Acta Educationis Generalis
Volume 16, 2026, Issue 1

DOI: 10.2478/atd-2026-0006

Teachers' Technological Attitudes and Technology Use in North-Eastern Urban Public Schools

Lenny Washington*

Received: August 5, 2025; received in revised form: January 22, 2026;
accepted: January 23, 2026

Abstract:
Introduction: US school districts often purchase technology without considering teacher attitudes, leading to significant underutilisation in urban K-12 classrooms.
Methods: This quantitative, correlational study examined associations between technological attitudes, tenure, gender, and technology use frequency within north-eastern US urban districts.
Results: A survey of 130 teachers was analysed via linear regression to determine how attitudes, years of service, and gender predict classroom technology use. The findings identified technological attitudes, both independently and in combination with other predictors, as the primary driver for predicting frequency of use.
Discussion: Statistical analysis resulted in the rejection of the null hypothesis for all three research questions.
Limitations: The study faced communication delays from participating districts and the exclusion of 61 incomplete or duplicate surveys.
Conclusions: These results are vital for educational administrators making procurement decisions. Prioritising teacher attitudes can mitigate technology underutilisation and prevent the loss of school funding.

Key words: Abbott schools, behavioural intent, digital divide, public urban school districts, technological attitude, and technology underutilisation.

Introduction

In the 1990s, public schools began to invest heavily in classroom technologies, including computers and Internet access (Fenton, 2017; Howard & Howard, 2017). These investments increased as stakeholders recognised the role technology plays in creating a more prosperous future and ensuring students

* Lenny Washington, University of Phoenix, Phoenix, USA; lenny.washington316@gmail.com; ORCID: 0009-0009-2205-1769

acquire necessary skills for technology-enriched environments (Borowiak & Davis, 2021; Fenton, 2017; Howard & Howard, 2017; Kormos, 2018; Kormos & Julio, 2020; Niazov, 2020). However, a digital divide persists across different urban schools in the United States (Fenton, 2017; Howard & Howard, 2017; Kormos, 2018; Serin & Bozdag, 2020). This gap can cause a split in learning outcomes between students with access and those without.

Russell, O'Dwyer, Bebell, and Tao (2007) investigated educational technology integration regardless of a teacher's experience or length of service, finding that newer teachers are more likely to integrate technology into the classroom than teachers with longer tenures. While teachers express a need for relevant technology to become more efficient, factors such as tenure, age, and a lack of teacher-influenced procurement influence their willingness to use these tools (Howard & Howard, 2017; Serin & Bozdag, 2020).

The core problem is that school districts in the United States purchase technology without consideration for teacher attitudes, resulting in technology underutilisation in K-12 urban public-school education. Over the last two decades, school districts have spent millions of dollars on technology and training in underused classrooms (Fenton, 2017; Niazov, 2020; Veiga & Andrade, 2021). Negative attitudes towards technology are likely a cause for this underutilisation. Currently, teachers are expected to use emerging technologies regardless of their comfort level or prior experience; consequently, those with limited experience are more likely to become frustrated (Serin & Bozdag, 2020). This underutilisation of technology can cause teachers to be less effective and creates gaps in student development, placing urban students further behind their peers academically and socially. This study extends previous research to identify a significant relationship between teacher use and technological attitudes to understand underutilisation in urban schools.

1 Purpose

The purpose of this quantitative, correlational study was to examine any existing association between teacher attitudes towards and the use of technology in north-eastern United States K-12 urban public school districts. The outcome variable for the study included the frequency of technology use in the classroom, while the predictor variables were the teacher's technological attitudes, years of service, and gender.

Understanding these relationships is significant because research indicates that individuals are likely to behave according to their attitudes (Myers & DeWall, 2020; Serin & Bozdag, 2020). If the study results indicate a significant relationship between the predictor and outcome variables, public school officials may decide to implement technology-use interventions to improve attitudes towards technology. Such interventions may decrease technology

underutilisation. This study can benefit stakeholders - including teachers, students, and educational leadership - by providing information to make informed decisions that can affect the lives of those involved in education.

2 Conceptual framework

Two selected theories create the conceptual foundation for this study: Transformational Leadership and the Technology Acceptance Model (TAM). These theories inform the understanding of teacher technology use, attitudes, and the assumptions surrounding underutilisation.

2.1 Transformational Leadership

Transformational Leadership focuses on the reciprocal relationship between leaders and followers to promote growth and productivity (Burns, 1978). In an educational context, this theory helps leaders and followers understand the differences between management and leadership, influencing the characteristics and behaviour of both parties. This study applies this lens to question school administration purchasing decisions that may affect K-12 urban teachers' technology use. The objective is to provide data to school leaders that may influence working with teachers during procurement to increase motivation, morale, and positive attitudes towards technology.

2.2 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) represents how adopters use technology based on behavioural intent and actual system use (Davis, 1989). Within this model, perceived usage (PU) indicates a person's attitude towards a system enhancing job performance, while perceived ease-of-use (PEOU) indicates the effort required to use the system effectively.

In this study, behavioural intent coincides with a teacher's technological attitude, while actual system use occurs in K-12 urban public schools. A user's attitude influences behavioural intent, creating the commitment to utilise the technology.

2.3 Washington Technological Attitudes Model (WTAM)

The Washington Technological Attitudes Model (WTAM) illustrates the interconnectedness of these theories. As shown in Figure 1, behavioural intent influences the predictor of technological attitudes. The model suggests that predictors - technology attitudes, years of service, and gender - may affect the frequency of technology use either independently or collectively. Furthermore, transformational leadership directly influences administrators, who in turn affect whether teachers frequently use or underutilise technology in the classroom.

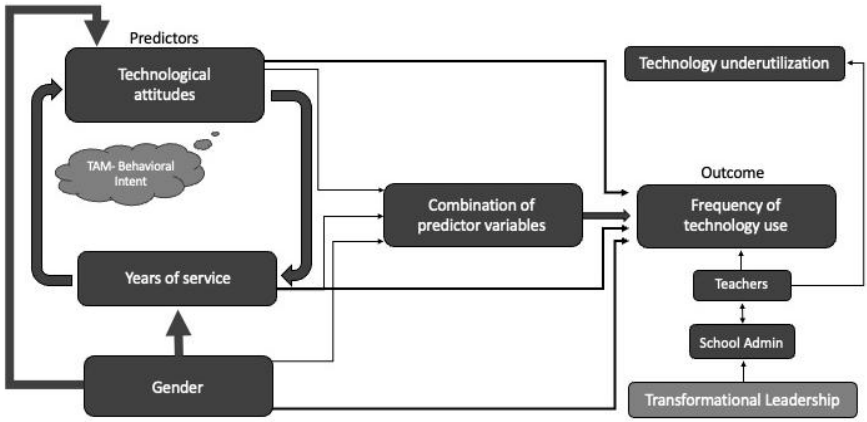

Figure 1. Illustration of the conceptual framework - WTAM.

3 Methods

A correlational design was used to investigate the relationship between two or more variables using surveys, allowing for inferences regarding administrative technology procurement using magnitude (Creswell & Creswell, 2018; Myers & DeWall, 2020). This design was appropriate as it explains the association among variables without randomly assigning participants to treatment conditions (Creswell & Creswell, 2018). This study investigated three research questions and three hypotheses concerning the frequency of technology use and teacher technological attitudes, years of service, and gender.

3.1 Research questions and hypotheses

This study attempted to answer the following three research questions:

- RQ1: Do teachers' attitudes towards technology, years of service, and gender predict the frequency of technology use in the classroom?
  - H_{01}: There is no significant relationship between teachers' attitudes towards technology, years of service, gender, and the frequency of technology use in the classroom.
  - $H_{\alpha 1}$: A significant relationship exists between teachers' attitudes towards technology, years of service, and gender and the frequency of technology use in the classroom.

- RQ2: What is the unique ability of teachers' attitudes towards technology, years of service, and gender to predict the frequency of technology use in the classroom?
  - H_{02}: There is no unique ability among teachers' attitudes towards technology, years of service, and gender to predict the frequency of technology use in the classroom.
  - $H_{\alpha 2}$: A unique ability exists between teachers' attitudes towards technology, years of service, and gender and the frequency of technology use in the classroom.
- RQ3: Which variable or combinations of variables of teachers' attitudes towards technology, years of service, and gender predict the frequency of technology use in the classroom?
  - H_{03}: No variable or combinations of variables among teachers' attitudes towards technology, years of service, and gender significantly predict the frequency of technology use in the classroom.
  - $H_{\alpha 3}$: A variable or combinations of variables exists between teachers' attitudes towards technology, years of service, and gender and the frequency of technology use in the classroom.

3.2 Setting, population, and sample

The study was approved by a regionally accredited university's Instructional Review Board (IRB). Out of 31 urban school districts contacted in the north-eastern region of the United States, three agreed to participate. The sample consisted of 130 certified K-12 teachers. An a priori power analysis confirmed that 119 participants was the minimum sample size required to determine an effect with three fixed predictor variables, a power of 0.95, an error probability of 0.05, and a medium effect size of 0.15 (Faul, Erdfelder, Buchner, & Lang, 2009).

Participant's gender identity included 18 males, 110 females, one non-binary/non-conforming, and one individual who preferred not to disclose their gender. The participants identified ethnically as either White (67), Black/African American (48), Hispanic/Latinx (22), American Indian/Alaska Native (4), Asian (1), or Native Hawaiian/Other Pacific Islander (1). These participants further identified themselves on the survey by their highest education completed, age, years taught at their present school, and the grade level they were teaching at the time of the survey (see Table 1).

Table 1

Sociodemographic characteristics of the participants

Baseline characteristic	*Full sample*	
	n	*%*
Highest level of education		
Bachelor's	30	23.08
Bachelor's plus additional graduate hours	23	17.69
Master's	32	24.62
Master's plus additional graduate hours	36	27.69
Doctorate	9	6.92
Age		
18-30	14	10.77
31-40	32	24.62
41-50	45	34.62
51-60	30	23.08
61+	9	6.92
Years taught at current school		
Less than 1 year	22	16.92
1-2 years	12	9.23
3-5 years	29	22.31
6-10 years	30	23.08
11-15 years	12	9.23
More than 15 years	25	19.23
Grade level taught		
Elementary School (Pre-K - 4^{th})	45	34.62
Middle School (5^{th} - 8^{th})	38	29.23
High School (9^{th} - 12^{th})	47	36.15

3.3 Materials and instrumentation

Data were collected using a survey consisting of 62 items: eight demographic questions, 34 technology use questions, and 20 technological attitude questions. The instruments were adapted with permission from the USEIT survey (Russell et al., 2007) and the Technology Attitude Survey (TAS) (McFarlane, Green, & Hoffman, 1997), omitting non-congruent items.

The USEIT survey produced five scales with high reliability (>0.70), and the TAS also yielded high-reliability results (α=0.92). Because non-modified versions were used (except for the removal of non-congruent items), reliability coefficients remained intact.

3.4 Data collection and analysis

Surveys were administered online via ZohoSurvey, with links forwarded by district administrators. Data collection spanned four weeks, with weekly reminder emails. Statistical analysis was conducted using SPSS v29.

Variable coding was as follows:

- Frequency of Technology Use: Measured on a 5-point Likert-type scale from 1 (never) to 5 (daily/several times a week).
- Technological Attitudes: Measured on a 7-point Likert-type scale from 1 (not true) to 7 (very true). Reverse coding was applied to negative attitude questions.
- Years of Service: Categorised into six options ranging from "less than 1 year" (1) to "more than 15 years" (6).
- Gender: Coded as male (1), female (2), non-binary (3), or prefer not to say (4).

Multiple linear regression was the appropriate statistical test for testing more than two predictors when the predictors are known (Creswell & Creswell, 2018).

4 Results

The following results address the study's three research questions by analysing the relationships between teacher technological attitudes, years of service, gender, and frequency of technology use. For gender analysis, only male and female results were included for statistical significance, as the single respondents for other categories could not be processed by the software.

4.1 Descriptive statistics

Descriptive statistics, including the mean and standard deviations for all variables, are presented in Table 2.

Table 2

Means and standard deviations

	n	*Mean*	*Std Dev*
Frequency of technology use	130	3.7758	.45864
Technological attitudes	130	4.3581	.48207
Years of service	130	4.2115	1.30720
Gender	130	1.8846	.40605

4.2 Predictors of technology use (R1)

A linear regression established that technological attitudes, years of service, and gender significantly predict the frequency of technology use in the classroom, $F(3, 126)=6.805$, $p<.001$. Collectively, these variables accounted for 13.9% of the explained variability in technology use among teachers. These findings support the rejection of the null hypothesis for R1, confirming a significant relationship exists between the predictors and the outcome variable.

4.3 Unique ability of predictors (R2)

Linear regression was used to determine the unique ability of each predictor to affect the outcome. As shown in Table 3, technological attitudes were the only predictor to indicate statistical significance independently.

Table 3

Unique ability data

	df	*F*	*Sig*	R^2
Technological attitudes	1, 128	16.146	<.001	.112
Years of service	1, 128	4.705	.032	.035
Gender	1, 128	.001	.982	.000

Note. Data displays the predictor variables' ability to predict the outcome variable.

4.4 Variable combinations (R3)

Further analysis determined which individual or combination of factors predict usage frequency. The data established that technological attitudes alone, or in combination with years of service or gender, significantly predict the frequency of technology use (see Table 4).

Table 4

Combination of outcome effects

Predictor variable combinations	*df*	*F*	*Sig*	R^2
Technological attitudes alone	1, 128	16.146	<.001	.112
Years of service alone	1, 128	4.705	.032	.035
Gender alone	1, 128	.001	.982	.000
Technological attitudes and years of service	2, 127	10.222	<.001	.139
Technological attitudes and gender	2, 127	8.105	<.001	.113
Years of service and gender	2, 127	2.335	.101	.035
All predictors combined	3, 126	6.805	<.001	.139

Note. Data displays combinations of predictors and their effects on the outcome variable.

5 Discussion and implications

The data analysis resulted in the rejection of the null hypothesis for all three study hypotheses. These findings align with previous research indicating that technological attitudes are a common variable in predicting the frequency of technology use in the classroom. While previous studies noted that urban teachers may have poorer attitudes and use technology less than rural or suburban teachers, this study confirmed that when teacher attitudes are higher, they are more likely to increase the frequency of their technology usage.

Technological attitudes were established as the unique ability that predicts increases in teacher technology use. Removing technological attitudes as a predictor resulted in a lack of statistical significance for technology use in the classroom, regardless of the combination of other variables such as gender or years of service. This confirms that gender and years of service independently do not significantly affect a teacher's use of technology.

5.1 Implications for leaders and practitioners

The findings demonstrate that technological attitudes and teacher technology use directly affect each other; specifically, more positive attitudes lead to more frequent use. Technology underutilisation in K-12 urban education often results from a lack of considering teacher attitudes during the procurement process.

Administrators and practitioners have the opportunity to include teachers in purchasing decisions to help prevent the underutilisation of technology. Understanding teacher technological attitudes can lead to targeted purchasing and technology acceptance. Prioritising collaboration with teachers before purchasing ensures proper school spending and ensures that funding is well-spent on technology that will actually be utilised.

5.2 Limitations

A significant limitation of this study was the inconsistent communication from one participating school district, which failed to transmit weekly reminder emails to eligible participants. This may have restricted the volume of responses collected from that district. Additionally, the survey website configuration - specifically the deactivation of IP address capture and "resume" functions to maintain participant anonymity - resulted in several incomplete submissions. Consequently, 61 duplicate surveys were eliminated through cross-referencing duplicate participant IDs.

5.3 Recommendations for future research

Future quantitative research should consider incorporating different predictors alongside technological attitudes, such as ethnicity, age, and education level. As this study was restricted to the north-eastern United States, replicating the research in different regions or countries could further validate the relationship between attitudes and technology use.

Furthermore, given the rapid evolution of digital tools, investigating teacher attitudes towards OpenAI and other AI applications is essential for informed administrative decision-making. Finally, employing qualitative methods, such as individual interviews or focus groups, would allow researchers to explore the specific motivations and behaviours influencing why teachers select certain technologies over others.

Conclusions

These findings are generalisable to urban K-12 public school teachers in the north-eastern region of the United States. Wasting school funds on underused technology is avoidable if leaders collaborate with teachers who are the primary users of these tools. Ultimately, ensuring proper technology use among teachers through the consideration of their attitudes can reduce the digital divide among students and ensure more effective educational environments.

References

Borowiak, H., & Davis, T. (2021). Teacher's perception of student technology use. *CTE Journal, 9*(1), 68-83.

Burns, J. M. G. (1978). *Leadership*. New York, NY: Harper & Row.

Creswell, J. W., & Creswell, J. D. (2018). *Research Design, Qualitative, Quantitative, and Mixed Methods Approaches* (5th ed.). Sage Publications.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319-340. https://doi.org/10.2307/249008

Faul, F., Erdfelder, E., Buchner, A., & Lang, A. G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods, 41*(4), 1149-1160. https://doi.org/10.3758/BRM.41.4.1149

Fenton, D. (2017). Recommendations for professional development necessary for iPad integration. *Educational Media International, 54*(3), 165-184. https://doi.org/10.1080/09523987.2017.1384150

Howard, N., & Howard, K. E. (2017). Using tablet technologies to engage and motivate urban high school students. *International Journal of Educational Technology, 4*(2), 66-74.

Kormos, E. (2018). The unseen digital divide: Urban, suburban, and rural teacher use and perceptions of web-based classroom technologies. *Computers in the Schools, 35*(1), 19-31. https://doi.org/10.1080/07380569.2018.1429168

Kormos, E., & Julio, L. (2020). Contrasting instructional technology adoption in k-12 education to promote digital equity. *International Journal of Web-Based Learning & Teaching Technologies, 15*(3), 19-30. https://doi.org/10.4018/IJWLTT.2020070102

McFarlane, T. A., Green, K. E., & Hoffman, E. R. (1997). *Teachers' Attitudes toward Technology: Psychometric Evaluation of the Technology Attitude Survey.* Chicago, IL: Paper presented at the Annual Meeting of the American Educational Research.

Myers, D. G., & DeWall, C. D. (2020). *Myers' Psychology for the AP® Course* (3rd ed). Macmillan Higher Education.

Niazov, A. (2020). Run over by the globe: Overcoming the flat world and reinventing the educational wheel in U.S. urban schools. *Education and Urban Society, 52*(2), 215-233. https://doi.org/10.1177/0013124518823954

Russell, M., O'Dwyer, L., Bebell, D., & Tao, W. (2007). How teachers' uses of technology vary by tenure and longevity. *Journal of Educational Computing Research, 37*, 393-417. https://doi.org/10.2190/EC.37.4.d

Serin, H., & Bozdag, F. (2020). Relationship between teachers' attitudes towards technology use in education and autonomy behaviors. *Turkish Online Journal of Educational Technology, 19*(3), 60-69.

Veiga, F. J. M., & Andrade, A. M. V. D. (2021). Critical success factors in accepting technology in the classroom. *International Journal of Emerging Technologies in Learning (iJET), 16*(18), 4. https://doi.org/10.3991/ijet.v16i18.23159