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Article

Impact of Teaching beliefs and Efficacy, Teaching Outcomes Expectancy, Teaching Engagement on Student Engagement with the Mediating Role of Student Technology Use, and 21st Century Learning Attitudes of Public Sector Colleges in Iraq

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Abstract

This research intended to examine the effect of different factors toward learning engagement of students in the public sector colleges in Iraq. Namely, it sought to test the association between teaching beliefs and efficacy, teaching outcomes expectancy and teaching engagement with students' engagement, with the moderating effects of students' use of technology and their views toward 21-century learning. The sample used in this study was of 1298 teachers from the public sector colleges from Iraq. Statistical analysis carried out through the JASP software analysis technology. The research results of this study support the central moderating role of student technology use and learning attitudes in increasing the engagement level of students based on the teaching beliefs and efficacy multiplied by teaching outcomes expectancy and teaching engagement. These relationships have not investigated previously and therefore, this research enhances novel new knowledge to the body of information. In addition, practical implications and policies are presented with intends to improve the level of students' engagement in Iraqi colleges.

Keywords

Teaching Beliefs; Teaching Outcome; Teaching Engagement; Technology Use; Learning Attitude.

Abbreviations

TBE = Teaching Beliefs and Efficacy, TOE = Teaching Outcomes Expectancy, TE = Teaching Engagement, SE = Student Engagement, STU = Student Technology Use and LA = Learning Attitudes

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Educational institutions are fundamental to enhancing students' learning and performance within society (Wang, 2023). The continuous development of these institutions is crucial for improving student behaviour and performance. Motivated students tend to exhibit positive self-efficacy, which fosters their pursuit of educational goals and future success (Karagianni & Drigas, 2023). However, student engagement varies due to several influencing factors. Some students are highly goal-oriented, driven to achieve their objectives regardless of obstacles (Pham & Hanh, 2023). Such students are actively involved in their learning processes and performance. It recommended that students maintain a positive approach towards their performance, which closely linked to their engagement in classroom activities (Qureshi et al., 2023). Conversely, successful participation in various activities can enhance overall classroom performance (Liu et al., 2023). Thus, student engagement plays a crucial role in improving academic performance.

In Iraq, students enrol in a variety of programmes to gain general education and develop their skills (Ahmed et al., 2021). This skill development aims to equip them with effective approaches for logical and critical performance. However, in developing countries like Iraq, teachers often lack adequate training to support students effectively (Sulaiman et al., 2022). Improving student performance is essential, and it recommended that teachers adopt creative methods to enhance student engagement in classroom activities (Waham, Rahman, & Mustaffa, 2020). Creativity in supporting students' learning can significantly advance teaching performance (Hussein et al., 2020). Therefore, teachers play a critical role in improving students' overall performance, which has a lasting impact on their development and achievements (Qasim et al., 2021). Long-term engagement and support are positive factors for enhancing students' performance.

It advised that teachers should actively contribute to student engagement in classroom activities (Mashhadi, Al Suraifi, & Kadhum Fahad, 2022). This engagement is beneficial for improving students' learning and skills. College students, being at a higher level of education, are at a critical stage for enhancing their performance (Hellín et al., 2023). Motivation and academic performance shaped by students' active participation and performance. Therefore, fostering good relationships between students and teachers is essential, as mutual understanding can significantly boost students' performance (Qureshi et al., 2023). Some studies recommend that students should engage more with their teachers and classroom activities to enhance their skills and performance (Flavell, 2023). Additionally, Karabchuk and Roshchina (2023) suggest promoting logical understanding among students strategically improve their performance. Consequently, Pangsapa et al. (2023) emphasise the need for further research better understand the factors influencing student engagement.

This study aims to measure the impact of teaching beliefs and efficacy, teaching outcomes expectancy, and teaching engagement on student engagement, with a focus on the mediating roles of student technology use and 21st-century learning attitudes in public sector colleges in Iraq. A sample of 1,298 teachers from these colleges used for data collection, and the analysis conducted using the JASP statistical tool. The findings confirm that student technology use and learning attitudes play significant mediating roles between teaching beliefs and efficacy, teaching outcomes expectancy, teaching engagement, and student engagement. This study contributes novel insights to the literature, as these relationships have not previously tested. The research provides valuable practical implications and policy recommendations aimed at enhancing student engagement in Iraqi colleges. The study includes a review of literature, methodology, findings, discussion, and implications, with limitations and future directions discussed in the concluding section.

Review of Literature

The integration of technology in educational institutions is essential for enhancing student engagement and understanding (Pabba & Kumar, 2022). Technology aids students in interacting with classroom activities more effectively. When supported by teachers, students' classroom behaviours improve (Tulaskar & Turunen, 2022). However, insufficient engagement with technology can limit students' performance. In the modern era, which is increasingly technology-driven, it is crucial for students to adapt to technological changes (Salta et al., 2022). Teachers should support students in learning and using technology, and comprehensive training on technology-based classroom modules is necessary to improve students' technical skills (Buren, Maggin, & Kumm, 2022). Motivating students to engage with technology

is crucial for their performance and development (Veluvali & Surisetti, 2022). Therefore, the use of technology is highly recommended for its lasting impact on students' personalities and classroom performance (Alam & Mohanty, 2023).

H1: *Student Technology Use Mediates the Impact of Teaching Beliefs and Efficacy on Student Engagement.*

Teachers' outcome expectancy plays a vital role in student performance (Alismaiel, Cifuentes-Faura, & Al-Rahmi, 2022). Motivated students are more likely to advance their learning and address modern challenges effectively (Qureshi et al., 2023). The role of technology in engaging students is significant, and students should be encouraged to use technology to enhance their performance (Karabchuk & Roshchina, 2023). When teachers use technology to deliver course materials, students' behaviour and learning can improve (Pabba & Kumar, 2022). Higher motivation from teachers is necessary to engage students with technology in classroom activities (Hellín et al., 2023). Therefore, both teaching outcome expectancy and student technology use are crucial factors for enhancing student learning.

H2: *Student Technology Use Mediates the Impact of Teaching Outcome Expectancy on Student Engagement.*

Teachers' engagement with students is essential for providing guidance and support (Liu et al., 2023). The use of technology enables remote connections between teachers and students, improving understanding and performance. High motivation levels from students can lead to strategic improvements in their learning (Muthuswamy, 2023; Umar & Ko, 2022). Technology plays a critical role in engaging both students and teachers. When students are motivated to use technology, their engagement with teachers also improves (Elkhouli, 2022; Qureshi et al., 2023). Effective guidance from teachers enhances student outcomes, and their active role significantly affects student performance (Salta et al., 2022). Teachers must maintain high levels of engagement positively influence student performance (Ryan & Aasetre, 2021). However, limited student engagement may affect teachers' performance.

H3: *Student Technology Use Mediates the Impact of Teaching Engagement on Student Engagement.*

Students' attitudes significantly affect their learning (Alqasa & Afaneh, 2022; Wang, 2023). Positive attitudes towards performance lead to higher engagement and better outcomes (Jia et al., 2022). In contrast, students with lower motivation face challenges in their learning. The role of teachers remains critical in improving students' learning (Tulaskar & Turunen, 2022; Van Hoa et al., 2022). Teachers and parents support students' critical performance. It is further aiding their cognitive and learning development (Alam & Mohanty, 2023). Limited student engagement is insufficient for improving performance, thus requiring teachers to play an active role in advancing students' learning (Ahshan, 2021; Srithep et al., 2022). Active involvement with teachers has a lasting impact on student performance.

H4: *Learning Attitude Mediates the Impact of Teaching Beliefs and Efficacy on Student Engagement.*

Students exhibit varying approaches to interacting with teachers and handling their studies (Korkealehto, Lakkala, & Toom, 2021). Positive attitudes result in active involvement in classroom activities, while less motivated students may not receive adequate support from teachers (Buren et al., 2022). Motivation is a critical factor influencing student engagement and performance (Abdulhadi & Dashtbayaz, 2023; Karagianni & Drigas, 2023). Students' engagement and learning shaped by their attitudes, which are crucial for long-term performance improvement (Chiu, 2022). Therefore, supporting students' learning through their attitudes is essential for enhancing their overall performance and engagement (Li & Rohayati, 2023; Pham & Hanh, 2023).

H5: *Learning Attitude Mediates the Impact of Teaching Outcome Expectancy on Student Engagement.*

Teachers are responsible for benefiting students and enhancing their learning (Jia et al., 2022). When teachers are motivated, it positively affects their performance and student outcomes (Hellín et al., 2023). Over time, students' learning attitudes change, affecting their engagement (Umar & Ko, 2022). Teachers play a crucial role in advancing students' learning and performance, and attention to student engagement is significant for achieving educational goals (Alismaiel et al., 2022; Wei, 2023). Students with a positive learning attitude, supported by their teachers, tend to perform better compared to those with limited attitudes.

H6: *Learning Attitude Mediates the Impact of Teaching Engagement on Student Engagement.*

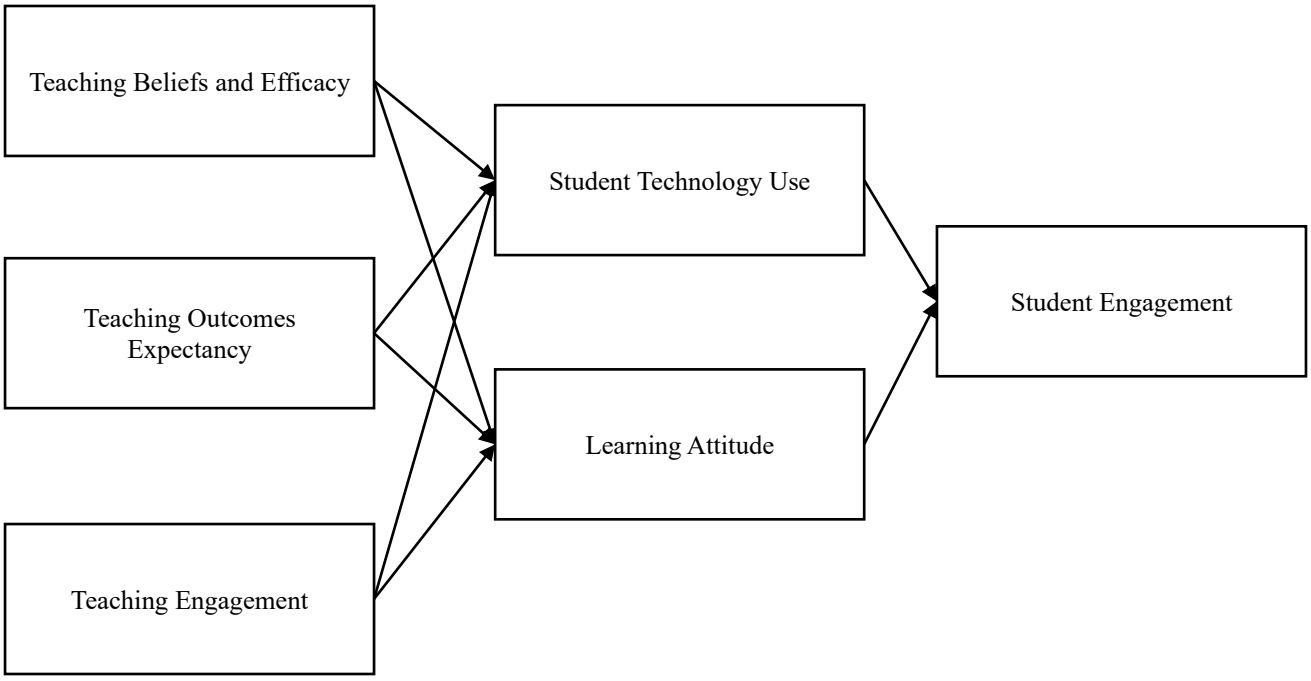

Figure 1: *Research Model.*

Methodology

For this research, quantitative data deemed instrumental in elucidating the relationships between variables and deriving insights from the findings. The study focused on teachers from public sector colleges in Iraq. To facilitate data collection, consent obtained from college administrators. A convenience sampling method employed, appropriate for studies where the population known and can reliably respond to a questionnaire. A Likert scale questionnaire was utilised for data collection. The questionnaire comprised two sections. The first section gathered demographic information from the respondents, while the second section included the study's instruments, employing a Likert scale format. Data collection conducted using printed questionnaires. Total 1,510 questionnaires distributed to public college teachers, and responses received from 1,357 individuals. Preliminary data analysis revealed that 1,298 responses were valid for further analysis, and these responses were finalised for the study. The research employed JASP version 0.19.0.0, a tool that is relatively novel in social science research for data analysis. This tool selected its capability to provide a comprehensive analysis and clarify the nature of the findings. JASP had previously been utilised by Murad, Othman and Kamarudin (2024) for similar analytical purposes. The analysis included a detailed description, single-factor model examination, fit measures, model fitness assessment, Pearson's correlations, scale reliability, and indirect effects analysis. The findings of this analysis presented in the subsequent section.

Findings

The findings from the descriptive statistics assessed to evaluate the normality of the data. Total 298 responses deemed valid for analysis, with no missing values. The mean scores and standard deviations were within normal ranges. To examine the distributional normality, the study assessed skewness and kurtosis, finding that the results fell within the recommended thresholds of -03 and +03, as suggested by Royston (1992). The minimum response recorded was 01, while the maximum was 05. As detailed in Table 1, the data demonstrated normality. Additionally, the reliability of individual scale items evaluated through factor loadings. According to Hair et al. (2021), factor loadings above 0.70 considered indicative of significant reliability for individual scale items. The results presented in Table 2 confirm that all scale items met this reliability threshold, with loadings exceeding 0.70. Therefore, the reliability of each item was satisfactorily achieved, as evidenced by the statistics in Table 2.

Table 1: *Descriptive Statistics.*

	TBE	TOE	TE	STU	LA	SE
Valid	1298	1298	1298	1298	1298	1298
Missing	0	0	0	0	0	0
Mean	3.275	3.279	3.326	3.409	3.396	3.295
Std. Deviation	1.154	1.169	1.197	1.186	1.180	1.220
Skewness	-0.010	-0.035	-0.069	-0.105	-0.164	-0.021
Std. Error of Skewness	0.141	0.141	0.141	0.141	0.141	0.141
Kurtosis	-1.004	-1.035	-1.181	-1.275	-1.076	-1.232
Std. Error of Kurtosis	0.281	0.281	0.281	0.281	0.281	0.281
Minimum	1.000	1.000	1.000	1.000	1.000	1.000
Maximum	5.000	5.000	5.000	5.000	5.000	5.000
25th percentile	2.000	2.000	2.000	2.000	2.000	2.000
50th percentile	3.000	3.000	3.000	4.000	3.500	3.000
75th percentile	4.000	4.000	4.000	4.000	4.000	4.000

Table 2: *Standardized Loadings of the Single-Factor Model.*

	Loading
TBE	0.761
TOE	0.765
TE	0.769
STU	0.787
LA	0.763
SE	0.797

The fit measures for the single-factor model were analysed to assess model adequacy. The Chi-Square statistic was utilised for this purpose, with a significance threshold set at the 95% probability level, as recommended by McHugh (2013). As indicated in Table 3, the model achieved a significant probability level ($p < 0.05$), confirming that the model fit was satisfactory. Additionally, the R-Squared (R^2) values examined to determine the proportion of variance explained by the antecedent variables for the dependent variable, student engagement. The data presented in Table 4 revealed that the antecedent variables accounted for 56% of the variance in student engagement. Similarly, 49% of the variance in student technology use and 48% of the variance in learning attitudes explained by these antecedent variables. These findings detailed in Table 4. Pearson's correlations assessed to examine the relationships between variables, including their nature and direction (positive or negative). Significant correlations were established at the $p < 0.05$ level, as per the criteria set by Benesty et al. (2009). Table 5 illustrates that all variables were positively and significantly correlated with each other, confirming the presence of meaningful relationships.

Table 3: *Fit Measures of Single Factor Model Fit.*

Fit Measure	Value
Chi-Square	10.852
df	9.000
P.Value	0.006
RMSEA	0.026
Lower 90% CI RMSEA	0.000
Upper 90% CI RMSEA	0.073
SRMR	0.016

Table 4: *R-Squared.*

	R^2
SE	0.568
STU	0.497
LA	0.482

Table 5: *Pearson's Correlations.*

			Pearson's r		p	Lower 95% CI	Upper 95% CI	Covariance
TBE	-	TOE	0.614	***	< .001	0.538	0.681	0.829
TBE	-	TE	0.586	***	< .001	0.506	0.656	0.809
TBE	-	STU	0.611	***	< .001	0.534	0.678	0.836
TBE	-	LAs	0.578	***	< .001	0.497	0.649	0.786
TBE	-	SE	0.569	***	< .001	0.487	0.641	0.801
TOE	-	TE	0.570	***	< .001	0.488	0.642	0.798
TOE	-	STU	0.588	***	< .001	0.508	0.657	0.815
TOE	-	LA	0.601	***	< .001	0.523	0.669	0.829
TOE	-	SE	0.596	***	< .001	0.518	0.665	0.850
TE	-	STU	0.603	***	< .001	0.525	0.671	0.856
TE	-	LA	0.595	***	< .001	0.517	0.664	0.840
TE	-	SE	0.621	***	< .001	0.546	0.686	0.907
STU	-	LA	0.569	***	< .001	0.487	0.642	0.797
STU	-	SE	0.656	***	< .001	0.586	0.716	0.949
LA	-	SE	0.618	***	< .001	0.543	0.684	0.889

* p < .05, ** p < .01, *** p < .001

The reliability of the data assessed using McDonald's omega (ω), with a significance threshold set at 0.70. Values exceeding this threshold considered indicative of significant reliability for scale items, allowing for valid further analysis. The results presented in Table 6 confirm that the scale items achieved a significant level of reliability. Mediating analyses conducted to examine the relationships between variables. The study focused on testing mediating relationships where a significance level of $p < 0.05$ deemed necessary for hypothesis validation, as per the guidelines established by Hair et al. (2021). The findings indicate that student technology use significantly mediates the relationship between teaching beliefs and efficacy and student engagement. Additionally, student technology use found to mediate the impact of teaching outcome expectancy on student engagement. Furthermore, the research revealed that student technology use also mediates the relationship between teaching engagement and student engagement. The analysis also demonstrated that learning attitude mediates the effects of teaching beliefs and efficacy on student engagement. Similarly, learning attitude was found to mediate the relationship between teaching outcome expectancy and student engagement. Additionally, learning attitude mediates the impact of teaching engagement on student engagement. The detailed results of the hypothesis testing reported in Table 7.

Table 6: *Frequentist Scale Reliability Statistics.*

Estimate	McDonald's ω
Point Estimate	0.900
95% CI Lower Bound	0.882
95% CI Upper Bound	0.917

Table 7: *Indirect Effects.*

									95% Confidence Interval	
					Estimate	Std. Error	Z-Value	P	Lower	Upper
TBE	→	STU	→	SE	0.089	0.024	3.729	< .001	0.042	0.136
TBE	→	LA	→	SE	0.049	0.018	2.759	0.006	0.014	0.084
TOE	→	STU	→	SE	0.073	0.022	3.388	< .001	0.031	0.116
TOE	→	LA	→	SE	0.064	0.020	3.124	0.002	0.024	0.104
TE	→	STU	→	SE	0.088	0.023	3.847	< .001	0.043	0.133
TE	→	LA	→	SE	0.063	0.020	3.159	0.002	0.024	0.102

Discussion

The findings of this research substantiate that student technology use significantly mediates the impact of teaching beliefs and efficacy on student engagement. This relationship corroborates prior research, which highlights the pivotal role of technology in educational settings. Wang (2023) emphasises that technology in educational institutions is crucial for enhancing students' comprehension and participation in classroom activities (Eltahir et al., 2021; Tessitore et al., 2021). Yu, Chen and Hou (2021) also find that students' attitudes and productivity in the classroom improve when they receive assistance from teachers. However, Jia et al. (2022) caution that limited interaction with technology can adversely affect performance, although this impact might not always be significant (Pham & Hanh, 2023). Qasim et al. (2021) observe that the current era is marked by the use of technology to support and advance ongoing technological developments. Rivera and Garden (2021) argue that teachers should aid and motivate students in acquiring and utilising technology effectively. Additionally, students should undergo comprehensive training to enhance their technical skills via technology-based classroom modules. This training would encourage students to engage more actively in classroom activities, which are vital for their academic success (Eltahir et al., 2021). Hence, it recommended that students utilise technology positively influence their character and academic achievements.

Further, the study finds that student technology use mediates the impact of teaching outcome expectancy on student engagement. This relationship aligns with earlier findings. Didion, Toste and Wehby (2020) highlight that teachers' expectations regarding educational outcomes are crucial for student academic achievement. Navarro et al. (2020) also indicate that high levels of motivation significantly enhance students' learning progress. Motivation is a key predictor of student success in addressing contemporary challenges (Flavell, 2023; Karabchuk & Roshchina, 2023). Eltahir et al. (2021) stress that the use of technology is essential for engaging students in the learning process. Motivated students should leverage technology to improve their performance. Karabchuk and Roshchina (2023) further affirm that technology plays a critical role in facilitating learning and active classroom participation. Veluvali and Surisetti (2022) support this view, asserting that when teachers use technology to deliver course materials, students must also use technology to enhance their behaviour and learning. Tessitore et al. (2021) argue that teachers must be highly motivated effectively engage students in technology-enhanced classroom activities. Thus, both teaching outcome expectations and students' use of technology are vital determinants of student learning.

The study also shows that technology adoption moderates the relationship between teaching engagement and student engagement. The above finding is in concordance with other related research studies conducted in the past. According to Hellín et al. (2023), for teachers to address their students properly, they ought to be involved. It is a critical factor because technology involves maintaining social connectivity between educators and students, thus improving human capital through acquiring knowledge and improving performance (Liu et al., 2023; Rivera & Garden, 2021). According to Tessitore et al. (2021) students, it is essential for them to have higher motivation to optimize the learning process and achieve strategic performance. According to Busebaia and John (2020), the use of technology is crucial in engaging students and teachers meaningfully. In order for the students to incorporate technology into their classroom activities, they have to engage and interrelate with their teachers. Didion et al. (2020) align with the opinion who assert that the performance among the students enhances when they well guided by their teachers. According to Hussein et al. (2020), the teachers also need to be professionally involved and committed to their duties, as this enhances the performance of the students. On the other hand, students' participation plays a vital role in the effectiveness of teachers (Flavell, 2023; Karabchuk & Roshchina, 2023).

The findings further indicate that learning attitude mediates the impact of teaching beliefs and efficacy on student engagement. This is consistent with previous research. Sulaiman et al. (2022) argue that students' attitudes significantly influence their learning, shaped by their overall behaviour. Qureshi et al. (2023) find that motivated students are more committed to improving their performance. Students lacking motivation face challenges in their learning process (Hellín et al., 2023). Instructors play a crucial role in enhancing students' learning experiences. Veluvali and Surisetti (2022) note that students perform exceptionally well when supported by teachers and parents, which enhances cognitive development and learning capabilities (Umar & Ko, 2022). However, minimal student engagement does not significantly affect academic achievement (Yu et al., 2021). Rivera and Garden (2021) assert that teachers expected actively contribute to students' learning progress. Engaging students in their learning is crucial for their performance, highlighting the importance of active student participation with professors (Didion et al., 2020), which significantly affects long-term academic success.

Similarly, the study finds that learning attitude mediates the impact of teaching outcome expectancy on student engagement. This aligns with earlier findings. Rivera and Garden (2021) discuss that each student has a unique way of interacting with teachers and managing their coursework. Karagianni and Drigas (2023) observe that students with a positive attitude towards their performance are more engaged in classroom activities. Students who lack motivation receive less support from teachers (Mashhadi et al., 2022). Developing positive intentions is crucial for enhancing learning. Qureshi et al. (2023) emphasise that student motivation is critical for engagement and performance in the classroom. The extent of student involvement and their acquisition of knowledge and skills influenced by their disposition towards learning and their ability to demonstrate competence (Karagianni & Drigas, 2023). Busebaia and John (2020) report that supporting students in their learning significantly affects their long-term performance. The students' learning approach is a crucial factor in improving their overall academic performance and involvement in classroom tasks.

This study also shows that in addition to teaching engagement, learning attitude also plays intermediary role of moderating in the case of student engagement. This relationship is parallel with the prior studies carried out in this field of study. As per the findings of Liu et al. (2023), the role of teachers majorly lies in enhancing students' achievements and well-being. Shenoy, Mahendra and Vijay (2020) proved that motivation is crucial in increasing the performance of any teacher especially if he/she is highly motivated. Flavell (2023) has noted that it is essential to help the students to gain specific knowledge and accomplish certain tasks to meet organisational goals. It must appreciate that students' learning attitudes change (Waham et al., 2020); therefore, their level of engagement in the work influences their academic activity (Wang, 2023). This is in agreement with the findings of Raes et al. (2020) where the importance of the role of the teacher in enhancing the student is learning and performance has highlighted. This is one of the dimensions, that has to receive much attention depending on whether it is high or low, because of the effect it has on performance (Liu et al., 2023). According to the Shenoy et al. (2020), a teacher should give more time to students because this has more impact on academic performance. To sum up, students with positive learning attitude maintain a high level of achievements as compared to those with less conducive attitudes towards learning supported by their teachers (Pham & Hanh, 2023).

Academic and Policy Implications

This research carries both academic and policy implications. Academically, the study introduces two novel mediating variables and explores their relationships within the existing body of literature. Specifically, it contributes to our understanding by demonstrating that student technology use significantly mediates the effects of teaching beliefs and efficacy on student engagement. Additionally, it shows that student technology use also mediates the impact of teaching outcome expectancy on student engagement. These findings extend the literature by illustrating that technology use is a crucial factor in mediating the relationship between teaching engagement and student engagement. Moreover, the research enhances academic knowledge by highlighting that learning attitude mediates the effects of teaching beliefs and efficacy on student engagement. It also provides evidence that learning attitude mediates the impact of teaching outcome expectancy on student engagement. Finally, the study advances the literature by showing that learning attitude mediates the influence of teaching engagement on student engagement. Collectively, these contributions enrich the academic discourse on the factors influencing student engagement. From a practical perspective, the study underscores the importance of both student technology use and 21st-century learning attitudes as significant determinants of student engagement. It reveals that teaching beliefs and efficacy play a critical role in enhancing student engagement. In light of these findings, public sector colleges in Iraq should focus on teacher training and development to foster greater student engagement. The study suggests that improving teaching outcome expectancy could also be a novel approach to enhancing teachers' overall performance and student engagement in the classroom. Additionally, the research highlights the importance of teaching engagement as a novel factor for improving student engagement levels in Iraq. Effective use of technology by college students is emphasised as essential for boosting their interest and involvement in college activities. Developing a positive learning attitude among students recommended improving their understanding of the subject matter and, consequently, their engagement. The study advises policymakers to focus on these areas to enhance student engagement and learning outcomes in Iraq. By addressing these key factors, anticipated that significant improvements in student engagement and academic performance achieved.

Future Directions

The findings of this research offer valuable contributions to the literature, yet several limitations acknowledged. Firstly, the study's sample is limited to public sector colleges in Iraq. This focus excludes private sector colleges, which could offer additional insights into student engagement across different educational contexts. Future research is therefore encouraged to include data from private sector colleges to provide a more comprehensive understanding of the factors influencing student engagement. Secondly, the study employed cross-sectional data to assess student engagement. While cross-sectional analysis provides a snapshot of the variables at a single point in time, it does not capture changes over time. Previous studies have measured student engagement using longitudinal data, which allows for the examination of how engagement evolves. Due to constraints related to time and resources, this research was limited to cross-sectional data. Future studies should consider adopting a longitudinal approach to understand the dynamics of student engagement over time. Additionally, this research concentrated solely on Iraq. Although it offers a novel contribution to the literature by focusing on this specific context, expanding the scope to include data from neighbouring countries such as Iran and Syria could provide a broader perspective. Such comparative studies would enrich the literature and offer a more global view of the factors influencing student engagement. In summary, while this study significantly advances our understanding of student engagement, addressing these limitations in future research will enhance the robustness and generalisability of the findings.

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