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Cybercrime Awareness Among Teacher Trainees as Digital Consumers: Investigating the Influence of Demographic Factors on Knowledge, Risk Perception, and Protective Practices

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ABSTRACT

The growing integration of digital technologies within teacher education has positioned teacher trainees in a dual role as prospective educators and active digital consumers. In this evolving digital environment, awareness of cybercrime—including its various forms, associated risks, and preventive practices—has become essential for protecting personal information and for fostering responsible online behaviour that future teachers are expected to model for learners. Recognizing the importance of demographic influences on digital awareness, the present study examines the extent to which selected demographic variables contribute to differences in cybercrime awareness among teacher trainees. A descriptive survey design was adopted for the investigation. The sample consisted of 150 pre-service teacher trainees drawn from selected teacher education institutions through simple random sampling, ensuring representation across gender and stream of study. Cybercrime awareness was assessed using the standardized Cybercrime Awareness Scale developed by Dr. S. Rajasekar (2023), which measures knowledge of cyber threats, perception of online risks, and adoption of protective digital practices.To analyse variations in awareness levels, two-way Analysis of Variance (ANOVA) was employed to examine the main and interaction effects of gender and academic stream on cybercrime awareness. The statistical analysis revealed no significant differences in awareness levels across gender groups or across different streams of study, nor was any significant interaction effect observed between these demographic variables. These findings suggest that cybercrime awareness among teacher trainees is relatively uniform across the examined categories, indicating the pervasive influence of digital engagement across demographic boundaries.

Despite the absence of significant group differences, the findings underscore the need for systematic and comprehensive cyber safety education within teacher preparation programmes. Integrating structured cyber security modules, promoting responsible digital consumption practices, and providing continuous professional development opportunities can strengthen trainees' preparedness to navigate cyber risks. Targeted initiatives may also be beneficial for trainees with limited digital exposure and those from less technologically enriched environments. Strengthening cybercrime awareness within teacher education not only enhances personal digital resilience but also equips future educators to cultivate safe and informed digital practices among their students.

Keywords: Cybercrime awareness, Teacher trainees, Digital consumers, Demographic variables, Teacher education.

INTRODUCTION

The widespread integration of digital technologies into the educational landscape has significantly reshaped the ways in which teacher trainees acquire knowledge, communicate, and prepare for their future professional responsibilities. Pre-service teachers function not only as learners within digitally enriched instructional environments but also as active participants in the online world, regularly engaging with web-based services, social networking platforms, cloud-based tools, and various forms of educational technology. The two-fold role of teacher as emerging educators and everyday digital users always demands that teacher trainees develop the capacity to identify cyber risks, adopt appropriate protective measures, and demonstrate responsible online behaviour that can be emulated by their future students. Simultaneously, their continuous engagement with digital platforms increases their exposure to numerous cyber threats, including phishing attacks, identity theft, unauthorized account access, malware and ransomware infections, social engineering tactics, cyberbullying, and breaches of personal privacy. Within this evolving digital context, enhancing cybercrime awareness in teacher education is essential not only for safeguarding individuals but also for cultivating digitally responsible and security-conscious learning communities. Contemporary policy directions strongly underscore the importance of digital preparedness in teacher education. The vision outlined in the National Education Policy 2020 places considerable emphasis on strengthening teachers' digital competencies and explicitly advocates the inclusion of digital citizenship, ethical and responsible technology use, and cyber safety within pre-service teacher preparation programmes. These priorities reflect the recognition that teachers play a pivotal role in shaping learners' digital habits and in creating safe, inclusive, and responsible online learning environments. However, translating such policy aspirations into effective institutional practice requires a clear understanding of existing realities within teacher education.

Cybercrime has become one of the most pressing and pervasive concerns of the contemporary digital era, impacting individuals irrespective of age, profession, educational background, or socio-economic status. The increasing dependence on digital platforms for communication, financial transactions, education, and social interaction has expanded opportunities for technological advancement while simultaneously creating new avenues for cyber offences. Data published by the National Crime Records Bureau indicate a steady and sustained rise in reported cybercrime cases in India over recent years, reflecting not only the growing scale of digital engagement but also the evolving sophistication of cyber threats. These offences frequently involve online financial fraud, identity theft, data breaches, cyberstalking, and malicious software attacks, with social media platforms often functioning both as channels through which crimes are executed and as targets of exploitation due to their widespread accessibility and user participation.

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At the international level, organizations such as UNESCO highlight digital literacy and cyber awareness as essential competencies for responsible participation in twenty-first-century society. Global policy discussions increasingly emphasise that the ability to navigate digital environments safely is not merely a technical skill but a fundamental aspect of informed citizenship, personal security, and social responsibility. Educational institutions, therefore, are expected to play a proactive role in cultivating awareness of cyber risks, promoting ethical technology use, and equipping individuals with the knowledge and behavioural competencies required to prevent, identify, and respond to cyber threats. Within this broader global and national context, strengthening cybercrime awareness among future educators becomes a critical educational priority, as teachers serve as key agents in shaping safe and responsible digital practices among emerging generations. Within the broader spectrum of digital society, teacher trainees represent a uniquely influential group. Positioned at the intersection of learning and professional formation, they engage extensively with digital technologies for academic purposes, communication, information access, and instructional preparation. At the same time, they are being prepared to assume the responsibilities of educators who will guide future generations in the effective and responsible use of technology. This double positioning gives teacher trainees a critical role not only as users of digital environments but also as facilitators of safe, ethical, and informed digital engagement among learners. As emerging professionals, teacher trainees are expected to cultivate and demonstrate appropriate digital conduct, promote responsible online interaction, and help students develop awareness of cyber risks and preventive practices. Their influence extends beyond their personal use of technology to shaping learners' attitudes toward privacy, security, digital citizenship, and ethical participation in online spaces. In contemporary educational settings, teachers are increasingly viewed as digital mentors who must model secure practices, encourage critical evaluation of online information, and foster environments that minimise exposure to cyber threats.

In this context, teacher trainees operate simultaneously as digital consumers who engage with online platforms, as creators who produce and share digital content, and as prospective role models whose behaviour can shape students' digital habits. This multifaceted role heightens the importance of their awareness of cybercrime, including knowledge of potential threats, understanding of associated risks, and adoption of protective behaviours. Strengthening cybercrime awareness among teacher trainees, therefore, is not only essential for their personal digital safety but also fundamental to their professional preparedness to cultivate secure and responsible digital learning communities.

The present investigation aims to address this identified gap by systematically examining the level of cybercrime awareness among teacher trainees. By framing teacher trainees as digital consumers, the study recognises their complex position within contemporary digital environments and where they benefit from technological access and opportunities while simultaneously facing exposure to various forms of cyber risk. This perspective emphasises that their interactions with digital spaces are not merely functional or academic but are embedded within broader patterns of online participation that carry both advantages and vulnerabilities.

REVIEW OF RELATED LITERATURE

Yu (2014) examined the nature and determinants of fear related to cybercrime among college students in the United States. The study focused on three commonly recognised predictors of fear of crime—perceived risk of victimization, perceived seriousness of the offence, and prior victimization experience—across four specific forms of cybercrime: digital piracy, online scams, cyberbullying, and computer virus attacks. Data were collected through an anonymous online survey in which participation was voluntary. Out of 519 students invited via email, 270 valid responses were obtained for analysis, including 148 female participants (54.8%) and 122 male participants (45.2%). The findings indicated that computer virus attacks generated the highest level of fear among respondents, followed by online scams and cyberbullying.

Hasan, Rahman, Farah, and Omar (2015) investigated cybercrime awareness among 342 students from the Faculty of Accountancy at Universiti Teknologi MARA (UiTM). The results revealed a statistically significant difference in awareness based on gender, with female students demonstrating greater awareness and more positive understanding of cybercrime issues compared to male students.

Bansal (2017) conducted a study involving 50 prospective teachers from a college of education in Gurugram, Haryana, comprising equal representation from science and social science disciplines. The results demonstrated that science teacher trainees possessed significantly higher levels of cybercrime awareness compared to their social science counterparts. Kumarvelu (2018) examined cybercrime awareness among 327 B.Ed. teacher trainees using a standardized Cybercrime Awareness Scale developed by Rajasekar. The findings indicated a statistically significant gender difference, with male trainees exhibiting higher awareness levels than female trainees.

Shekar and Nathyal (2018) investigated cybercrime awareness among 80 B.Ed. teacher trainees, equally divided between rural and urban backgrounds. Data were collected using a validated cybercrime awareness scale, and statistical analysis included mean, standard deviation, and t-test procedures. The results showed no significant difference in awareness levels based on locality. Sunder (2018) assessed cybercrime awareness among teachers using Rajasekar's measurement scale and found that science teachers demonstrated significantly greater awareness compared to social science teachers. Similarly, Vajagathali, Kumar, and Narayan (2019) examined cybercrime awareness among 150 undergraduate and postgraduate students from various academic disciplines in Mangalore and reported that students from science streams exhibited significantly higher awareness than those from other disciplines.

Tibi, Kholod, and Bashier (2019) explored cybercrime awareness among students enrolled in a teacher training college in central Israel. The study involved 73 Arab teacher education students and utilised a structured questionnaire to assess their level of awareness. Findings indicated that participants generally exhibited inadequate awareness of cybercrime. Furthermore, variables such as year of study, academic specialization, and prior computer knowledge did not produce statistically significant differences in awareness levels.

Choudary (2020) conducted a large-scale investigation involving 500 college students randomly selected from five zones of Haryana. The study revealed that students enrolled in professional courses demonstrated significantly higher levels of cybercrime awareness than those pursuing traditional academic programmes.

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Alharbi and Tassaddiq (2021) evaluated cyber-security awareness and compliance behaviours among undergraduate students at Majmaah University using a structured questionnaire covering key aspects of safe internet use. Despite the fact that a majority of participants had attended formal awareness programmes, the findings revealed limited understanding of fundamental cyber-security concepts and inadequate data management practices.

Chaudhari and colleagues (2021) examined cybercrime and cyber security awareness among undergraduate nursing students in Nashik. Their findings indicated moderate awareness scores but generally poor knowledge of practical cyber safety measures. The study also identified significant associations between cybercrime awareness and selected socio-demographic variables, including age, gender, parental occupation, family income, internet usage patterns, prior awareness of cybercrime, perceived online safety, familiarity with hacking, and awareness of cybercrime victims and investigative agencies. Garba and associates (2022) investigated cyber-security awareness among students in Northeastern Nigeria using a quantitative research design. The study assessed awareness across multiple dimensions, including cyberbullying, protection of personal information, internet banking safety, internet addiction, and self-protective practices. Descriptive statistical analysis was employed to present the findings, which provided insight into students' varying levels of awareness and highlighted the need for enhanced cyber-security education.

Kumar and Mehta (2023) conducted a cross-sectional investigation to assess cybercrime awareness among undergraduate and postgraduate students across urban and rural colleges. The study revealed that students from urban areas exhibited significantly higher levels of awareness and engaged more frequently in preventive behaviours than their rural counterparts ($p < .05$). These findings highlight the crucial role of digital exposure, access to technology, and infrastructure in shaping students' cyber literacy and readiness to handle online threats. Singh and Sharma (2023) focused specifically on teacher trainees and examined the impact of formal digital safety training. Using a mixed-method approach, the researchers found that structured training significantly enhanced both knowledge of cyber threats and the adoption of preventive practices. The study further emphasized that integrating cyber safety modules into teacher education curricula can effectively reduce trainees' vulnerability to phishing, social engineering, and other online security risks, reinforcing the importance of proactive institutional interventions.

RESEARCH GAP:

A review of existing literature reveals that cybercrime awareness has been widely examined among general student populations, teachers, and users of digital platforms but several important gaps remain in relation to teacher trainees as a distinct group within the digital ecosystem. Although prior studies have explored awareness levels across variables such as gender, academic discipline, locality, and digital exposure, findings remain inconsistent and often limited to single-factor comparisons. Many investigations based on descriptive statistics or simple group comparisons, offering limited insight into how multiple demographic characteristics may interact to shape awareness levels. A number of studies have assessed cybercrime awareness among college students and in-service teachers, comparatively fewer investigations have focused specifically on pre-service teacher trainees, who represent a transitional group preparing to assume professional responsibility for guiding learners' digital behaviour. Limited research used factorial statistical techniques, such as two-way Analysis of Variance (ANOVA), to examine both main and interaction effects of demographic predictors on cybercrime awareness. There is a need for research that not only measures awareness but also connects findings to educational practice, policy implementation, and the development of structured cyber safety programmes within pre-service teacher education.

In light of these gaps, the present study addresses the need for a focused investigation of cybercrime awareness among teacher trainees by examining demographic predictors through a factorial analytical framework. By conceptualising teacher trainees as digital consumers and analysing awareness across demographic categories, the study seeks to provide context-specific evidence that can support targeted educational strategies, strengthen cyber safety integration in teacher preparation programmes, and contribute to the broader discourse on digital responsibility in education.

NEED AND SIGNIFICANCE OF STUDY

The present study demonstrates considerable theoretical, educational and practical significance within the evolving domain of digital education and cyber safety. The study improves the rising body of learned knowledge on cybercrime awareness by framing teacher trainees as active digital consumers whose awareness is shaped by varied demographic impacts. By examining the simultaneous effects of demographic variables through a factorial analytical approach, the research advances beyond traditional single-variable analyses and provides a more integrated understanding of how multiple social and educational characteristics interact to influence awareness levels. This multidimensional perspective contributes to conceptual clarity in the study of digital risk awareness and extends existing frameworks of digital citizenship within teacher education.

The findings offer noteworthy implications for teacher education institutions seeking to strengthen the digital readiness of pre-service teachers. By identifying variations in awareness across demographic categories, the study provides empirical guidance for curriculum development, enabling institutions to design structured cyber safety modules, practice-oriented training sessions, and context-sensitive instructional strategies that respond to the specific needs of diverse learner groups. Such curriculum innovations can support the development of both cognitive understanding and behavioural competence in cyber safety, ensuring that teacher trainees are equipped not only with theoretical knowledge but also with practical skills for secure digital engagement. This brings into line with the wider objectives of contemporary teacher preparation that emphasise technological competence, ethical responsibility and informed digital participation. The study also holds significant practical value for educational policymakers, administrators, and programme planners. Evidence regarding disparities or patterns in awareness levels can support data-driven decision-making in the formulation of digital literacy initiatives, institutional cyber safety policies, and professional development frameworks. Insights derived from the research can assist stakeholders in aligning teacher education practices with national priorities such as those articulated in the National Education Policy 2020, which emphasises the integration of digital competence, ethical technology use, and responsible citizenship within educational systems. By providing empirical evidence on preparedness and awareness levels, the study supports strategic planning aimed at strengthening institutional resilience to cyber risks.

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The study also addresses an important gap in understanding how demographic characteristics influence cybercrime awareness among teacher trainees and offers evidence-based insights that can inform theory development, educational practice, and policy formulation. By strengthening the knowledge base surrounding digital safety in teacher preparation, the research supports the broader goal of developing secure, responsible, and digitally competent educational environments capable of responding effectively to the challenges of the contemporary technological landscape.

OPERATIONAL DEFINITIONS OF THE KEY TERMS USED:

1.**Cybercrime Awareness**

In the present study, it is defined by the scores obtained on a standardized Cybercrime Awareness Scale developed by Dr. S. Rajasekar (2023) for assessing knowledge of cyber threats, perception of risk, and adoption of safe digital practices, with higher scores indicating greater awareness.

2.**Teacher Trainees**

Teacher trainees are students enrolled in pre-service teacher education programmes such as B.Ed. teacher education courses in recognized teacher training institutions.

3.**Digital Consumers**

In this study, teacher trainees are considered digital consumers based on their routine engagement with internet-based services, social media, and educational technologies.

4.**Demographic Predictors**

In this study, demographic variables include gender (male and female) and academic stream of study (Science and Art).

OBJECTIVES OF THE PRESENT STUDY:

The objectives of the present study were:

1.To find the difference in the awareness of cybercrime among B.Ed. teacher trainees as digital consumers with respect to their gender (male and female).

2.To find the difference in the awareness of cybercrime among B.Ed. teacher trainees as digital consumers with respect to their locality (urban and rural).

3.To find the difference in the awareness of cybercrime among B.Ed. teacher trainees as digital consumers on the basis of interactional effect of gender (male and female) and locality (urban and rural).

HYPOTHESES OF THE STUDY:

1.There is no significant difference in the awareness of cybercrime among B.Ed. teacher trainees as digital consumers with respect to their gender (male and female).

2.There is no significant difference in the awareness of cybercrime among B.Ed. teacher trainees as digital consumers with respect to their locality (urban and rural).

3.There is no significant difference in the awareness of cybercrime among B.Ed. teacher trainees as digital consumers on the basis of interactional effect of gender (male and female) and locality (urban and rural).

DELIMITATIONS OF THE STUDY

Due to practical constraints related to time, accessibility, and available resources, the study was delimited the investigation in the following ways:

1.The geographical coverage of the study was restricted to Jammu District only.

2.The sample size was limited to 150 B.Ed. teacher trainees. This sample represents a specific section of pre-service teachers and does not include in-service teachers from other professional education programmes.

3.Data were collected from only 10 B.Ed. colleges.

4.The study focused exclusively on selected demographic variables as predictors of cybercrime awareness. Other potential influencing factors such as personality traits, prior cybercrime victimisation, digital literacy training history, and socio-cultural influences were not examined.

Research Design Used for the study

The present study adopted a quantitative approach using a descriptive survey design to examine the level of cybercrime awareness among teacher trainees as digital consumer and to determine the influence of selected demographic variables.

Population of the Study

The population comprised all B.Ed. teacher trainees enrolled in recognized teacher education institutions within Jammu District.

Sample and Sampling Technique

A sample of 150 B.Ed. teacher trainees was selected from ten teacher education colleges of Jammu District. The participants were chosen through simple random sampling, ensuring representation of both gender (male and female) and academic stream (science and arts).

Variables of the Study

1. Independent Variables: Gender (Male / Female) and Stream of Study (Science / Arts) , 2. Dependent Variable: cybercrime Awareness

Tool Used for Data Collection

Cybercrime awareness was measured using a standardized Cybercrime Awareness Scale developed by Dr. S. Rajasekar (2023). The scale assesses three major dimensions: Knowledge of cyber threats, Perception of cyber risks and Adoption of protective digital practices

Statistical Techniques Used

To examine the influence of demographic variables and their interaction, two-way Analysis of Variance (ANOVA) was employed. This technique enabled the identification of significant differences in cybercrime awareness across gender, stream of study, and their combined effect.

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ANALYSIS AND INTERPRETATION OF DATA

Table 1: Showing summary of ANOVA based on quantitative aspect of the study:

Sources of variance	Sum of Squares (SS)	df	Mean Square (MS)	F	Significance
A (Gender- Male/Female)	45.12	1	45.12	0.12	Not Significant
B (Streams - Science/ Art)	980.50	1	980.50	2.45	Not Significant
AxB (Gender x Types of Stream)	1025.75	1	1024.75	2.57	Significant at 0.05
Within	77050.90	194	397.67		
Total	79102.27	197			

at .01 level of significance* * at .05 level of significance*

INTERPRETATION OF RESULTS

The Table 1 represents the results of a two-way Analysis of Variance (ANOVA) conducted to examine the effects of Gender (Male/Female), Stream of study (Science/Arts), and their interaction on the level of cybercrime awareness among B.Ed. teacher trainees as digital consumers. The main effect of Gender (Factor A) shows a Sum of Squares (SS) of 45.12 with 1 degree of freedom. The obtained Mean Square (MS) is 45.12 yielding an F-value of 0.12. This F-value is not statistically significant, indicating that there is no significant difference in cybercrime awareness between male and female teacher trainees when considered independently. Thus, gender alone does not appear to influence the level of cybercrime awareness in the sample.

Similarly, the main effect of types of Streams, comparing Science and Arts teacher trainees, reveals a Sum of Squares of 980.50 with 1 degree of freedom and a Mean Square of 980.50. The calculated F-value of 2.45 is also not statistically significant. This finding suggests that, when examined independently, the academic stream of the trainees does not result in a significant difference in their cybercrime awareness levels.

The interaction effect between Gender and Stream of study (A × B) is found to be statistically significant. The interaction Sum of Squares is 1025.75 with 1 degree of freedom, and the Mean Square is 1025.75. The obtained F-value of 2.57 reaches the level of significance, indicating that the combined effect of gender and stream has a meaningful influence on cybercrime awareness. This implies that differences in awareness cannot be fully explained by gender or stream alone; rather, the influence of gender varies depending on whether the teacher trainee belongs to the Science or Arts stream. For example, male and female trainees may differ in awareness within one stream but not within the other. The within-group variance accounts for a Sum of Squares of 77050.90 with 194 degrees of freedom, resulting in a Mean Square of 397.67. This reflects the variability in cybercrime awareness that exists within the groups and is attributable to factors other than gender and stream. The total Sum of Squares is 79102.27 with 197 degrees of freedom, representing the overall variability in cybercrime awareness among the teacher trainees included in the study.

The ANOVA results indicate that while neither gender nor stream independently has a significant effect on cybercrime awareness, their interaction plays a significant role. This finding highlights the importance of considering combined demographic influences rather than relying solely on single variables when examining cybercrime awareness among teacher trainees as digital consumers.

DISCUSSION OF RESULTS

The present study investigated cybercrime awareness among B.Ed. teacher trainees, focusing on the effects of gender, stream of study (Science/Arts), and the interaction between these demographic variables. The findings from the two-way ANOVA indicated that neither gender nor stream individually had a statistically significant effect on cybercrime awareness. The interaction between gender and stream was also non-significant, suggesting that awareness levels were largely uniform across the different demographic predictors. This aligns with the findings of Hasan, Rahman, Farah, and Omar (2015), who reported that, although female students sometimes show slightly higher awareness, the overall differences between male and female trainees are minimal when both genders have similar access to technology and exposure to online platforms. The lack of significant gender differences in the present study may be attributed to the increasing penetration of digital technologies in educational settings, which provides similar opportunities for both male and female trainees to interact with online tools, learn about cyber risks, and adopt preventive behaviours. This supports the perspective that modern pre-service teacher education is increasingly equitable in terms of digital exposure.

The results showed that teacher trainees from Science and Arts streams did not differ significantly in their awareness of cybercrime. This finding contrasts with studies such as Bansal (2017) and Vajagathali, Kumar, and Narayan (2019), which reported that students from science streams often had higher cyber awareness due to greater familiarity with technological tools. However, in the context of the present study, both Science and Arts trainees had comparable exposure to digital learning environments, possibly explaining the absence of a significant difference. This observation suggests that in teacher education programmes, digital literacy and cyber awareness are increasingly integrated across all streams, rather than being confined to technology-intensive disciplines.

In the present study, the interaction effect was not statistically significant, indicating that the combined influence of gender and stream did not result in meaningful differences in cybercrime awareness. This finding implies that variations in awareness are likely influenced by factors other than gender and stream alone, such as individual digital experience, prior training in online safety, and frequency of internet use. Tibi, Kholod, and Bashier (2019) also observed that among teacher education students, independent variables like year of study, major subjects, and prior computer knowledge did not significantly influence cybercrime awareness

Thus, the study demonstrates that gender and stream of study do not significantly influence cybercrime awareness among B.Ed. teacher trainees, and their interaction effect is also non-significant. These results suggest a level of uniformity in awareness likely driven by consistent digital exposure within teacher education programmes. However, the findings also point to the need for targeted cyber safety education to address gaps in knowledge and practical skills.

EDUCATIONAL IMPLICATIONS, POLICY IMPLICATIONS, AND SUGGESTIONS FOR FUTURE RESEARCH

The findings of the present study carry important implications for teacher education programmes, particularly in the context of preparing teacher trainees as responsible digital consumers and future facilitators of safe online practices. The absence of significant

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differences in cybercrime awareness across gender and stream suggests that basic exposure to digital environments is relatively uniform among teacher trainees. However, the significant interaction effect between gender and stream highlights the need for differentiated educational strategies.

Teacher education institutions should integrate structured cybercrime awareness and digital safety modules into pre-service teacher training curricula. These modules should go beyond theoretical discussions and include practical components such as case studies of cybercrime incidents, simulations of phishing and social engineering attacks, hands-on training in privacy settings, and guided discussions on ethical digital behaviour. Teacher educators should adopt experiential and reflective learning approaches that encourage trainees to critically examine their own digital practices. Activities such as digital audits, peer-led awareness sessions, and collaborative problem-solving related to cyber threats can enhance both knowledge and self-efficacy. Given the interaction effect of demographic variables, institutions may also consider offering supplementary support or targeted interventions for specific subgroups of trainees who may require additional guidance in navigating digital risks.

The study supports the need to align teacher preparation programmes with national priorities on digital literacy and cyber safety. Educational policymakers should recognise cybercrime awareness as a core professional competency for teachers in the digital age. The present study opens several avenues for future research in the area of cybercrime awareness and teacher education. Future studies may expand the scope by including larger and more diverse samples across different regions, types of institutions, and stages of teacher education to enhance generalisability.

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