



Teacher Autonomy and Technology-Mediated Instruction: Organizational and Social Determinants in Rivers Secondary Schools

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Abstract

This paper analyses teacher autonomy and the extent of the use of technology in teaching and the social and organizational variables in Rivers State Secondary Schools. Using a descriptive correlational approach, data was gathered from 366 teaching staff in 12 public secondary schools. The results show a statistically significant positive correlation between teacher autonomy and the extent of use of technology in teaching ($r = 0.62$, $p < 0.05$). Of the organizational variables, social variables predict teacher autonomy, whereas social variables predict the extent of use of technology in teaching. Self-Determination Theory, Organizational Climate Theory, and TPACK help to unpack the results. The results show that more institutional support and a more collaborative school culture increases the level of digital pedagogy used. The authors call for a more decentralized approach to policy formulation, changes in the way administrators do things and more teacher training.

Keywords: Teacher autonomy, Technology-mediated instruction, Organizational climate, social determinants

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Introduction

The worldwide digitalization of education has altered the way teachers teach, how students learn, and the way teachers carry out their professional tasks (Santagata et al., 2024). For example, Technology-Mediated Instruction (TMI) such as learning management systems, virtual classrooms, blended learning, and other digital content has recently been integrated into the education system of Secondary Schools in Nigeria in Sub-Saharan Africa (Mohammad Nezhad & Stolz, 2025). The extent of such educational innovations will be successful dependent on the extent of teacher autonomy the degree of freedom teachers has regarding the professional use of instructional designs (Kim, 2026), classroom management, curriculum modifications, and the assessment of the students (Nguyen (Ruby) & Barbieri, 2025). Contemporary authors state that teacher autonomy is positively correlated to the extent of success in implementing educational innovations (Almusharraf, 2020), the extent of teachers' job satisfaction, and the extent to which students learn (Lin & Gao, 2023). The government-owned secondary schools in Rivers State Nigeria possess and showcase a highly bureaucratic way of managing schools as they neglect the centre that governs the controlling of curricula and policy formulation and focuses on accountability via examinations (Eryilmaz et al., 2025). Although teachers have had to acclimatize to the digital learning education systems as a result of the post-COVID era (Gong, 2025), they often claim that their digital resources, teaching methodologies (Ertaş & Pekmezci, 2025), and content that they may adapt to the context are limited (Garay Abad & Hattie, 2025). Literature indicates that the business-related factors of the specific type of leadership, the degree of support that the institution provides (Vieriu & Petrea, 2025), the availability of implemented training, and the policy-related factors are the most effective in either fostering or restraining the degree of teacher autonomy or teacher activity in the field of Technology-Mediated Instruction (Hsieh et al., 2025).

Social factors such as professional communities (Nir et al., 2024), expectations from peers (Lūsēna-Ezera et al., 2023), socio-cultural views of technology, and community standards determine how long and how much educational technologies will be used and accepted (Qin et al., 2025). In developing countries, infrastructure, social expectations, and the digital divide limit teachers' use of new methods (Lin, 2022). In Rivers State, the unequal distribution of school materials between urban and semi-urban schools aggravates the situation. Global studies (2021-2026) have shown that teacher autonomy in a conducive organizational context fosters adaptive expertise, creative teaching, and the use of technology (Jerrim et al., 2023). In a highly bureaucratic and support-deficient environment, teachers are discouraged from employing technology as a teaching aid (Fitrah et al., 2025). Hence, it is essential to articulate the social and organizational structures that grant teachers autonomy in the context of technology use in teaching and learning (Ahrari et al., 2021). Most studies on digital pedagogy in Nigeria focus on teacher autonomy and technology in other states (Liu et al., 2021). This study aims to examine the organizational climate and social influences on teacher autonomy in technology-related teaching practices

This study aims to examine the relationship between the level of autonomy secondary school teachers exercise and the socially and organizationally structured, technology integrated roles of the teacher in teaching in Rivers State. The specific objectives are to: Evaluate the autonomy of teachers in Rivers State secondary schools; Evaluate the extent to which teachers practice technology integrated teaching; Determine the impact of the organizational structure and processes on teachers' autonomy; Determine the impact of the organizational structure and processes on the extent of technology integrated teaching; Evaluate the impact of teachers' autonomy on the extent of technology integrated teaching.

Methodology

A descriptive correlational approach was used to examine the relationship of teacher

autonomy and technology-mediated instruction, and the organizational and social factors as variables. The total population of the study was 7,842 teachers in the public secondary schools in Rivers State, Nigeria (Rivers State Ministry of Education, 2025). (Handtke et al., 2022) sample size determination formula, at a 95% confidence interval, provided 366 teachers as the sample size. In order to obtain sufficient representation of teachers in the urban as well as the semi-urban schools, stratified random sampling was used. Depending on the accessibility of ICT and the coverage area of the schools, twelve public secondary schools were selected. Out of 400 questionnaires, 366 were returned (91.5% response rate).

The Teacher Autonomy and Technology Integration Scale (TATIS), a structured tool, was used to collect data. The tool consists of four sections, which include: demographic information, teacher autonomy (10 items), organizational factors (10 items), social factors (8 items), and practices of technology-enhanced teaching (12 items). Respondents used a box tick system on a 5-point Likert scale (SA = 5 to SD = 1). Content validity was evaluated by three experts from the Educational Technology and Educational Management of South-South Nigeria Universities. Their recommendations helped to address the questions on the alignment of constructs and measurement items. Construct validity was determined by Exploratory Factor Analysis (EFA), which indicated factor loadings of > 0.60 , which was satisfactory. The reliability of the scales was determined by Cronbach's Alpha, which resulted in teacher autonomy = 0.87, organizational factors = 0.84, social factors = 0.81 and technology enhanced instruction = 0.89, showing a high degree of internal consistency.

The data analysis was conducted using version 27 of the SPSS program. Pearson Product Moment Correlation was coupled with Multiple Regression Analysis at the 0.05 alpha level to test the described hypotheses, while the mean and standard deviation, which answered the research questions, were complemented with a description of the statistics.

Results

The ethical clearance, as usual, was obtained from the respective school authorities, and the respondents were assured that their identity would remain confidential. The methodological refinements also contribute to the strengthening of the reliability, validity, and generalizability of the findings, with regard to education in the Rivers State.

Table 1. Demographic representation of respondents

Variable	Category	Frequency	Percentage
Sex	Male	182	49.7%
	Female	184	50.3%
Age	25-34	98	26.8%
	35-44	152	41.5%
	45+	116	31.7%
Qualification	B.Ed/B.Sc	210	57.4%
	M.Ed/M.Sc	132	36.1%
	PhD	24	6.5%
Occupation	Classroom Teacher	310	84.7%
	Admin Staff	56	15.3%
Schools Selected	Government Secondary School, Borokiri	29	7.9
	Government Secondary School, Rumuokwuta	30	8.1

Community Secondary School, Rumuolumeni	33	9.0
Government Secondary School, Fimina	29	7.9
Government Secondary School,Ogbogoro	30	8.1
Community Secondary School, Elelenwo	29	7.9
Government Secondary School, Okrika	30	8.1
Community Secondary School, Omoku	30	8.1
Government Secondary School, Ahoada	32	8.7
Government Secondary School, Bori	31	8.5
Government Secondary School, Abuloma	30	8.1
Government Girls Secondary School, Harbour Road	33	9.0
Total	366	91.5%

Source: Authors Fieldwork, 2026

Balanced representation from both genders and an experienced teaching group was evidenced by 73% being over 35 years, which is indicative of considerable professional maturity. Substantial professional maturity adds depth to the data, especially since the majority of participants hold at least a bachelor's degree. The validity of the data is evidenced by the 91.5% response rate. The purposeful choice of 12 schools sufficiently captures the sample coverage in both urban and semi-urban areas of the state provides adequate representation in the context. Most respondents being classroom teachers also increased the validity of the experience reported. The participation recorded in the survey and the response rate so far, created a more valid survey and reduced the effects of non-response bias.

Table 2. Correlation Analysis

Variables	r	p-value
Teacher Autonomy & TMI	0.62	0.000

Teacher autonomy and Technology mediated instruction have a positive correlation ($r = 0.62$, $p < 0.05$). As teacher's professional autonomy increases, so does their engagement with digital pedagogy. The following table depicts a breakdown of positive and negative factors leading to teacher's autonomy and the instruction of technology mediated lessons: Organizational factors

positively predict teacher's autonomy, and Social factors positively predict instruction of technology mediated lessons. Social factors positively predict instruction of technology mediated lessons ($\beta = 0.31$). $R^2 = 0.54$

Table 3. Regression Analysis

Predictor	Beta	T	Sig
Organizational Determinants	0.48	6.12	0.000
Social Determinants	0.31	4.55	0.000

Hypothesis Testing

The first hypothesis was tested using Pearson's correlation coefficient. The positive correlation between teacher's autonomy and instruction of technology mediated lessons was statistically significant ($r = 0.62$, $p = 0.000 < 0.05$), and hence, the first hypothesis was proven wrong. To test the second hypothesis, multiple regression analysis was used. Organizational factors were the only significant predictors of teacher's autonomy ($\beta = 0.48$, $t = 6.12$, $p = 0.000$). Thus, the second hypothesis was proven wrong. The third hypothesis was proven true, as it was shown that social factors were the only significant predictors of instruction of technology mediated lessons ($\beta = 0.31$, $t = 4.55$, $p = 0.000$).

Discussion

The results obtained extend support for Self-Determination Theory (Ika Sari et al., 2024). The results extend support to autonomy that encourage pedagogical innovation as put forth by (Rathnasekara et al., 2025). Teachers' feeling of autonomy in decision making instruction stimulates their intrinsic motivation to utilize digital teaching resources. Organizational elements confirmed the Organizational Climate Theory (Farrell et al., 2024) regarding predictive autonomy (Johler, 2022). Constructive leadership, ICT, and participative frameworks for school decision-making foster teacher agency. In Rivers State, largely bureaucratic regions, autonomy is found in schools with a transformative leadership style. Social elements also fused with adopting technology (Kholid & Supriyadi, 2026). Peer positive norms and collaborations, as reviewed (Wang et al., 2025), resulted in digitally innovative teaching (Kaputa et al., 2022). In socially cohesive schools, collaborative resources and digitally created content. The integration with the TPACK framework indicates that teacher autonomy spells the confident engagement with and integration of technology, pedagogy, and content knowledge (Cress & Kalthoff, 2023) to enhance the learning of students. The integration of technology without autonomy leans towards compliance rather than innovation (Peruzzo & Allan, 2024). The results validate the structural and social elements combined to impact teacher autonomy and digital pedagogy (Dr K M A Ahamed Zubair, 2026). In Nigerian studies, the context of technology use goes beyond a question of infrastructure, but also the organizational and motivational aspects (Menrisal, 2023).

In the context of teacher autonomy in the post-COVID era, the (Haapaniemi et al., 2021) reported for Europe that teacher autonomy reached its peak during the digital teaching learning period with curriculum development and technologically integrated teaching (Masoumi & Noroozi, 2025). Teacher autonomy in the use of technology in teaching was supported by a robust system that included managerial support, access to ICT, and professional development. The adoption of technology across Africa is influenced by several structural and socio-cultural elements. According to (Beardsley et al., 2021), the lack of digital infrastructure, intermittent and unreliable electricity, and centralized bureaucratic structures limit discretionary teaching technology adoption in most of Sub-Saharan Africa. The same findings have been reported in Nigerian studies. (Raave et al., 2024) noted that Institutional support, particularly from leadership, and the provision of digital tools, has a significantly positive predictive value for the assimilation of technology in the Nigerian secondary education system. Nevertheless, teacher autonomy was not considered as a possible intervening

variable (Val & López-Bueno, 2024). The importance of social factors cannot be overlooked. Research has demonstrated that collegial collaboration and peer guidance, as well as digital communities of practice, positively impact teachers' confidence to leverage technology in their classrooms (Alptekin & Taneri, 2025). Teachers that work in a socially encouraging environment are more likely to make their digital materials available and work together to create online lessons (Doğuş & Tabak, 2024). In more hierarchically dominant cultures, the lower levels do not promote experimentation and innovation (Shi et al., 2025).

Conclusion

This study provides empirical evidence that teacher autonomy is a critical determinant of technology-mediated instruction in Rivers State secondary schools. It is critical to understand that teacher autonomy is not simply a personal attribute but a reflection of the organizational and social ecosystem. Teacher autonomy and the innovative use of technology are positively impacted by supportive school leadership and a professionally collaborative culture of democracy. In contrast, strong informal controls from the centre and a lack of systemic supports reduce teachers' instructional autonomy. The organizational factors influencing policy initiatives justify the need to redistribute teaching and instructional decision-making roles. The supportive organizational context mirrors the ideal conditions for the digital integration of teaching and learning reforms in educational systems worldwide as outlined in the latest reports of the Organisation for Economic Co-operation and Development and the United Nations Educational, Scientific and Cultural Organization. The research findings prove that the social factor particularly, collegial collaboration most significantly contributes to the integration of technology in teaching. This implies the necessity for the establishment of professional learning communities in all secondary schools in Rivers State. Integrating Self-Determination Theory, Organizational Climate Theory, and the TPACK framework provides a holistic understanding of the digital pedagogy adoption drivers. Autonomy is essential for the ignition of intrinsic motivation; the organizational climate provides the structural scaffolding; and TPACK embodies the praxis within the classroom. Considering that this study is restricted to public secondary schools in one state in Nigeria, it is suggested that future study take the form of longitudinal and mixed methods study to address the issues of causation and context. In addition, future studies that incorporate border studies and comparative studies within the West African region, Nigeria and beyond, would be useful. Additionally, future studies could examine student performance as a mediating variable between the extent of teacher autonomy and the effectiveness of digital instruction. To ensure effective implementation of TMI in the educational system of Rivers State and similar contexts, it is suggested that TMI enhance teacher autonomy in terms of structuring and provide a socially supportive system for teachers. To strengthen technology-mediated instruction (TMI) in Rivers State secondary schools, the following policy actions are recommended: Decentralize instructional decision-making to empower teachers with curriculum and digital tool flexibility (SDG 4.1, 4.c); Develop a State Digital Education Framework integrating autonomy-supportive policies (SDG 4 & 9).

Conflicts of Interest

The author declares no conflict of interest.

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Author contribution

Eboh Rhoda Nkemdilim: Conceptualization, Formal analysis, Literature review and synthesis; **Chidinma Esther Ogbonnaya-Ngwu:** Policy document analysis, Framework development; **Rowland Chimezunum Chukwu:** Writing – original draft, Writing–review and editing.

Declaration of generative AI in scientific writing

During the preparation of this work, the author(s) used QuillBot in order to improve the language, readability, and grammatical structure of the manuscript. After using this tool/service, the author(s) reviewed and edited the content as necessary and took full responsibility for the content of the publication.

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