From Chalkboards to Digital Screens: How Classroom Technology Influences Student Academic Behavior, Engagement and Motivation

Dalle lavagne agli schermi digitali: In che modo la tecnologia in classe influenza il comportamento accademico, l'impegno e la motivazione degli studenti

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ABSTRACT

In the digital era, classrooms are integrating technology to support study, collaboration, organisation, engagement, and motivation. This quantitative, descriptive study examined how classroom technology relates to students' academic behaviour among Grade 10 students at a government high school in Khyber Pakhtunkhwa, Pakistan. Data were collected using a self-developed five-point Likert questionnaire and analysed in SPSS (means, standard deviations, chi-square tests, and correlation matrices). Participants reported that digital tools—including interactive whiteboards and online platforms—support personalised learning, real-time collaboration with teachers and peers, and the effective organisation of materials and deadlines. Respondents also indicated increased participation, motivation, and engagement. Overall, the findings suggest that technology-enabled personalised learning paths, collaboration tools, and interactive platforms are associated with improved study and organisational skills, and with more engaged academic behaviour.

Nell'era digitale, la didattica d'aula sta integrando la tecnologia a supporto di studio, collaborazione, organizzazione, partecipazione e motivazione. Questa ricerca quantitativa e descrittiva esamina il nesso tra tecnologia in classe e comportamento accademico degli studenti del decimo anno in una scuola superiore pubblica del Khyber Pakhtunkhwa, Pakistan. I dati sono stati raccolti con un questionario Likert a cinque opzioni sviluppato ad hoc e, successivamente, analizzati con SPSS (medie, deviazioni standard, test chi-quadrato e matrici di correlazione). I partecipanti hanno riferito che gli strumenti digitali (comprese lavagne interattive e piattaforme online) favoriscono l'apprendimento personalizzato, la collaborazione in tempo reale con i docenti e pari e l'organizzazione efficace di materiali e scadenze. Gli intervistati hanno inoltre indicato una maggiore partecipazione, motivazione e coinvolgimento. Nel complesso, i risultati suggeriscono che percorsi di apprendimento personalizzati resi possibili da tecnologia, strumenti di collaborazione e piattaforme interattive siano associati a migliori competenze di studio e organizzative e a maggiore coinvolgimento scolastico.

KEYWORDS
Digital Transformation, Classroom Technology, Students' Academic Behavior, Engagement, Motivation
Trasformazione digitale, tecnologia in classe, Comportamento scolastico degli Studenti, Impegno, Motivazione

Citation: Khan, S. A., Poletti, G. & Khan, F. N. (2025). From Chalkboards to Digital Screens: How Classroom Technology Influences Student Academic Behavior, Engagement and Motivation. *Formazione & insegnamento*, *23*(2), 104-114. https://doi.org/10.7346/-fei-XXIII-02-25_12

Conflicts of interest: The Author(s) declare(s) no conflicts of interest.
Authorship: Conceptualization (G. Poletti, S. A. Khan); Investigation (F. N. Khan, S. A. Khan); Methodology (S. A. Khan, F. N. Khan); Writing – original draft (S. A. Khan; G. Poletti); Writing – review & editing (G. Poletti & F. N. Khan).
Acknowledgments: We acknowledge the support provided by the students, teachers and school administration during the entire research pro-cess.

DOI: https://doi.org/10.7346/-fei-XXIII-02-25_12

Submitted: July 2, 2025 • **Accepted**: July 29, 2025 • **Published on-line**: September 10, 2025

Pensa MultiMedia: ISSN 2279-7505 (online)

1. Introduction

Traditionally, the main tools used in conventional classrooms were chalkboards and textbooks. Although they were effective in these days and these methods occasionally limited student engagement and participatory learning. It is crucial to look into their impact on such behavior since computing devices become more a part of educational procedures, in order to make technology complement but not kill the learning process. In the late twentieth century, overhead projectors and PowerPoint presentations introduced visual aids into classrooms that increased students' ability to digest and remember information (Mayer, 2009). Computers, tablets, and smartboards were introduced as part of the 21st century's digital revolution and are now considered essential tools in modern education. Zhao and Frank (2003) claim that technological developments in education have not only changed teaching approaches but also affected students' academic behavior, motivation, and engagement.

The development of classroom technology has had a significant impact on student academic behavior that influencing learning, engagement, and performance in educational environments. Technological improvements have continually modified the learning environment, from classic chalkboards to advanced digital screens. As society incorporates digital tools into many ways of life, education has shifted from teacher-centered instruction to a more participatory, student-centered learning method. This help students to enhance their study skill and provide personalized learning experiences (Selwyn et al., 2023). Interactive learning tools like, gamified platforms and digital educational app improve students study skills and retention (Sung et al., 2016). Cloud-based services and online libraries provide immediate access to large volumes of information, promoting autonomous study and critical thinking. Collaboration software like Google Classroom and Microsoft Teams enhance communication and collaboration, a necessity in contemporary learning environments (Wang, 2021). In addition, AI-powered tutors and analytics assist in monitoring improvement and comments exclusively for students to be able to alter their study approach effectively (Luckin et al., 2018).

Digitalization enhances the organizational skills of students by providing them with software like Google Drive and project management tools, which facilitate them to sort, store, and access information efficiently (Johnson, 2020). Computer calendars and reminders also facilitating in time management, allowing learners to monitor deadlines and schedule priorities accordingly (Schunk & Greene, 2018). Additionally, virtual platforms present autonomy and self-directed learning options, which stimulate intrinsic motivation and academic persistence (Miller, 2019).

The use of digital technology in the classroom has impacted the attention span of the students, retention of information, and academic achievement (Kay et al., 2018). Application of technology in education has changed the conventional classroom from chalkboards and textbooks to multimedia classrooms with computer screens, interactive software, and web platforms. Classroom technology has evolved extremely fast over the last decades, changing learning, interaction, and engagement between learners and educational content. This process has drawn considerable interest from scholars, educators, and politicians concerned with learning how technological innovations impact students' academic behavior. In this regard, academic behavior comprises several elements including student involvement in classroom activities, collaboration, motivation, engagement, and efficiency (Khan et al., 2023). Digital tools offer advantages like enhanced accessibility to learning resources; however, they also pose challenges, including digital distractions and inequalities in technological access (Dabbagh & Kitsantas, 2012).

Increased access to devices such as computers, interactive whiteboards, and tablets, and the development of learning software and web sites have promoted the transition from traditional to computer classrooms. These tools provide up new possibilities for personalized learning, collaboration, and information access that were previously unthinkable in the days of chalkboards. For example, while internet platforms provide real-time feedback and contact between students and teachers, digital screens allow teachers to show multimedia content that fits several learning styles. The broad acceptance of technology in classrooms, however, it has also raised concerns about prospective drawbacks including unequal access, diversions, and too much reliance on digital technologies (Warschauer, 2020).

According to Higgins et al. (2012), the study revealed that the incorporation of technology to increase the attractiveness and relevance of learning to the students' lives can increase participation. Gamification learning technologies and virtual simulations, for instance, have been used to increase students' engagement and concentration, especially in the field of STEM (Li & Tsai, 2013). On the other hand, scholars contend that excess dependence on tools of technology promotes low learning style as well as narrowed critical thinking as students overly on the use of technology while working out problems (Carr, 2022). Furthermore, the gap between technologically enriched students and those that do not utilize it continues to be of issue, in as much as it has the capability of increasing inequalities of education that already exist (van Dijk, 2020).

Contrasting the advantages and disadvantages of a shift from chalkboards to computer screens, this investigation enters the intricate tapestry of relationships between classroom technology and student academic behavior. Using a survey of the literature and empirical evidence, this argument strives to offer a concise summary of the effects of technology on important dimensions of student behavior such as engagement, motivation, and performance. In order to ensure that digital technologies are utilized to their maximum capacity to enhance student learning, it also stresses the importance of addressing barriers to effective technology integration, such as equitable access and teacher training.

1.1 Theoretical Background

The incorporation of technology into education is based on numerous learning theories that describe how digital classroom technologies influence student academic behavior. Constructivism is a significant idea that stresses how learners actively construct knowledge via their experiences and interactions (Piaget, 1970). Digital resources, such as interactive whiteboards and online platforms, support this notion by offering students hands-on, engaging learning experiences that promote exploration and collaboration (Jonassen, 1999). For example, gamified learning apps and virtual simulations enable students to investigate and solve problems in a dynamic setting, promoting deeper comprehension and critical thinking (Li & Tsai, 2013).

Another relevant theory is Social Constructivism, which emphasizes the role of social interaction in learning (Vygotsky, 1978). Classroom technology encourages collaboration with tools like discussion boards, shared papers, and video conferencing, allowing students to learn from their peers and teachers in real time (Warschauer, 2020). This social aspect of technology can increase student engagement and motivation by making them feel more connected to their learning community (Zheng et al., 2016).

In addition, illustrating how learners perceive and utilize digital tools is the Technology Acceptance Model (TAM) (Davis, 1989). TAM holds that technology adoption and effectiveness are a function of perceived ease of use and perceived usefulness. In the event that digital tools are perceived by students to be useful and easy to use, then they will likely use them, and this may boost their academic performance (Higgins et al., 2012). But technological problems or lack of training can impede this acceptance, which would cause disengagement (Selwyn, 2016).

At last, the Digital Divide Theory tackles the unequal access to technology among pupils, which can greatly influence academic conduct (van Dijk, 2020). Students from impoverished circumstances may not have access to gadgets or dependable internet, restricting their capacity to benefit from digital learning tools. This difference can worsen already existing achievement inequalities since individuals with better access typically score higher academically (Warschauer, 2020).

The growing adoption of digital technology in classrooms has disrupted traditional teaching techniques, but little is known about how these changes effect students' academic behavior, engagement, and motivation. Other research express concerns about distractions, short attention spans, and uneven access to technology, but others demonstrate increased engagement and tailored learning experiences. Drawing on these beliefs, this study intends to investigate how classroom technology influences student academic behavior, engagement and motivation.

1.2 Research Questions

RQ1. How does using digital tools like multimedia and online platforms affect student participation and interest in class compared to traditional methods?
RQ2. Does classroom technology improve student engagement, motivation and grades?
RQ3. How does unequal access to technology impact students' learning and performance based on their economic background?

2. Research Methodology

This paper aims to investigate how digital classroom technology influence students' academic behavior. The study intends to look into how digital transformation boosts students' academic behavior, engagement, and motivation. As a result, the study was quantitative and descriptive. According to Matthews and Ross (2010), researchers primarily use quantitative methods to collect structured data that can be represented numerically. Quantitative data is typically collected when a researcher takes a positivist epistemological approach to data collection and collects data that can be scientifically analyzed. Quantitative research is becoming common among academic analysts because of its growing importance. Quantitative research has significance in this modern world, when the internet, big data, and globalization are pervasive, because the scope and practices of scholastic research are constantly increasing and evolving. In educational research statistics, models, theories, and scientific data are used progressively to identify phenomena, explain change, analyze cause, and make policy statements. There are many data foundations for quantitative education research; however, the most popular are questionnaires, experiments, surveys, and publicly available historical data (Yue, 2019). For this research, the researcher administers a self-developed 5 Likert Scale questionnaire. Experts in pedagogy and technology-enhanced learning further validated the questionnaire items, eliminating certain items and incorporating new ones based on the expert feedback. The researcher himself collects the data from the respondents. A sample of 100 grade 10th students participated through simple random sampling techniques in this study. The data was analyzed using mean scores, standard deviation, chi-square tests, and linear regression techniques with the help of Statistical Package for the Social Sciences (SPSS).

3. Results and Analysis: component of students' academic behavior

3.1 Study Skill (Students' Academic Behavior)

Statement	*Mean*	*Std*	*Df*	*Chi Square*	*Sig*
Digital screens help me identify and summarize key points during lessons.	3.61	.909	4	322.561	.000
Online quizzes and interactive exercises have improved my retention of topics.	3.72	1.055	4	262.429	.000
Technology enables me to explore additional study materials beyond what is provided in class.	3.91	.748	4	252.730	.000
I am more confident in discussing topics after reviewing digital resources.	3.83	1.083	4	375.492	.000
Digital tools help me store and organize my notes efficiently.	3.83	1.082	4	452.857	.000
Digital learning tools have made it easier for me to track my academic progress.	3.59	.909	4	302.726	.000
Online resources reduce the need to carry multiple physical textbooks or notebooks.	3.61	.748	4	320.731	.000
Digital platforms reduce the chances of losing important documents or notes.	3.92	1.055	4	273.180	.000
Technology facilitates brainstorming ideas with classmates during group activities.	3.72	.945	4	325.123	.000
Digital tools make it easier to receive feedback from my peers in group work.	3.58	.921	4	331.150	.000

Table 1. Students' Study Skill.

Table 1 indicates the results and analysis of study skills. Most respondents, with a mean score of 3.61 and a standard deviation of .909, agreed that digital screens help us identify and summarize key lesson points. This will help us engage in our studies, give us personalized learning experiences, and empower us to take care of our own studies. In addition, with a mean score of 3.72 with a standard deviation of 1.055, the respondents agreed that online interactive activities and quizzes significantly boost knowledge retention by actively engaging students, providing immediate feedback, and reinforcing learning through active recall. These approaches transform passive learning into an engaging and inspiring experience that encourages deeper and longer-term learning opportunities about the topic and subject. Similarly, the respondents also agreed that technology offers a variety of supplemental study resources beyond conventional classroom materials, such as online libraries, educational applications, interactive simulations, virtual reality and augmented reality experiences, and multimedia resources. These tools improve learning by providing personalized experiences, flexible availability, and captivating formats. The mean score was 3.91, with a standard deviation of .748. Along the same lines, the respondents also agreed with a mean score of 3.83 and a standard deviation of 1.083 that we are more confident in discussing topics after reviewing digital resources with peers and teachers. For example, active participation, collaborative learning, and getting feedback on their comprehension are the main ways students acquire confidence when discussing issues with peers and teachers after reviewing digital resources. Through this process, students could improve their knowledge, express their thoughts, and enhance their communication skills, eventually boosting their confidence while participating in conversations. The mean score of 3.83 with a standard deviation of 1.082 shows that most respondents agreed that digital note-taking tools allow students to store and organize their notes more efficiently and effectively. With features such as searchability and accessibility, along with collaborative options, these tools enhance the overall learning experience. They also help students stay organized with functions like categorization, tagging, and manageable learning experiences. The participants in this study agreed with a mean score of 3.59 and a standard deviation of .909 that digital learning tools have made it much easier for me to keep an eye on my academic progress. These digital platforms also minimize the chances of losing important documents or notes. With features like personalized dashboards, progress reports, and interactive quizzes, tracking progress as a student has become a more straightforward task. Moreover, they provide centralized storage and cloud-based access, significantly reducing the risk of losing vital information, documents, and notes. In addition, the mean score 3.58 with a standard deviation .921 the respondents marked agreed that digital tools make it easier to receive feedback from my peers in group work and technology facilitates brainstorming ideas with classmates during group discussion and project activities. Online resources reduce the need to carry multiple physical textbooks or notebooks.

3.2 Organizational Skill as student academic behavior

Statement	*Mean*	*Std*	*df*	*Chi Square*	*Sig*
I use digital tools to track my progress in multiple subjects simultaneously.	3.59	1.156	4	352.409	.000
Organizing group projects has become easier with the help of shared digital platforms.	3.58	.945	4	276.157	.000
I feel a sense of accomplishment when I see my progress tracked digitally.	3.60	1.163	4	367.243	.000
Online leaderboards and rewards encourage me to perform better academically.	3.89	.994	4	324.760	.000
Digital storytelling or simulations make lessons more inspiring and relatable.	3.60	.910	4	275.876	.000
Technology allows me to find specific topics or materials quickly when revising.	3.88	.988	4	301.246	.000
Shared digital documents improve the clarity of roles in group projects.	3.91	.975	4	245.402	.000
Notifications from digital tools help me stay aware of assignment deadlines.	3.83	1.083	4	345.942	.000

Table 2. Organizational Skill (Students' Academic Behavior).

Table 2 shows us the organizational skill as component of student's academic behavior. Most respondents agreed with the mean score of 3.59 with a standard deviation of 1.156 and agreed that using digital tools helps them to track and handle their progress in multiple subjects. Digital tools provide students with various methods to monitor and manage their academic records across different subjects. From digital note-taking apps to online calendars that help with scheduling and educational platforms that offer personalized learning and progress tracking, these resources are invaluable. They aid in organization, enhance time management skills, and facilitate tailored learning experiences, leading to increased student engagement and improved academic behavior. Similarly, with a mean score of 3.58 with a standard deviation of .945, the respondents mentioned that managing group projects has become significantly easier due to the use of shared digital platforms. These platforms act as central resources for communication, task organization, and file sharing, simplifying the entire organization process. This efficient method clarifies project planning, reduces confusion, and enhances collaboration among students. Likewise, the participants recorded an average score of 3.60, with a standard deviation of 1.163, suggesting a widespread agreement on the feeling of achievement derived from tracking their progress digitally. The method of digitally tracking progress provides students with concrete evidence of their academic development and learning. This clarity significantly boosts motivation and engagement, as students can distinctly and quantifiably recognize their achievements. Such an organized strategy for monitoring progress can be a strong motivator, creating a fulfilling educational experience. Furthermore, students expressed their belief that the use of online leaderboards and reward systems enhances their academic performance, resulting in a mean score of 3.89 and a standard deviation of 0.994. These components, essential to gamified learning settings, promote higher academic success by creating a sense of competition, allowing for progress monitoring, and offering tangible rewards for achievements. The visual depiction of standings and progress motivates students to strive for higher scores, thus increasing their engagement and involvement while favorably impacting their academic behaviors. The data revealed a standard deviation of 0.988, with a mean score of 3.88, the participants expressed their view that digital storytelling and simulations enhance the inspirational quality and relatability of lessons. Furthermore, the integration of technology facilitates the prompt identification of specific topics or materials during the revision process. In the same line, participants agreed, with a mean score of 3.91 and a standard deviation of .975, that shared digital documents significantly enhance the clarity of roles in student group projects by offering a centralized and readily accessible repository for project-related information and progress tracking. This approach fosters transparency, mitigates ambiguity, and promotes improved communication among group members, contributing to a more organized and efficient collaborative process. Lastly, the respondents agreed with the statement that digital alerts from learning management systems and assignment tools serve as vital prompts for students, helping them keep on track with their academic duties by alerting them to upcoming assignment due dates. These prompt notifications play a significant role in encouraging efficient time management, reducing the chances of late submissions, and ensuring that critical academic deadlines are not missed. The mean score of this statement was 3.83, and the standard deviation was 1.083

3.3 Collaborative skill as a student academic behavior

Statement	*Mean*	*Std*	*Df*	*Chi Square*	*sig*
I feel more confident sharing my ideas during online group discussions.	3.83	1.083	4	289.347	.000
Technology reduces miscommunication during collaborative tasks.	3.59	1.156	4	292.370	.000
I use online platforms to keep in touch with group members outside the classroom.	3.88	.988	4	276.576	.000
Collaborating on shared documents helps me learn from others' perspectives.	3.62	.909	4	321.324	.000
Online collaboration tools save time compared to face-to-face group meetings.	3.92	.748	4	278.267	.000
Digital platforms encourage me to take more responsibility for my role in group work.	3.66	1.130	4	301.765	.000
Digital games and challenges in learning tools make me excited to learn.	3.90	.980	4	321.190	.000

Table 3. Collaborative Skill as Students' Academic Behavior.

Table 3 represents collaboration skills as a student's academic behavior. The mean score was 3.83, with a standard deviation of 1.083. The respondents agreed that we feel more confident while sharing our ideas during online group discussions to encourage active participation, create a supportive and inclusive environment, and provide structured opportunities for engagement. Technology can significantly reduce miscommunication during online collaborative tasks by offering tools that promote more transparent and efficient communication, including real-time collaboration platforms, instant messaging services, and visual supports. This strategy not only caters to different user preferences but also opens up opportunities for improving communication abilities; this statement's mean score and standard deviation were 3.59 and 1.156, respectively. In addition, the respondents agreed, with a mean score of 3.92 and a standard deviation of .748, that digital collaboration platforms provide considerable time savings over conventional in-person meetings by facilitating real-time communication, improving workflow efficiency, and enabling asynchronous teamwork. As a result, these tools allow teams to work on projects more effectively, regardless of their geographical location or differences in time zones. The participants were of the opinion that digital platforms encourage us to take more responsibility for our role in group work. Digital platforms also encourage increased accountability among students working on collaborative tasks by improving transparency, fostering clear communication, and enabling the tracking of individual contributions. The mean score was 3.66, and the standard deviation was 1.130. On the other hand, the students showed their interest. They agreed that digital games and challenges integrated into learning tools significantly boost student interest and participation by turning education into an interactive, enjoyable, and motivating journey. These resources utilize gamification strategies, such as points, badges, leaderboards, and engaging virtual simulations and quizzes, to engage students in their learning actively. This educational method fosters a sense of learner ownership, promotes exploration, and enables a more vibrant and tailored learning environment. The mean score was 3.90, and the standard deviation was .980.

3.4 Engagement in studies

Statements	*Mean*	*Std*	*Df*	*Chi Square*	*Sig*
I find it easier to review and revise assignments using digital tools.	3.59	1.156	4	345.249	.000
Technology has reduced confusion about homework expectations by offering quick access to clarifications.	3.58	.945	4	276.980	.000
The ability to collaborate online has enhanced the quality of my homework submissions.	3.88	.988	4	279.230	.000
I use online tools to gather information for homework more effectively.	3.61	.909	4	270.302	.000
Digital platforms have helped me learn to manage long-term homework projects better.	3.92	.748	4	238.643	.000
Interactive homework tasks, like online quizzes, keep me engaged with the subject material.	3.72	1.055	4	320.743	.000
I feel less stressed about homework when I have access to online resources for help.	3.91	.975	4	311.245	.000

Table 4. Engagement as a Students' academic behavior.

Table 4 presents the analysis of engagement with digital technologies. The mean score of 3.59 with a standard deviation of 1.156 shows that the respondents agreed it is easier to review and revise assignments using digital tools, such as note-taking apps, revision programs, and feedback systems. These tools offer numerous advantages for reviewing and revising assignments. These resources improve organizational effectiveness, encourage active participation, and enable easy access to suitable information, making the revision process more structured and efficient. Similarly, the participants also agreed with a mean score of 3.58 and a standard deviation of .945 that using technology, primarily through learning management systems (LMS) and online communication tools, has significantly reduced uncertainty about homework requirements. These platforms provide clear and easily accessible information related to tasks, due dates, and instructional support. In addition, they improve the interaction between teachers and students, creating opportunities for clarification and timely feedback. By effectively utilizing technological resources, teachers can create a more organized and supportive educational atmosphere for improving student performance in their homework activities. Most participants pointed out that the ability to collaborate online with peers and teachers enhanced the quality of their homework submissions, and this statement's mean score and standard deviation were 3.88 and .988, respectively. In addition, participants were also agreed with the mean score of 3.61 with standard deviation .909 that using digital tools and resources provide numerous benefits for academic tasks like assignments and research. They grant wider access to a vast range of information, include various formats, and provide immediate updates, which increases their effectiveness when compared to conventional methods. Additionally, these tools enable teamwork and support personalized learning experiences. Furthermore, the participants were agreed with a mean score of 3.72 and standard deviation 1.055 that Interactive homework tasks, including online quizzes, serve as a valuable resource for enhancing student engagement and facilitating effective learning outcomes. By actively involving learners in the educational process, these tasks not only make learning more enjoyable but also tailor the experience to individual needs, thereby markedly improving student understanding, retention, and motivation. Specifically, interactive homework assignments foster active participation, provide immediate feedback, and can be gamified to increase motivation. This methodology shifts students from being passive recipients of information to becoming collaborative participants in their learning journeys, ultimately leading to enhanced comprehension and long-term retention of material, the mean score of 3.91 with a standard deviation .975.

3.5 Motivation for academic success

Statements	*Mean*	*std*	*df*	*Chi Square*	*Sig*
I use digital tools to track my progress in multiple subjects simultaneously.	3.88	.988	4	319.903	.000
Organizing group projects has become easier with the help of shared digital platforms.	3.61	.909	4	330.540	.000
I feel a sense of accomplishment when I see my progress tracked digitally.	3.92	.748	4	273.230	.000
Online leaderboards and rewards encourage me to perform better academically.	3.72	1.055	4	342.902	.000
Digital storytelling or simulations make lessons more inspiring and relatable.	3.70	1.096	4	301.439	.000
Technology allows me to find specific topics or materials quickly when revising.	3.92	.981	4	274.942	.000
Shared digital documents improve the clarity of roles in group projects.	3.60	1.163	4	319.730	.000
Notifications from digital tools help me stay aware of assignment deadlines.	3.83	1.083	4	307.836	.000

Table 5. Motivation as a students' academic success.

Table 5 indicates students' motivation towards learning while using digital tools during the learning process. Most respondents agreed with the statement that digital tools aimed at enhancing academic success allow students to effectively oversee different subjects by providing unified platforms for handling assignments, tracking their progress, and accessing important resources. These tools often include digital calendars, task lists, and communication channels, which help students stay organized and efficiently manage their responsibilities across various subjects. The mean score and the standard deviation were 3.88 and .988, respectively. Additionally, with a mean score of 3.61 with a standard deviation of .909, the respondents agreed that arranging group projects and using collaborative digital platforms in educational environments greatly enhances student learning by fostering teamwork, improving communication, and building crucial skills. This method facilitates a more profound engagement with the subject matter. It promotes cooperation and allows students to implement their knowledge in real-world situations, which is essential for their future academic and career achievements. On the same line, the respondents also agreed that digital storytelling and simulations improve educational experiences by making them more captivating and per-

tinent. By utilizing interactive and immersive techniques, these methods create personalized narratives that engage students directly in learning. This level of active involvement encourages critical thinking and creativity, enhancing understanding and memory retention of information. For this statement, the mean score and standard deviation were 3.70 and 1.096, respectively. The respondents agreed, with a mean score of 3.92 and a standard deviation of 1.163, that digital libraries, online databases, and Massive Open Online Courses (MOOCs) offer students unparalleled access to various academic and research materials. Resources like e-books, peer-reviewed articles, scholarly journals, and multimedia components significantly improve understanding and retention of key concepts. Shared digital documents promote clarity and efficiency through real-time collaboration, centralized access, and organized version control. This setup allows multiple users to work on the same document simultaneously, creating an environment for instant feedback and continuous revisions, ultimately leading to a more polished and refined academic output.

3.6 Correlation of study skill with motivation to digital transformation

		Study Skill	*Motivation Skill*
Study Skill	Pearson Correlation	1	.806**
	Sig. (2-tailed)		.000
	N	100	100
Motivation Skill	Pearson Correlation	.806**	1
	Sig. (2-tailed)	.000	
	N	100	100

Table 6. Correlation of study skill with motivation to digital transformation.
****Correlation is significant at the 0.01 level (2-tailed).**

Table 6 indicate the correlation between students' study skill and motivation of students towards digital screen. The r value is .806 which is significant at .000 shows that motivation towards digital screens have a strong role in developing study skill of students.

3.7 Correlation of study skill with engagement to digital transformation

		Study Skill	*Engagement*
Study Skill	Pearson Correlation	1	.752**
	Sig. (2-tailed)		.000
	N	100	100
Engagement	Pearson Correlation	.752**	1
	Sig. (2-tailed)	.000	
	N	100	100

Table 7. Correlation of study skill with engagement to digital transformation.
****Correlation is significant at the 0.01 level (2-tailed).**

Table 7 shows the correlation between study skill and engagement towards digital transformation. The r value .752 which is significant at .000 indicates that there is a strong correlation between study skill and engagement towards digital transformation.

3.8 Correlation between organizational skill and motivation between digital transformation

		Organizational Skill	*Motivation*
Organizational Skill	Pearson Correlation	1	.808**
	Sig. (2-tailed)		.000
	N	100	100
Motivation	Pearson Correlation	.808**	1
	Sig. (2-tailed)	.000	
	N	100	100

Table 8. Correlation between organizational skill and motivation between digital transformation. **Correlation is significant at the 0.01 level (2-tailed).

Table 8 illustrate the correlation between organizational skill and motivation towards digital transformation. The r value .808 is significant at .000 indicate that there is a significant correlation between organizational skill and motivation towards digital transformation.

3.9 Correlation between organizational skill and engagement towards digital transformation

		Organizational Skill	*Engagement*
Organizational Skill	Pearson Correlation	1	.887**
	Sig. (2-tailed)		.000
	N	100	100
Engagement	Pearson Correlation	.887**	1
	Sig. (2-tailed)	.000	
	N	100	100

Table 9. Correlation between organizational skill and engagement towards digital transformation. **Correlation is significant at the 0.01 level (2-tailed).

Table 9 identify the correlation between organizational skill and engagement towards digital transformation. The r value .887 which is significant at .000 shows that there is a positive correlation between organizational skill and students' engagement towards digital transformation.

3.10 Correlation between collaborative skill and motivation towards digital transformation

		Collaborative Skill	*Motivation*
Collaborative Skill	Pearson Correlation	1	.963**
	Sig. (2-tailed)		.000
	N	100	100
Motivation	Pearson Correlation	.963**	1
	Sig. (2-tailed)	.000	
	N	100	100

Table 10. Correlation between collaborative skill and motivation towards digital transformation. **Correlation is significant at the 0.01 level (2-tailed).

Table 10 shows the correlation between collaborative skill and motivation towards digital transformation. The r value .693 which is significant at .000 show that there is significant correlation between students' collaborative skill with motivation towards digital transformation of classroom.

3.11 Correlation between collaborative skill and engagement towards digital transformation

		Collaborative Skill	*Engagement*
Collaborative Skill	Pearson Correlation	1	.911**
	Sig. (2-tailed)		.000
	N	100	100
Engagement	Pearson Correlation	.911**	1
	Sig. (2-tailed)	.000	
	N	100	100

Table 11. Correlation between collaborative skill and engagement towards digital transformation. **Correlation is significant at the 0.01 level (2-tailed).

Table 11 illustrate the correlation between collaborative skill of students and engagement towards digital transformation. The r value .911 which is significant at .000 shows that there is significant correlation between students' collaborative skill and engagement towards digital transformation of classroom.

4. Discussion

The research is focused on how classroom technology and digital transformation impact students' academic behavior engagement and motivation. The advancement of classroom technology from conventional chalkboards to interactive whiteboards and digital screens has significantly reshaped the educational experience. As educational institutions progressively incorporate digital resources into their learning environment, the impact of these tools on student academic achievement, involvement, and motivation has become a key topic in conversations about educational efficiency and equity. The finding of this research paper indicates that digital transformation enhances students' academic behavior, engagement and motivation through personalization experiences, adaptive technology, interactive instructional tools, cloud-based material, collaboration software, and AI-based instructors. These classroom technologies enhance communications, collaboration, critical thinking, engagement, and retention. The same findings have been reported by Selwyn (2020) that classroom technology has changed conventional learning environments to digital learning environments, with a drastic effect on student academic behavior. The change from teacher-centered to more student-centered, interactive teaching facilitates study skills and offers personalized experiences. In the same line, according to Warschauer, (2020) the transition to virtual from the traditional classroom has been made possible by the advent of digital technology, such as laptops, tablets, and interactive whiteboards, which offer access to information, collaboration, and differentiated instruction. Unfair access, diversification, and an over-reliance on digital technology are issues. On the other hand, Wang (2021), argued that collaboration tools, such as Microsoft Teams and Google Classroom, improve teamwork and communication, which are essential in today's classrooms. Additionally, students can effectively improve their study techniques with the aid of AI-driven instructors and analytics that track progress and offer tailored feedback (Luckin et al., 2018). Digital transformation enhances the organizational ability of students by providing tools such as Google Drive and task management software that enable proper planning, saving, and retrieval of information (Johnson, 2020). Students can efficiently manage time through monitoring due dates and prioritization via digital calendars and reminders (Schunk & Greene, 2018). Digital platforms provide autonomy and self-directed learning experiences, which enhance academic persistence and intrinsic motivation (Miller, 2019).

Classroom technology affects student behavior and their interaction with educational materials. Conventional learning settings typically promote a passive learning style, where students are supposed to listen attentively and take notes. Nevertheless, the introduction of laptops, tablets, and interactive software has transformed this approach toward active engagement. Students can now access multimedia content, perform real-time research, and collaborate via online platforms, enhancing their independence and accountability in their educational journey. On the other hand, this transition also presents challenges. For instance, for example, the disparity between students with access to technology and those without access remains a significant concern, (van Dijk, 2020). The advancement of technology has dramatically enhanced the possibilities for student involvement in education. Resources like smartboards, gamified educational platforms, and virtual simulations offer engaging and immersive learning opportunities. For example, learners can explore scientific principles through virtual laboratories or experience historical moments using

augmented reality applications. This form of engagement addresses various visual, auditory, and kinesthetic learning preferences, making education more accessible and engaging. In addition, technology promotes immediate feedback and customized learning experiences. Students can receive prompt reactions to assessments, access specially tailored materials, and monitor their progress, which keeps them actively engaged and committed to their educational path (Selwyn et al., 2023; Khan et al., 2023). Motivation is crucial in achieving academic success; classroom technology continuously fosters this evolution. Digital platforms frequently include gamification features like points, badges, and leaderboards, which engage students' intrinsic and extrinsic motivation. Moreover, the novelty and applicability of technology create a stronger connection to the real world, enhancing students' perception of the value of their education. Technology allows students to establish and track personal goals, reflect on their successes, and take pride in their advancements. Assistive technologies can eliminate obstacles for students with special needs or learning challenges, making education more inclusive and motivating (Warschauer, 2020). Technology has enormous potential and teachers play a crucial role in designing engaging digital experiences and educating students to use technology safely. To fully leverage the benefits of technology, educators must enhance their digital skills and engage in professional development. Furthermore, there is a serious issue with the digital divide. Educational gaps may worsen if deprived kids do not have access to reliable internet or modern technologies; the advantages of technology in education will be shared fairly, and these disparities must be fixed.

5. Conclusion

The aims of the study were to examine the role of digital transformation that influence students' academic behavior. After examining the statistical data, the analysis reports indicate that digital transformation have the significant role in developing students' academic behavior, engagement and motivation. Regarding study skill the participants were "agreed" on Likert scale that digital transformation and classroom technology influence study skill. Likewise, the respondents marked "agreed" on the Likert scale that students' motivation level is high towards digital transformation. Similarly, the respondents were also "agreed" that digital transformation improve organizational skill as academic behavior. In a parallel, the participants marked "agreed" on the Likert scale that digital transformation and classroom technology enhance collaborative skill. Similarly, the respondents marked "agreed" on the Likert scale that digital transformation and classroom technology influence engagement towards studies. So based on statistical data reports it is found that that most of the respondents marked "agreed" on the Likert scale that digital transformation and classroom technology influence students' academic behavior.

6. Ethical Considerations

The researcher followed ethical guidelines while conducting the study and reporting the results. The informed consent of the participant was requested, as well as the privacy and anonymity of the participant and the information.

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