

The Effect of Flipped Classroom and E-Learning on Student Behavior

Aesha Abdulla Mohammed Alnaqbi, Halizah Binti Awang

Faculty of Technical & Vocational Education university Tun Hussein Onn Malaysia

DOI: <https://dx.doi.org/10.47772/IJRISS.2025.909000556>

Received: 11 September 2025; Accepted: 17 September 2025; Published: 17 October 2025

ABSTRACT

The usage of different and innovated learning methods has shown significant results on the behavior of students all over the world. In the United Arab Emirates (UAE), students are facing difficulties in understanding the major topics and subjects with an added pressure of preparing for the exams. Hence, the aim of this study is to examine the relationships between e-learning, flipped classroom, and student behavior in primary schools of UAE. Quantitative methodology was applied to answer research questions and examine the hypothesized relationships and validate the proposed conceptual framework. Questionnaire was used to collect data from a sample of 800 students distributed in primary schools in UAE. Simple random sampling technique was applied in the survey procedure. SPSS and AMOS were utilized to conduct data analysis in this study. The results showed that e-learning and flipped classroom has a significant effect on student behavior. The outcome of this study contributes to the theory of self-determination theory in the educational context and provide novel evidence on the substantial role of innovation in the learning process in fostering the behavior of students, especially with the interaction of independent learning skills. Therefore, the leaders of schools in the UAE as well as policymakers the ministry of education should consider the findings of this study in developing strategic future plans to improve the learning process in the country.

Keywords: E-Learning, Flipped Classroom, Student Behavior

INTRODUCTION

By teaching students new, autonomous skills in a learning environment that assisted them in acquiring knowledge and complex scientific subjects through sampling techniques, the adoption of multiple learning strategies has transformed the educational process and significantly improved student behavior (Davronovich & Mansurjonovich, 2023). In addition to providing students greater choice over their education, the use of technology in the classroom, such as e-learning, has enabled teachers to impart knowledge in a more dynamic and captivating way (Linardatos & Apostolou, 2023). Due to their efficacy and the multiple documented effects, they have on students' academic performance, flipped classrooms and e-learning have become increasingly popular in educational institutions (Zhang, 2023). Students may now take control of their education thanks to these methods, which have made learning more personalized and interactive (Saputra, 2022). It is anticipated that these strategies will proliferate in educational institutions worldwide as technology develops. In terms of improving student behavior and independence, the flipped classroom approach has shown promising results (Goedhart et al., 2019). Nowadays, e-learning is a popular learning tool that supports conventional teaching methods. E-learning is just as crucial as flipped classrooms. Education researchers are now working to identify the elements that affect student behavior and to investigate the most effective teaching strategies that promote self-directed learning (Daily et al., 2019). Student behavior serves as a gauge for a student's progress or academic success in a particular topic or course. This could also be assessed through administering tests, exams, assignments, and even little projects, as well as student engagement, motivation (Andres, 2020), instructional practices, attitude (Tus, 2020), and the standard of teaching and learning resources accessible to them are all variables that may influence their achievement (Yang & Lee, 2021).

The UAE's educational systems need to address a variety of difficulties, even while the country's population is well educated and has high literacy rates, and the number of students enrolled in elementary and secondary

schools has increased in recent decades (IvyPanda, 2020). It is challenging to accomplish the ultimate aim of education in every school, which is taxonomically defined as the cognitive, psychomotor, and emotional domains (Tasrif et al., 2023). Several innovative teaching strategies, like the flipped classroom, which successfully uses technology to move lectures beyond the classroom while maintaining homework and concept-based exercises within the classroom through learning activities (Brunsell & Horejsi, 2011; Tucker, 2012), could help students develop their potential. The UAE is a leader in the adoption of cutting-edge educational ideas and new technical tools, making the mostly tech-dependent flipped classroom approach an appealing option. Teaching international standardized tests, like the recently redesigned SAT exam skills, in UAE schools, for instance, through flipped classroom instruction may help teachers cut down on lecture time and spend more time helping students develop their critical thinking and problem-solving abilities by working with their peers (Jarrah & Diab, 2019). The UAE improved their arithmetic score but dropped from 47th to 50th in the international rankings. It moved up two positions to 46th in reading and down from 46th to 49th in science. The UAE Ministry of Education declared that it aims to rank in the top 20 nations in terms of PISA results by 2021, when the next exam cycle is conducted (Daniel, 2019). The UAE's general course for the past ten years has been categorized as steady, according to the OECD's (2021) evaluation, but it has remained consistent throughout all three courses (reading, math, and science). The influence of e-learning on students' academic performance is still a major worry, despite the UAE having made significant progress in implementing e-learning applications. This is true despite several publications on the potential of e-learning for students of all ages. However, there is currently no information available on the UAE's flipped classroom participation and e-learning proficiency. In order to close these gaps, this study tried to understand how flipped classrooms and other multiple learning strategies may be the key to improving student behavior in UAE primary schools.

LITERATURE REVIEW

Flipped classroom

In recent years, the flipped classroom has gained popularity as a teaching method. Utilizing films or online resources, students are first exposed to new ideas and knowledge outside of the classroom (Tunggyshbay et al., 2023). The students are then ready to engage in discussions, problem-solving activities, and practical exercises in the classroom (Oudbier et al., 2022). This approach allows for more individualized and engaged learning experiences since professors can provide students with tailored help and support during class time (Doan et al., 2023). Students can take charge of their education and develop critical thinking and self-directed learning skills with the support of the flipped classroom paradigm (Galindo-Dominguez, 2021). By watching instructional videos or using online resources outside of class, students can learn at their own pace and review concepts as needed. Students can explore more resources and gain a deeper understanding of the subject thanks to this learning flexibility (Hew et al., 2021). The flipped classroom has drawn a lot of attention as a potential remedy for some of the issues with conventional teaching methods, so researchers studying educational settings should concentrate on it (Torres-Martn et al., 2022). Researchers in the field of education should focus more on the flipped classroom approach because it involves students interacting with instructional content outside of class, usually by watching videos or reading materials, and using class time for collaborative discussions and active learning activities (Ruiz-Jimenez et al., 2022; Turan, 2023). In terms of raising student engagement, improving conceptual knowledge, and cultivating critical thinking skills, the flipped classroom approach has shown promising results. Additionally, the flipped classroom model makes learning more personalized by letting students go at their own speed and revisit subjects as needed (Hoshang et al., 2021). By changing the emphasis from passive listening to active involvement, students can take charge of their learning and develop critical abilities like communication and problem-solving (Jia et al., 2022). Additionally, the flipped classroom approach can assist in meeting children's individual learning needs since it offers tailored support and differentiated instruction. According to Aydin and Demirer (2022), this learning methodology has the potential to transform education and equip students to meet the demands of the twenty-first century.

Since students are responsible for finishing pre-class assignments and showing up to class ready to participate in meaningful discussions, the flipped classroom paradigm obviously encourages student autonomy and self-

directed learning (Nugraheni et al., 2022). Students can now take charge of their education and cultivate critical and autonomous thinking thanks to this shift in accountability (Sointu et al., 2023). Put another way, the flipped classroom paradigm offers more individualized learning experiences since students can work at their own pace and review material as needed (Shen & Chang, 2023). This innovative method of instruction creates a more engaging and stimulating classroom environment where students can take an active role in their own learning journey (Sudarmaji et al., 2021). To sum up, it has been demonstrated that flipped classrooms significantly aid in the growth of self-directed learning abilities, which in turn improves student behavior. By replacing the traditional model of in-class lectures with recorded videos or online resources that students can access at home, the flipped classroom encourages students to take charge of their own learning. By encouraging students to study at their own pace, this method enables them to go over the material as many times as needed to fully understand the ideas. Students become more independent and gain the capacity to look for and learn information on their own as a result. This enhances their understanding of the material and fosters critical thinking and problem-solving abilities. All things considered, the flipped classroom strategy has proven to be very successful in raising student engagement, enhancing retention rates, and equipping students for challenges they may face in the real world.

Flipped classroom in UAE schools

The implementation of the flipped classroom model in the UAE has steadily increased over recent years, gaining popularity among educators and students due to its student-centred approach and emphasis on active engagement (Shana & Alwaely, 2020). This innovative instructional method has been shown to enhance critical thinking skills and deepen understanding across various subjects, from writing proficiency to mathematics and science (Farah, 2014; Jarrah et al., 2019; Shana & Alwaely, 2021). Studies have demonstrated significant improvements in student performance when the flipped classroom approach is applied, including better test scores, comprehension of scientific principles, and positive attitudes towards learning (Al-Derbashi, 2017; Alkaabi, 2022). Despite these positive outcomes, research on the impact of flipped classrooms on independent learning skills remains limited, particularly at primary and secondary education levels, with most studies focusing on tertiary or specialized programs. The UAE's diverse student population and focus on developing a knowledge-based economy make the flipped classroom especially valuable, as it accommodates different learning styles, fosters student autonomy, and encourages active engagement and collaboration. By allowing students to take ownership of their learning and providing opportunities to engage with content at their own pace, the flipped classroom supports critical thinking, problem-solving, and self-directed learning—skills essential for success in the 21st century. However, the current literature highlights gaps in large-scale empirical studies examining the development of independent learning skills within flipped classroom settings in the UAE, suggesting a need for further research to fully understand its impact on student behaviour and holistic learning outcomes (Al-Derbashi, 2017).

E-learning

The process of gaining information and skills using digital platforms and technology is referred to as e-learning, or electronic learning. To offer instructional information and support learning experiences, it makes use of computers, the internet, and a variety of multimedia technologies. Without the limitations of traditional classroom settings, e-learning allows anyone to access educational information and resources remotely, at their own pace and leisure. Students may learn at their own pace and from the comfort of their homes thanks to e-learning, which offers flexibility in terms of time and place. This is particularly helpful for those who might have other obligations, such family responsibilities or part-time employment (Ritonga et al., 2021). It is clear that e-learning has changed the manner that education is provided, removing barriers and increasing accessibility for learners from all backgrounds. Students are no longer limited by financial or geographic constraints because to the advancement of online learning platforms and resources (Kevin, 2023). They now have access to top-notch education from globally recognized universities, broadening their perspectives and creating a plethora of opportunities (Zhenchenko et al., 2021). This has leveled the playing field, giving pupils from rural or impoverished households the same educational opportunities as their wealthier classmates (Zandi et al., 2021). A student from a remote area with no access to educational resources, for instance, can now sign up for online courses provided by prestigious universities and get knowledge on par with that of students

enrolled on campus. This breaks the cycle of poverty and creates a fairer society by giving them the opportunity to pursue higher education and better career opportunities. E-learning in schools can offer a number of advantages. First of all, because students may access educational materials and resources at any time and from any location, it makes learning more flexible and accessible (Azizi et al., 2022). This allows students to study at their own pace and does away with the constraints of traditional classroom settings. Because digital platforms may adapt to the needs and interests of individual students, e-learning can provide a more customized learning experience by offering tailored material and flexible assessments. This customized approach can significantly increase student motivation and engagement, which will improve learning outcomes (Bada & Jita, 2021).

It has been said that e-learning eliminates geographical restrictions, allowing students who live far away or have physical disabilities to attend education. A more varied and inclusive learning environment results from this inclusion, which promotes equal opportunities for all students. Lastly, the traditional classroom environment is transformed by e-learning, which makes education dynamic and available to students worldwide (Khanahmadi & Nasiri, 2022). For instance, students have control over their learning path when they may access and study course materials at their own pace using an e-learning platform. They can review challenging concepts, move on to more complicated subjects, or even explore resources beyond the curriculum. Students benefit from this flexibility by taking charge of their education and developing the self-control, time management, and critical thinking skills needed to become self-directed learners (Murniati et al., 2022). Amer-Mestre et al. (2023) assert that e-learning fosters more cooperation amongst students from various geographic locations. Through online discussion forums and virtual group projects, student from all over the world may exchange ideas and learn from one another. This promotes cultural sensitivity and global citizenship while also expanding their knowledge and perspectives. Consequently, e-learning makes it easier to conduct ongoing evaluations and provide feedback, which enables students to track their progression and identify areas for improvement in real time. Students are helped to stay engaged and take charge of their learning process by this rapid feedback loop. The ability of e-learning to offer a dynamic and adaptable learning environment is among its most important advantages. E-learning platforms, in contrast to conventional classroom settings, may be customized to meet the needs and learning preferences of specific students (ALkhtaybeh, 2023). Students are empowered to take control of their education and tailor their learning experience to meet their unique requirements because to this flexibility. Additionally, e-learning systems usually have interactive elements like simulations, quizzes, and multimedia content, which improve the learning process and increase student engagement (Kesuma et al., 2023). In addition to making learning more enjoyable, these interactive elements help students comprehend and retain the material better. Given another way, e-learning systems usually offer real-time feedback and progress monitoring, enabling students to assess their own learning and identify areas that need more focus (Hamad et al., 2022).

To sum up, a review of the literature demonstrates that e-learning offers a variety of multimedia tools and resources that accommodate different learning preferences, increasing accessibility and inclusivity for all students (Kallas & Pedaste, 2022). By removing obstacles and providing equal opportunities for all students, regardless of their circumstances, e-learning has the potential to revolutionize education. Researchers have shown that e-learning platforms may significantly reduce costs associated with traditional classroom environments, including textbooks and physical infrastructure. This makes it possible for schools to invest in other educational initiatives, including teacher training or technological advancements, and manage resources more effectively (Purwantoro et al., 2021; Tangirov et al., 2021; El Omari et al., 2023). According to this study, e-learning enables students to study at their own speed and go over the content as much as needed, which helps them understand it better and improves their academic performance. Since students are often expected to do independent research and solve problems on their own, e-learning helps schools build a strong learning environment as well as long-term independent learning and critical thinking abilities. This makes the learning process more active and dynamic.

E-learning in UAE schools

The education system in the UAE faces several challenges, with language barriers being one of the most significant due to the country's diverse expatriate population, where English is not the first language for many

students, often hindering comprehension and academic performance (Ashour, 2020). Alongside this, the pressure of high academic expectations and standardised testing contributes to stress and anxiety, which further impacts students' success. To address these issues, schools are increasingly providing targeted support such as English as a Second Language (ESL) programs and counselling services, as well as implementing stress management workshops to promote student well-being (Zakarnah et al., 2020). Moreover, schools are working to create inclusive learning environments by offering cultural sensitivity training for staff, supporting students with special needs through individualised education plans, and partnering with mental health professionals to deliver counselling and wellness programs (Moussa & El Khalil, 2021). By integrating mental health education into the curriculum and fostering a culture of openness, schools are equipping students with resilience, emotional intelligence, and coping strategies for both academic and personal challenges (Goe et al., 2020). These holistic approaches not only enhance academic performance but also prepare students for lifelong success, as mental health awareness, counselling services, and mindfulness initiatives contribute to building a supportive and inclusive school culture. Ultimately, by prioritising student well-being and happiness, schools in the UAE are paving the way for a generation that is academically capable, emotionally resilient, and better prepared to thrive in an ever-changing world (Duyar & Aljanahi, 2023; Marquez et al., 2024).

Student behavior

Student behavior can be defined as the actions, reactions, and attitudes exhibited by students in various educational settings. This includes how students interact with their peers, teachers, and school staff, as well as how they approach their academic work and responsibilities. Understanding student behavior is crucial for creating a positive and productive learning environment, as it can affect overall classroom dynamics and academic outcomes. By observing and analyzing student behavior, educators can identify patterns, address issues, and implement strategies to support student success (Carroll et al., 2023). Educators can also use their knowledge of student behavior to tailor their teaching methods to better meet the needs of their students. By recognizing when a student is struggling or disengaged, teachers can provide additional support or adjust their approach to help the student succeed (Wettstein et al., 2023). Additionally, understanding student behavior can also help educators foster a sense of community and respect within the classroom, leading to a more cohesive and inclusive learning environment for all students. Ultimately, by actively addressing and managing student behavior, educators can create a positive and nurturing space where students can thrive and reach their full potential (Marlina et al., 2021).

Examples of student behavior that educators may encounter include disruptive behavior such as talking out of turn, not following directions, or being consistently late to class (Wangdi & Namgyel, 2022). Other examples could include passive behavior such as lack of participation, disinterest in the material, or refusal to complete assignments. Additionally, educators may observe aggressive behavior such as bullying, disrespect towards peers or teachers, or physical altercations. It is important for educators to address these behaviors promptly and effectively in order to maintain a positive and productive learning environment for all students. Ignoring these behaviors can lead to a decline in overall classroom morale and academic performance (Caldarella et al., 2021). By addressing disruptive, passive, and aggressive behaviors early on, educators can help students understand the importance of respect, cooperation, and responsibility. Implementing strategies such as positive reinforcement, clear expectations, and consistent consequences can help create a safe and conducive learning environment for all students to thrive (de Ruiter et al., 2020). Student behavior is important because it directly effects the overall classroom dynamic and learning experience for all students. When disruptive behaviors are left unchecked, it can create a domino effect that negatively affects not only the individual student but also their peers and the teacher. Additionally, addressing and shaping student behavior early on can help instill important social and emotional skills that are essential for success both inside and outside of the classroom (Zoromski et al., 2021). Through prioritizing positive behavior management strategies, educators can create a supportive and inclusive environment where all students feel valued and motivated to learn. By implementing clear expectations, consistent consequences, and positive reinforcement, teachers can effectively manage student behavior and create a positive learning environment. This proactive approach not only helps prevent disruptions but also fosters a sense of respect, responsibility, and cooperation among students (Herman et al., 2022). Ultimately, prioritizing positive behavior management strategies can lead to a more engaging and productive classroom where students can thrive academically and socially.

The Challenges of Education in the UAE:

One of the major challenges in the UAE education system is the language barrier, as many students come from diverse cultural and linguistic backgrounds, with English often not being their first language. This can hinder comprehension, learning, and overall academic performance (Ashour, 2020). In addition, high academic expectations and pressure to excel in standardised tests contribute to stress and anxiety, further affecting students' ability to perform well. To address these challenges, schools in the UAE are increasingly providing targeted support, such as English as a Second Language (ESL) programs, counselling services, and stress management workshops, to improve language skills and promote mental well-being (Zakarneh et al., 2020). Schools are also fostering inclusive learning environments through cultural sensitivity training for teachers and staff, as well as providing resources and accommodations for students with learning disabilities or special needs. Mental health and wellness programs play a central role in equipping students with resilience, emotional intelligence, and coping strategies, while partnerships with counsellors and mental health professionals offer additional support through workshops, individual and group counselling, and mindfulness training (Moussa & El Khalil, 2021; Goe et al., 2020). By prioritising both academic achievement and holistic development, UAE schools are cultivating emotionally resilient students who can navigate challenges effectively, take ownership of their learning, and thrive in both personal and professional life. Furthermore, by creating a culture of support, open communication, and destigmatisation of mental health issues, schools contribute not only to the success of individual students but also to the overall well-being and resilience of the community (Duyar & Aljanahi, 2023; Marquez et al., 2024).

Hypothesis Development

Flipped classroom and student behavior

Research has shown a positive correlation between the implementation of the flipped classroom model and improved student behavior (Nakkam, 2022; Hussain et al., 2023; Stackpool et al., 2023). Furthermore, teachers who have adopted the flipped classroom approach have reported higher levels of student engagement and participation in class discussions. This innovative teaching method allows students to engage with course material at their own pace, leading to a deeper understanding of the content and better retention of information. As a result, many educators are now considering incorporating elements of the flipped classroom model into their own teaching practices to enhance student learning outcomes. The adoption of the flipped classroom strategy can lead to pedagogical advancements, providing students with a more personalized and engaging learning experience (Hussain et al., 2023). In this teaching approach, students have the opportunity to engage with the content outside of the classroom, allowing for more personalized learning experiences (Belango, 2022). This approach also allows for more interactive and collaborative activities during class time, fostering a deeper understanding of the material through discussions and group work. By flipping the traditional classroom model, educators can cater to different learning styles and provide individualized support to students who may need extra help. Overall, the flipped classroom model has the potential to revolutionize the way students learn and absorb information, leading to improved academic performance and critical thinking skills. By watching pre-recorded lectures or completing readings at home, students can come to class with a solid understanding of the material, which facilitates deeper discussions and more hands-on activities (Zupanec et al., 2022). This approach also allows teachers to spend more time facilitating discussions, answering questions, and providing one-on-one support to students who may be struggling. Additionally, the flipped classroom model promotes student autonomy and self-directed learning, as students are encouraged to take ownership of their education outside of the traditional classroom setting. Ultimately, this innovative teaching method fosters a more engaging and interactive learning environment that can benefit students of all abilities and backgrounds. Overall, the flipped classroom model empowers students to attain remarkable academic achievement and outstanding performance. Based on this assumption, as well as the findings in the literature and reported evidence from the previous studies, the following hypothesis statement will be test in UAE primary school.

Hypothesis (H1): "Flipped classroom has a significant effect on student behavior"

E-learning and student behavior

Several studies have shown a positive correlation between e-learning and student behavior (Tawafak et al., 2023). For example, a study by Smith and Boscak (2021) found that students who engaged in regular online learning activities tended to have higher grades compared to those who did not. Additionally, research by Johnson and Lee (2019) demonstrated that students who utilized e-learning platforms reported feeling more engaged and motivated in their coursework, leading to improved academic outcomes. Overall, these findings suggest that integrating e-learning into traditional education settings can have a beneficial effect on student behavior. With the flexibility and accessibility of e-learning platforms, students are able to engage in self-paced learning and revisit course materials as needed, which enhances their understanding and retention of content. Additionally, e-learning often employs interactive and multimedia elements that cater to different learning styles, increasing student engagement and motivation (Qiu et al., 2022). This personalized approach to learning can help students better grasp complex concepts and apply them in real-world scenarios. Moreover, the convenience of e-learning allows students to study at their own pace and in their own time, leading to increased motivation and confidence in their abilities. By harnessing the power of technology, educators can create a more dynamic and engaging learning environment that fosters student success and academic achievement. As a result, students who participate in e-learning tend to demonstrate better academic performance and higher grades compared to those who solely rely on traditional classroom instruction (Rasheed et al., 2022). Additionally, e-learning can also cater to different learning styles and preferences, making it easier for students to grasp and retain information. This personalized approach to education can lead to a deeper understanding of the subject matter and a higher level of mastery. Based on this assumption, as well as the findings in the literature and reported evidence from the previous studies, the following hypothesis statement will be test in UAE primary school. In other words, e-learning presents a comprehensive and effective alternative to traditional classroom instruction, benefiting students in various ways. To that end, e-learning represents a novel learning method that increases teaching flexibility and the availability of learning resources. Therefore, digital resources at the e-learning platform make strong effects on student success (Rakic et al., 2020).

Hypothesis (H2): "E-learning has a significant effect on student behavior"

RESEARCH METHODOLOGY

This study applied quantitative methods to analyze the relationships between e-learning, flipped classroom, and student behavior, and to validate the hypotheses. The population is the students in primary schools in the UAE. The data instrument is a self-administered questionnaire. The data collection has been conducted on a sample of 800 students. A simple random sampling technique has been applied in the survey procedure. SPSS software is deployed to conduct data analysis. Regression analysis is the principal approach used to conduct data analysis and test the hypothesis of this study. To ensure the validity and reliability of the research instrument, a pilot test was conducted with a subset of 50 students before the full-scale distribution. The internal consistency of the questionnaire was assessed using Cronbach's alpha, with values exceeding 0.70 across all constructs, indicating acceptable reliability. Construct validity was further confirmed which helped refine the measurement model and eliminate items with low factor loadings. This process ensured that the questionnaire accurately captured the constructs of e-learning, flipped classroom implementation, and student behavior. Ethical considerations were strictly observed during the data collection process. Informed consent was obtained from all participants and their guardians, in accordance with school policies and ethical research guidelines. Participation was entirely voluntary, and anonymity and confidentiality of the respondents were maintained throughout the study. Data were analyzed using descriptive statistics, correlation matrices, and multiple regression models to test both direct and mediating relationships.

RESULTS AND DISCUSSION

In the survey phase, the researcher has distributed questionnaires to a sample of students consists of 800 students in schools. Out of the 800 questionnaires distributed to the study sample, 715 completed questionnaires have been considered for data analysis. The demographic profiles include the statistics that

explain the characteristics of study sample. Hence, this section demonstrates the population dynamics by investigating the main demographic data such as age, gender, academic level, work experience of the students as shown in Table 3. With respect to gender, the number of females is higher than males in UAE schools, while those from cycle 3 are the highest number of students (66%). While those enrolled in general Stream model is the highest group (48%).

The results of data analysis reveal the findings that answer research questions of this study. Testing the hypotheses should answer the research questions by providing evidence on existence of effects and the strength of such effect. This analysis is conducted in several steps, starting with path analysis to assess the significance of direct relationships between e-learning, flipped classroom, independent learning skills, and Student behavior within the proposed framework. To that end, the unstandardized coefficients are used to validate and accept the hypotheses, while standardized coefficients (Beta) are used to measure the strength interrelationships between the variable. Reading the output data in Table 4 reveals the scale and significance of relationships between e-learning, flipped classroom with Student behavior.

Table 1: Standardized regression coefficients and significance of relationships

Hypothesis Statement	Directions of effects	Beta	C.R	Sig.	Result
H1: E-learning has a significant effect on student behavior.	E-learning → student behavior	0.41	6.09	0.00	Supported
H2: Flipped classroom has a significant effect on student behavior.	Flipped classroom → student behavior	0.28	4.21	0.00	Supported

To test the hypothesis, the p-value only tells how likely the data that have observed is to have occurred under the null hypothesis. If the p-value is below the threshold of significance (typically $p < 0.05$), then this study rejects the null hypothesis. In other words, the alternative hypothesis is true. To support the statements of hypotheses, the Critical Ration (C.R) is applied to evaluate the significance level of unstandardized regression coefficients (Hair et al., 2019). Two criteria are used to validate the hypotheses and fulfill research objectives: (1) if $C.R \geq 1.96$ for a specific relationship, then a hypothesis is accepted (i.e., $p < 0.05$), otherwise the hypothesis should be rejected, and (2) the estimate path coefficient for a relationship is significant at the 0.05 cut-off point.

To test the first hypothesis (H1) which states that “Flipped classroom has a significant effect on Student behavior” (Sig. = 0.00, $C.R = 4.21 \geq 1.96$). There have been numerous studies conducted to examine the impact of the flipped classroom model on Student behavior. One study found that students in a flipped classroom setting were able to engage more actively with the material and had higher levels of understanding compared to traditional classroom settings. Additionally, the flipped classroom model has been shown to increase student motivation and participation, leading to improved academic outcomes. Furthermore, students in flipped classrooms often have more opportunities for individualized instruction and support, which can also contribute to their overall success. In other words, the flipped classroom model has the potential to significantly enhance Student behavior and learning outcomes. By allowing students to learn at their own pace and review material as needed outside of class, the flipped classroom model empowers students to take control of their own learning. This approach also encourages students to take responsibility for their education and fosters a sense of independence and self-motivation. As a result, students are more likely to retain information and apply it in real-world situations, ultimately leading to a deeper understanding of the material. In conclusion, the flipped classroom model is a valuable tool for educators looking to enhance student engagement, motivation, and academic success.

To test the second hypothesis (H2) which states that “E-learning has a significant effect on Student behavior” (Sig. = 0.00, $C.R = 6.09 \geq 1.96$). This result shows that E-learning has become increasingly popular in recent years, with many educational institutions incorporating online learning platforms into their curriculum. The impact of e-learning on Student behavior has been a topic of much debate and research. Some studies suggest that e-learning can have a positive effect on Student behavior, as it allows for more personalized learning

experiences and greater flexibility in how and when students engage with course material. However, other research has shown that the effectiveness of e-learning depends on various factors, such as the quality of the content, the level of engagement from students, and the support provided by instructors. Ultimately, the success of e-learning in improving Student behavior may vary depending on how well it is implemented and supported. Schools and educators must ensure that online learning platforms are used effectively, with engaging and high-quality content, active student participation, and regular support and feedback from instructors. By addressing these factors, e-learning has the potential to enhance student learning outcomes and provide a valuable supplement to traditional classroom instruction. It is clear that the future of education will likely involve a combination of in-person and online learning, making it essential for schools to continue exploring and refining their use of e-learning platforms.

Limitations of the study

This study is limited to the empirical examination of technology and innovative approaches to fostering students' learning skills. While the research has answered the main questions and provided several theoretical contributions, repeating the same design with similar goals in different countries would enhance the body of knowledge and offer stronger evidence to generalise the proposed relations. The interception of independent learning skills in the relationship between e-learning and flipped classrooms towards student behaviour is particularly significant, and further work is required to explain this logical connection. Moreover, the proposed model could be integrated and examined across other countries to increase its explanatory power and applicability. Finally, one of the main constraints of this study is the limited time available to extend the research to a broader population, which restricts the generalisability of the findings.

CONCLUSIONS

This paper underscores the crucial role of innovative teaching methods—specifically e-learning and flipped classroom models—in positively shaping student behavior within primary schools in the UAE. The empirical findings demonstrate that both e-learning and flipped classrooms have a significant direct impact on student behavior. These results align with and extend the self-determination theory by illustrating how autonomy-supportive environments, fostered through modern educational practices, enhance students' motivation, engagement, and positive behavioral outcomes. The study offers practical implications for school leaders, educators, and policymakers. The Ministry of Education and school administrations should consider embedding e-learning tools and flipped classroom techniques more deeply into the curriculum, while simultaneously focusing on building students' independent learning abilities through structured programs and teacher training. Such strategic integration can help address existing challenges in student engagement and exam preparedness, creating a more resilient, adaptable, and self-directed generation of learners. Future research could explore these relationships longitudinally or extend the model to secondary and higher education to build a more comprehensive understanding of how innovative education shapes student outcomes over time.

RECOMMENDATIONS

Based on the significant findings, this study highlights that e-learning and flipped classrooms directly and indirectly influence student behaviour through the mediating role of independent learning skills. Therefore, several recommendations are suggested for school principals in the UAE to create a more conducive environment for leveraging these models. First, schools should promote and integrate e-learning and flipped classroom approaches by investing in continuous professional development for teachers and incorporating these strategies into the curriculum to foster blended learning and student engagement. Second, principals are encouraged to strengthen students' independent learning skills by implementing targeted skill development programs, ensuring access to diverse learning resources, and establishing mentorship initiatives to provide guidance and support. Third, fostering a supportive learning environment is essential through collaborative classroom designs, parental involvement, and effective feedback mechanisms that engage all stakeholders in the learning process. Fourth, the implementation of these models should be monitored and evaluated through data-driven decision-making, regular assessments, and the use of pilot programs before large-scale adoption to

ensure effectiveness and sustainability. Additionally, schools should cultivate a culture of innovation by encouraging experimentation, sharing best practices, and recognising achievements to motivate both teachers and students. Finally, addressing potential challenges such as ensuring equity and access to digital resources and adapting strategies based on evolving needs will be crucial for successful implementation. Collectively, these recommendations provide a comprehensive framework for principals to enhance student behaviour, promote independent learning, and ultimately strengthen educational outcomes in the UAE.

REFERENCES

1. Al-Derbashi, K. (2017). The effect of the flipped classroom strategy on eleventh grade students' understanding of physics and their attitudes towards physics in Tonnb Secondary School in the UAE. *Journal of Education and Practice*, 8(29), 102-105.
2. Alkaabi, K. (2022). Applying the Innovative Approach of Employing a Business Simulation Game and Prototype Developing Platform in an Online Flipped Classroom of an Entrepreneurial Summer Course: A Case Study of UAEU. *Education Sciences*, 13(1), 13.
3. ALkhtaybeh, M. M. (2023). Effectiveness and Difficulties of E-Learning as Viewed by The Secondary Stage Students During COVID-19 Pandemic in Jordan. *Pegem Journal of Education and Instruction*, 14(1), 339-347.
4. Amer-Mestre, J., Ayarza-Astigarraga, A., & Lopes, M. C. (2023). E-learning engagement gap during school closures: differences by academic performance. *Applied Economics*, 1-23.
5. Andres, H. (2020). The role of active teaching, academic self-efficacy, and learning behaviors in student performance. *Journal of International Education in Business*, 13(2), 221-238.
6. Ashour, S. (2020). Quality higher education is the foundation of a knowledge society: where does the UAE stand?. *Quality in Higher Education*, 26(2), 209-223.
7. Aydin, B., & Demirer, V. (2022). Are flipped classrooms less stressful and more successful? An experimental study on college students. *International Journal of Educational Technology in Higher Education*, 19(1), 55.
8. Azizi, Z., Rezai, A., Namaziandost, E., & Tilwani, S. A. (2022). The Role of Computer Self-Efficacy in High School Students' E-Learning Anxiety: A Mixed-Methods Study. *Contemporary Educational Technology*, 14(2).
9. Bada, A. A., & Jita, L. C. (2021). E-learning Facilities for teaching secondary school physics: awareness, availability and utilization. *Research in Social Sciences and Technology*, 6(3), 227-241.
10. Belango, M. A. (2022). Cogency of flipped classroom on students' performance in mathematics in the modern world. *JETT*, 13(1), 149-155.
11. Brunsell, E., & Horejsi, M. (2011). Flipping your classroom. *Science Teacher*, 78(2): 10. Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. 2nd ed. Ed.: Lawrence Earlbaum Associates: Hillsdale, NJ
12. Caldarella, P., Larsen, R. A., Williams, L., Wills, H. P., & Wehby, J. H. (2021). "Stop doing that!": Effects of teacher reprimands on student disruptive behavior and engagement. *Journal of Positive Behavior Interventions*, 23(3), 163-173.
13. Carroll, M., Baulier, K., Cooper, C., Bettini, E., & Greif Green, J. (2023). US middle and high school teacher attributions of externalizing student behavior. *Behavioral Disorders*, 48(4), 243-254.
14. Daily, S. M., Mann, M. J., Kristjansson, A. L., Smith, M. L., & Zullig, K. J. (2019). School climate and academic achievement in middle and high school students. *Journal of school health*, 89(3), 173-180.
15. Daniel, S. (2019). UAE schools improve in Maths but lag behind in reading and science, international rankings show. *The National News*. <https://www.thenationalnews.com/uae/education/uae-schools-improve-in-maths-but-lag-behind-in-reading-and-science-international-rankings-show-1.946165>
16. Davronovich, A. D., & Mansurjonovich, J. M. (2023). Important advantages of organizing the educational process in a digital technology environment. *Galaxy International Interdisciplinary Research Journal*, 11(2), 149-154.
17. de Ruiter, J. A., Poorthuis, A. M., Aldrup, K., & Koomen, H. M. (2020). Teachers' emotional experiences in response to daily events with individual students varying in perceived past disruptive behavior. *Journal of School Psychology*, 82, 85-102.
18. Doan, S., & Berdie, L. (2023). Teachers' Preparation Experiences from Coursework to the Classroom.

19. Duyar, I., & Aljanahi, M. (2023). Examining the Influence of Principal Positive Leadership and Sense of Humor on Teachers' Wellbeing in UAE Public Schools. *Leadership and Policy in Schools*, 1-23.
20. El Omari, H., Chlouchi, K., Talbi, F. Z., Benboubker, M., Alaoui, M. M., Lahouiti, K., & Lalami, A. E. O. (2023). E-learning experience during COVID-19 pandemic management: Perception of secondary schools' teachers' in Morocco. *Scientific African*, 19, e01536.
21. Farah, M. (2014). The effect of using flipped classroom instruction on the writing performance of twelfth grade female Emirati students in the applied technology high school (ATHS) (Doctoral dissertation, The British University in Dubai (BUiD)).
22. Galindo-Dominguez, H. (2021). Flipped classroom in the educational system. *Educational Technology & Society*, 24(3), 44-60.
23. Goe, L., Alkaabi, A. K., & Tannenbaum, R. J. (2020). Listening to and supporting teachers in the United Arab Emirates: Promoting educational success for the nation. *ETS Research Report Series*, 2020(1), 1-18.
24. Goedhart, N.S., Blignaut-van Westrhenen, N., Moser, C. & Zweekhorst, M.B.M. (2019). The flipped classroom: supporting a diverse group of students in their learning. *Learning Environments Research*, 22(2), 297-310.
25. Hamad, A. L., Abouelnaga, H. M., Metwally, A. B. M., ShoShan, H., & Moawad, N. F. (2022). The Importance of E-Learning to the Students and Teachers. *Journal of Language and Linguistic Studies*, 18(2), 952-968.
26. Herman, K. C., Reinke, W. M., Dong, N., & Bradshaw, C. P. (2022). Can effective classroom behavior management increase student achievement in middle school? Findings from a group randomized trial. *Journal of Educational Psychology*, 114(1), 144.
27. Hew, K. F., Bai, S., Dawson, P., & Lo, C. K. (2021). Meta-analyses of flipped classroom studies: A review of methodology. *Educational Research Review*, 33, 100393.
28. Hoshang, S., Hilal, T. A., & Hilal, H. A. (2021). Investigating the acceptance of flipped classroom and suggested recommendations. *Procedia Computer Science*, 184, 411-418.
29. Hussain, M. I., Preetha, R., Naik, M. S., Panaskar, H. C., & Das, A. M. (2023). Assessing the effectiveness of flipped classroom strategy on student performance. *Eur. Chem. Bull.* 12(8), 2883-2896.
30. IvyPanda. (2020, June 30). Educational Challenges in the UAE. <https://ivypanda.com/essays/educational-challenges-in-the-uae/>
31. Jarrah, A. M., & Diab, K. M. A. B. M. (2019). The Effect of Flipped Classroom Model on Students' Achievement in the New 2016 Scholastic Assessment Test Mathematics Skills. *Online Submission*, 5(3), 769-777.
32. Jia, C., Hew, K. F., Jiahui, D., & Liuyufeng, L. (2023). Towards a fully online flipped classroom model to support student learning outcomes and engagement: A 2-year design-based study. *The Internet and Higher Education*, 56, 100878.
33. Johnson, D. S., & Lee, K. R. (2022). Teacher Professional Development in the Digital Era. *Teacher Education Journal*, 30(1), 65-80.
34. Kallas, K., & Pedaste, M. (2022). How to Improve the Digital Competence for E-Learning? *Applied Sciences*, 12(13), 6582.
35. Kesuma, P. A., Kasmara, A., & Stevani, M. (2023). The Effectiveness of Edmodo as E-learning in English Learning Practice Discussion at Indonesia Senior High School. *Journal on Education*, 5(3), 7440-7447.
36. Kevin, S. (2023). Effect of E-Learning on the Academic Performance of Schools in Uganda. *International Journal of Online and Distance Learning*, 4(1), 12-22.
37. Khanahmadi, A., & Nasiri, S. (2022). The effect of flipped classroom approach on the Iranian high school EFL learners' performance. *Journal of Research in Techno-based Language Education*, 2(2), 49-61.
38. Linardatos, G., & Apostolou, D. (2023). Investigating high school students' perception about digital comics creation in the classroom. *Education and Information Technologies*, 1-23.
39. Marlina, E., Tjahjadi, B., & Ningsih, S. (2021). Factors affecting student performance in e-learning: A case study of higher educational institutions in Indonesia. *The Journal of Asian Finance, Economics and Business*, 8(4), 993-1001.

40. Marquez, J., Lambert, L., & Khanna, D. (2024). Exploring factors associated with student wellbeing in the United Arab Emirates: PISA 2018. *Journal of Research in International Education*, 23(1), 41-59.
41. Moussa, N. M., & El Khalil, N. S. (2021). Overview of Teachers' Mental Challenges, Competences, and Readiness to the Transition to Distance Learning in the UAE. *Psychological Science & Education*, 26(6).
42. Murniati, C. T., Hartono, H., & Nugroho, A. C. (2023). The challenges, supports, and strategies of self-directed learning among college students. *Journal of Education and Learning (EduLearn)*, 17(3), 365-373.
43. Nakkam, J. (2022). The Effect of the Flipped Classroom on Students' Performance in Grammar in Moroccan High Schools: A Mixed-Methods Approach. *Journal of Education in Muslim Societies*, 4(1), 20-35.
44. Nugraheni, B. I., Surjono, H. D., & Aji, G. P. (2022). How can flipped classroom develop critical thinking skills? A literature reviews. *International Journal of Information and Education Technology*, 12(1), 82-90.
45. OECD. (2021). Teaching in the United Arab Emirates: 10 Lessons from TALIS. Available on : https://www.oecd.org/education/talis/Teaching_in_the_UAE-10_Lessons_from_TALIS.pdf.
46. Oudbier, J., Spaai, G., Timmermans, K., & Boerboom, T. (2022). Enhancing the effectiveness of flipped classroom in health science education: a state-of-the-art review. *BMC medical education*, 22(1), 1-15.
47. Purwanto, A., Asari, S., & Maruf, N. (2021). The effectiveness of E-Learning madrasah in English teaching and learning. *Budapest International Research and Critics Institute (BIRCI-Journal): Humanities and Social Sciences*, 4(3), 5234-5244.
48. Qiu, F., Zhang, G., Sheng, X., Jiang, L., Zhu, L., Xiang, Q., ... & Chen, P. K. (2022). Predicting students' performance in e-learning using learning process and behaviour data. *Scientific Reports*, 12(1), 453.
49. Rakic, S., Tasic, N., Marjanovic, U., Softic, S., Lüftenegger, E., & Turcin, I. (2020). Student Performance on an E-Learning Platform: Mixed Method Approach. *International Journal of Emerging Technologies in Learning*, 15(2).
50. Rasheed, H. M. W., He, Y., Khalid, J., Khizar, H. M. U., & Sharif, S. (2022). The relationship between e-learning and academic performance of students. *Journal of Public Affairs*, 22(3), e2492.
51. Ritonga, A. W., Zulfida, S., Ritonga, M., Ardinal, E., & Susanti, D. (2021, June). The Use of E-learning as an Online Based Arabic Learning Media for Students. In *Journal of Physics: Conference Series* (Vol. 1933, No. 1, p. 012127). IOP Publishing.
52. Ruiz-Jimenez, M. C., Martinez-Jimenez, R., Liceran-Gutierrez, A., & Garcia-Marti, E. (2022). Students' attitude: Key to understanding the improvement of their academic RESULTS in a flipped classroom environment. *The International Journal of Management Education*, 20(2), 100635.
53. Saputra, R. (2022, December). The Developing of Simple e-Learning based on the Flipped Classroom with VBL and DGBL for Junior High School Student Learning EFL. In *Tarbiyah Suska Conference Series* (Vol. 1, No. 1, pp. 60-70).
54. Shana, Z., & Alwaely, S. (2021). Does the Flipped Classroom Boost Student Science Learning and Satisfaction? A Pilot Study from the UAE. *International Journal of Instruction*, 14(4), 607-626.
55. Shen, D., & Chang, C. S. (2023). Implementation of the flipped classroom approach for promoting college students' deeper learning. *Educational technology research and development*, 71(3), 1323-1347.
56. Smith, E., & Boscak, A. (2021). A virtual emergency: learning lessons from remote medical student education during the COVID-19 pandemic. *Emergency Radiology*, 28, 445-452.
57. Sointu, E., Hyypiä, M., Lambert, M. C., Hirsto, L., Saarelainen, M., & Valtonen, T. (2023). Preliminary evidence of key factors in successful flipping: predicting positive student experiences in flipped classrooms. *Higher Education*, 85(3), 503-520.
58. Stackpool, L., Galkande, I. P., & Leahy, D. (2023). Effect of a Flipped Classroom Teaching Approach on Improving Students' Performance. *The International Journal of Science, Mathematics and Technology Learning*, 30(2), 101.
59. Sudarmaji, I., Anwar, A. A. A., & Mulyana, A. (2021). Developing students' speaking skills through Flipped Classroom Model. *Journal of English Education and Teaching*, 5(2), 188-200.

60. Tangirov, K. E., Jomurodov, D. M., & Murodkasimova, S. K. (2021). The importance of e-learning and e-learning resources in individualized learning. *Asian Journal of Multidimensional Research (AJMR)*, 10(3), 464-469.
61. Tasrif, N., Ferdian, F., & Andres, F. S. (2023, January). Cognitive and Psychomotor on University Student Study Outcome in Apparel Basic Pattern Making Using CAD. In *Unima International Conference on Social Sciences and Humanities (UNICSSH 2022)* (pp. 149-155). Atlantis Press.
62. Tawafak, R. M., Alyoussef, I. Y., & Al-Rahmi, W. M. (2023). Essential Factors to Improve Student Performance Using an E-Learning Model: Review Study. *International Journal of Interactive Mobile Technologies*, 17(3).
63. Torres-Martín, C., Acal, C., El-Homrani, M., & Mingorance-Estrada, Á. C. (2022). Implementation of the flipped classroom and its longitudinal effect on improving academic performance. *Educational technology research and development*, 70(3), 909-929.
64. Tunggyshbay, M., Balta, N., & Admiraal, W. (2023). Flipped classroom strategies and innovative teaching approaches in physics education: A systematic review. *EURASIA Journal of Mathematics, Science and Technology Education*, 19(6), em2283.
65. Turan, Z. (2023). Evaluating whether flipped classrooms improve student learning in science education: A systematic review and meta-analysis. *Scandinavian Journal of Educational Research*, 67(1), 1-19.
66. Tus, J. (2020). The influence of study attitudes and study habits on the academic performance of the students. *IJARW| ISSN (O)-2582-1008* October, 2(4).
67. Wangdi, T., & Namgyel, S. (2022). Classroom to reduce student disruptive behavior: An action research. *Mextesol Journal*, 46(1), 1-11.
68. Wettstein, A., Jenni, G., Schneider, S., Kühne, F., Grosse Holtforth, M., & La Marca, R. (2023). Teachers' perception of aggressive student behavior through the lens of chronic worry and resignation, and its association with psychophysiological stress: An observational study. *Social psychology of education*, 26(4), 1181-1200.
69. Yang, Q., & Lee, Y. C. (2021). The critical factors of student performance in MOOCs for sustainable education: a case of Chinese universities. *Sustainability*, 13(14), 8089.
70. Zakarneh, B., Al-Ramahi, N., & Mahmoud, M. (2020). Challenges of teaching English language classes of slow and fast learners in the United Arab Emirates Universities. *International Journal of Higher Education*, 9(1), 256-269.
71. Zandi, G., Rhoma, A. A., & Ruhoma, A. (2023). Assessment of E-Learning Readiness in the Primary Education Sector in Libya: A Case of Yefren. *Journal of Information Technology Management*, 15(Special Issue), 153-165.
72. Zhang, T. (2023). Flipped Classroom and Student Readiness in Blended Learning. *International Journal of Education and Humanities*, 7(3), 161-163.
73. Zhenchenko, M., Melnyk, O., Prykhoda, Y., & Zhenchenko, I. (2022). Ukrainian E-Learning Platforms for Schools: Evaluation of Their Functionality. *International Review of Research in Open and Distributed Learning*, 23(2), 136-150.
74. Zoromski, A., Evans, S. W., Owens, J. S., Holdaway, A., & Royo Romero, A. S. (2021). Middle school teachers' perceptions and use of classroom management strategies and associations with student behavior. *Journal of Emotional and Behavioral Disorders*, 29(4), 199-212.
75. Zupanec, V., Vlastic, D., Pribicevic, T., & Lazarevic, T. (2022, June). The effect of the flipped classroom model on quality of the students 'performance in biology education in high school. In *Journal of Physics: Conference Series* (Vol. 2288, No. 1, p. 012015). IOP Publishing.