). *The impact of COVID-19 on education and on the well-being of teachers, parents, and students: Challenges related to remote (online) learning and opportunities for advancing the qua*. https://www.researchgate.net/publication/341297812

Eastin, M. S., & LaRose, R. (2000). Internet self-efficacy and the psychology of the digital divide. *Journal of Computer-Mediated Communication*, 6(1), JCMC611.

Garrison, D. R., Anderson, T., and Archer, W. (2001). Critical thinking, cognitive presence, and computer conferencing in distance education. *American Journal of Distance Education*, 15(1), 7–23.

Gasevic, D., Kovanovic, V., Joksimovic, S., and Siemens, G. (2014). Where is research on massive open online courses headed? A data analysis of the MOOC Research Initiative, *The International Review of Research in Open and Distributed Learning*, 15(5), https://doi.org/10.19173/irrodl.v15i5.1954.

Glenda, C. R., and Dunn, K.K (2010). The Impact of Online Graduate Students' Motivation and Self-Regulation on Academic Procrastination. *Journal of interactive online learning*, 9(1).

Gregorc, A.F. (1979). Learning/teaching styles: Their nature and effects. In J. W. Keefe (Ed.), Student learning styles: Diagnosing and prescribing programs (pp. 19-26). Reston, VA: National Association of Secondary School Principals.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate data analysis: A global perspective*. Cengage Learning EMEA- United Kingdom.

Hara, N., and Kling, R. (1999). Students' frustrations with a web-based distance education course. *First Monday*, 4(12).

Hartnett, M. (2011). Examining motivation in online distance learning environments: Complex, multifaceted, and situation-dependent. *International Review of Research in Open and Distributed Learning*, 12(6), 20-38.

Hawk, T. F., & Shah, A. J. (2007). Using learning style instruments to enhance student learning. Decision Sciences *Journal of Innovative Education,* 5(1), 1-19.

Healey, M., Flint, A., and Harrington, K. (2014). *Engagement through Partnership: Students as Partners in Learning and Teaching in Higher Education*. Higher Education Academy, UK. https://www.heacademy.ac.uk/engagement-through-partnership-students-partners.

Hedge, T. (2001). Teaching and learning in the language classroom (Vol. 106). Oxford, England: Oxford

Hew, K. F., and Cheung, W. S. (2014). Students' and Instructors' Use of Massive Open Online Courses (MOOCs): Motivations and Challenges. *Educational Research Review*, 12, 45-58. http://dx.doi.org/10.1016/j.edurev.2014.05.001.

Hodges, C. B. (2008). Self-efficacy in the context of online learning environments. *Performance Improvement Quarterly*, 20, (3-4), 7-25. Doi: 10.1002/piq.20001.

Honey, M., Culp, K. M., and Carrigg, F. (2000). Perspectives on technology and education research: Lessons from the past and present. *Journal of Educational Computing Research*, 2(1), 5-14.

Hsieh, P., Jang, Y., Hwang, G. J., & Chen, N. S. (2011). Effects of teaching and learning styles on students' reflection levels for ubiquitous learning. *Computers & Education*, 57(1), 1194-1201.

Islam, M. S. (2020). Challenges and opportunities in online education during the COVID-19 pandemic: A Bangladeshi perspective. *Asian Education and Development Studies*, 10(2), 200-212.

Jenkins, D. M. (2015). Integrated course design: A facelift for college courses. *Journal of Management Education*, 39(3), 427-432.

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.

Kabir, M. H. (2020). The state of education in Bangladesh: An analysis of the secondary education sector. *Bangladesh Education Journal*, 18(2), 45-59.

Kebritchi, M., Lipschuetz, A., & Santiague, L. (2017). Issues and challenges for teaching successful online courses in higher education: A literature review. *Journal of Educational Technology Systems*, 46(1), 4-29.

Keefe, J. (1987) *Student Learning Styles and Brain Behavior*, NASSP, Reston, VA.

Keefe, J.W. (1979). Learning style: An overview. In J. W. Keefe (Ed.) Student learning styles: Diagnosing and prescribing programs (pp. 1-17). Reston, VA: National Association of Secondary School Principals.

Khan, M. M., Rahman, S. M. T. and Islam, S. T. A. (2021). Online Education System in Bangladesh during COVID-19 Pandemic. *Creative Education,* 12, 441-452.

Kyewski, E. & Krämer, N. C. (2018). To gamify or not to gamify? An experimental field study of the influence of badges on motivation, activity, and performance in an online learning course. *Computers & Education*, 118, 25-37.

Li, L. Y. & Tsai, C. C. (2017). Accessing online learning material: Quantitative behavior patterns and their effects on motivation and learning performance. *Computers & Education,* 114, 286-297.

Liaw, S. S. (2002). Understanding user perceptions of world-wide web environments. *Journal of Computer Assisted Learning,* 18(2), 137–148. doi: 10.1046/j.0266-4909.2001.00221.

Liaw, S.-S. (2008). Investigating students' perceived satisfaction, behavioral intention, and effectiveness of e-learning: A case study of the blackboard system. Computers *& Education,* 51(2), 864–873.

Lin, Y., Lin, G., & Lafey, J. M. (2008). Building a social and motivational framework for understanding satisfaction in online learning. *Journal of Educational Computing Research*, 38(1), 1–27.

Matthew S. Eastin, & Robert LaRose (2000). Internet Self-Efficacy and the Psychology of the Digital Divide. *The Journal of Computer-Mediated Communication*, 6(1).

Mayer, R. E. (2008). Applying the science of learning: Evidence-based principles for the design of multimedia instruction. *American Psychologist*, 63(8), 760-769.

Means, B., Toyama, Y., Murphy, R., Bakia, M., and Jones, K. (2009). *Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies,* U.S. Department of Education, Office of Planning, Evaluation and Policy Department, Policy and Program Studies Service.

Miah, M.R., Hossain, A., Shikder, R., Saha, T. and Neger, M. (2022). Evaluating the impact of social media on online shopping behavior during COVID-19 pandemic: A Bangladeshi consumers' perspectives. *Heliyon*, 8(9), e10600.

Nguyen, T. (2015). The effectiveness of online learning: Beyond no significant difference and future horizons. *MERLOT Journal of Online Learning and Teaching*, 11(2), 309–319.

Nicol, D. J., & Macfarlane-Dick, D. (2006). Formative assessment and self-regulated learning: A model and seven principles of good feedback practice. *Studies in Higher Education*, 31(2), 199-218.

Nygaard, C., and M. Serrano (2010) *Students' Identity Construction and Learning. Reasons for developing a learning-centred curriculum in higher educatio*n. In L. E. Kattington (Ed.), *Handbook of Curriculum Development*, Nova Publishers.

Pashler, H., McDaniel, M., Rohrer, D., & Bjork, R. (2008). Learning styles: Concepts and evidence. *Psychological Science in the Public Interest*, 9(3), 105-119.

Pintrich, P. R. (2004). A conceptual framework for assessing motivation and self-regulated learning in college students. *Educational Psychology Review*, 16(4), 385-407.

Pintrich, P. R., Marx, R. W., and Boyle, R. A. (1993) *Beyond cold conceptual change: The role of motivational beliefs and classroom contextual factors in the process of conceptual change, Review of Educational Research,* 63(2).

Ringle, C. M., Wende, S., and Becker, J.-M. 2024. "SmartPLS 4." Bönningstedt: SmartPLS, https://www.smartpls.com

Roach, V., and Lemasters, L. (2006). Satisfaction with online learning: A comparative descriptive study', *Journal of Interactive Online Learning*, 5(1), 317-332.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68-78.

Schumacker, R.E. and Lomax, R.G. (2004) *A beginner's guide to structural equation model (2nd ed.)*, Lawrence Erlbaum Associates, Mahwah.

Schunk, D. H., & Zimmerman, B. J. (2008). Motivation and self-regulated learning: Theory, research, and applications. *Lawrence Erlbaum Associates*.

Sharma, A., & Rani, R. (2014) *A 3-level model for implementing MOOC in India*, In Proc. 2014 IEEE International Conference on MOOC. Innovation, and Technology in Education (MITE), pp. 132-137, IEEE, 2014, December.

Tomlinson, C. A. (2001). *How to differentiate instruction in mixed-ability classrooms*. ASCD.

Tsai, M. J., & Tsai, C. C. (2003). Information searching strategies in web-based science learning: The role of Internet self-efficacy. *Innovations in Education and Teaching International*, 40(1), 43-50. doi: 10.1080/1355800032000038822.

Wains, S. I. and Waqar, M. (2008). *Integrating m-learning with e-learning. In Proceedings of the 9th ACM SIGITE conference on Information technology education (SIGITE '08)*, Association for Computing Machinery, New York, NY, USA, 31–38.

Wang, S. L., & Wu, P. P. (2008). The role of feedback and self-efficacy on web-based learning: The social cognitive perspective. *Computers & Education*, 51(4), 1589–1598.

Wolters, C. A., Pintrich, P. R., and Karabenick, S. A. (2005) Assessing academic self-regulated learning. In K. A. Moore and L. H. Lippman (Eds) 'What do children need to flourish? (pp. 251-270). New York: Springer.

Wooldridge, B. (1995). Increasing the effectiveness of university/college instruction: Integrating the results of learning style research into course design and delivery. In R. R. Simms and S. J. Simms (Eds.), the Importance of Learning Styles. Westport, CT: Greenwood Press, 49–67.

Yacoba, A., Kadirb, A.Z.A., Zainudinc, O., and Zurairah, A. (2012). Student awareness towards e-learning in education. *Procedia-Social and Behavioral Sciences*, 67, 93-101.

Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of Self-Regulation* (pp. 13-39). San Diego, CA: Academic Press.