

The Role of Digital Footprints in Influencing the Online Behavior of Prospective Teachers

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Abstract—This study explored prospective teachers' digital footprint awareness, behavioral practices, and overall digital footprint management (TFMI), with a focus on gender differences and the relationship between awareness and behavior. A mixed-method approach was used, combining quantitative data from 40 participants with qualitative insights from interviews with 15 participants. The quantitative results showed that Behavior scores (M = 76.65) were higher than Awareness scores (M = 63.48), indicating that prospective teachers tend to follow safe digital practices more than they actually understand them. TFMI showed the greatest variability, reflecting differences in how Prospective Teachers manage their digital presence. No significant gender differences were found between male and female prospective teachers ($p > .05$), and the relationship between Awareness and Behavior was positive but weak and not statistically significant ($r = .26$, $p = .098$). The qualitative findings supported these results by showing that Prospective Teachers generally have only a basic and surface-level understanding of digital footprints, and their behaviors are often shaped by habits, peer influence, and informal learning rather than clear conceptual knowledge. Many participants also underestimated the risks associated with their digital activities and showed inconsistencies in managing their online presence. Overall, the study highlights that awareness alone is not enough, and there is a strong need for practical, skill-based digital literacy training in teacher education.

Index Terms—Digital footprint, Awareness, Behavior, Digital Footprint Management Index (TFMI), Digital literacy, Active Footprints, Passive Footprints

I. INTRODUCTION

In today's digitally driven society, individuals continuously leave traces of their online activities, known as digital footprints. These traces, which include search histories, using social media, visiting websites, online purchases, and learning platform activities, have

become an inevitable aspect of contemporary life (Rakow et al., 2023). For Prospective Teachers in higher education, especially those in teacher education programs, digital footprints represent not only records of personal behavior but also indicators of academic engagement, professional readiness, and social identity in an increasingly networked world (Kumar, 2020; Shafiq et al., 2025). The rise of Web 2.0 technologies and digital platforms has transformed the way students interact, learn, and present themselves online. As future educators, Prospective Teachers are expected to exhibit responsible digital citizenship, awareness of privacy concerns, and professional conduct in their online engagements. Their digital behaviors are often shaped by their understanding- or lack thereof- of how digital footprints influence personal reputation, employability, and academic outcomes (Martin et al., 2019; Snyder, 2016). Consequently, studying the role of digital footprints in influencing the online behavior of prospective teachers is both timely and significant. What are digital footprints? Digital footprints are the set of digital trails left by interaction in digital environment. It includes your data, action and services during the digital usage.

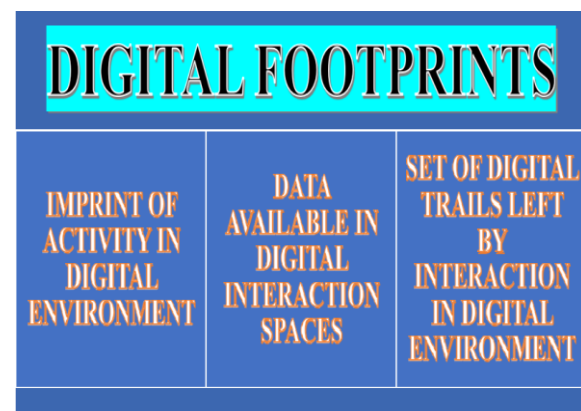


Figure 1- Concept of Digital Footprints

Types of digital footprints:

1. Active Footprints
2. Passive Footprints

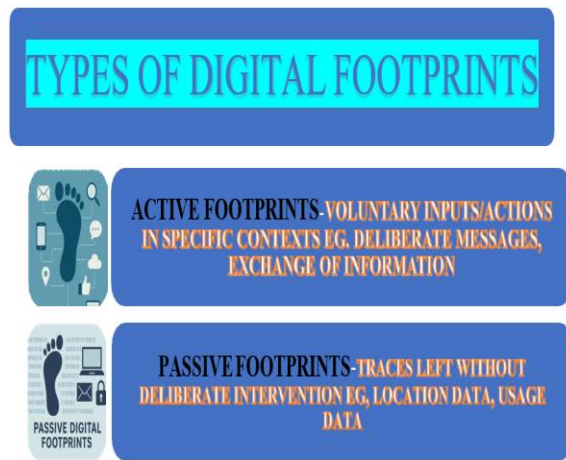


Figure-2 Types of Digital Footprint

II. BACKGROUND OF THE STUDY

The concept of a digital footprint can be broadly divided into two categories: active footprints and passive footprints. Active digital footprints include information you purposely share online, like posts, blogs, or comments. Passive digital footprints are the data collected automatically in the background, such as your IP address, cookies, or browsing history (Soni, 2024). Both types collectively contribute to an individual's online identity. For students, these footprints carry long-term consequences. A simple social media post or repeatedly viewing inappropriate content can impact a person's online image and overall digital behavior and not only their academic integrity but also their employability in the teaching profession. Educational institutions and employers increasingly screen candidates' digital presence as part of professional evaluations (Verma & George, 2023).

In India, where teacher education is undergoing significant reform under the National Education Policy (NEP) 2020, digital literacy and ethical online engagement are emphasized as critical competencies for future teachers (Suresh & Joseph, 2025). Prospective Teachers stand between their personal use of digital platforms and the professional standards they are expected to follow in the digital world. Their digital footprints, shaped by their awareness and choices, influence their online behavior—ranging

from how they engage in academic platforms like Moodle and Google Classroom to how they represent themselves on social media. Despite the increasing reliance on digital technologies in education, many prospective teachers lack adequate awareness about digital footprints and their implications (Chithra et al., 2018; Sharma & Nair, 2023). Studies suggest that even though prospective teachers are adept at using digital platforms for communication and entertainment, they often underestimate the permanence and visibility of their digital traces (Soni, 2024). This lack of awareness can manifest in problematic online behaviors such as oversharing, cyber incivility, plagiarism, or unprofessional digital self-presentation. Moreover, digital footprints extend beyond personal reputation; they also influence learning outcomes. For example, Shafiq et al. (2025) demonstrated that analysis of digital traces in learning management systems correlates strongly with academic performance. If prospective teachers are not mindful of their digital footprints in academic contexts, they risk misrepresenting their engagement and commitment to learning. So, the main issue is that future teachers do not fully understand what digital footprints are and how these footprints influence their academic and personal online behavior. This study is important for many reasons. First, it adds to the research on digital citizenship by focusing on a specific group prospective teachers who will soon become teachers and role models for future learners. Teachers are increasingly expected to guide students in responsible online practices; hence, their own awareness and behavior are of paramount importance (Martin et al., 2019; Snyder, 2016).

Second, the study addresses a gap in the existing literature, which has largely concentrated on undergraduate students, adolescents, or general higher education populations, with limited attention to pre-service teacher education (Evcimen et al., 2025; Suresh & Joseph, 2025). Investigating how digital footprints influence the online behavior of prospective teachers provides, these insights are useful for creating and improving the curriculum in teacher education programs. Lastly, this study offers useful guidance for both educational policies and teaching practices. By highlighting the relationship between digital footprints and online behaviors, it can inform training programs on digital literacy, digital ethics, and responsible online engagement within teaching courses curricula.

Such interventions can foster self-regulation, professionalism, and critical digital awareness among pre-service teachers, ensuring they become competent digital role models in their future classrooms. Digital footprints are powerful determinants of online behavior in the digital age. For Prospective teachers, who are preparing to enter the teaching profession, understanding and managing the digital footprints are important to study because they affect students' academic success, professional reputation, and ethical behavior. By examining how digital footprints affect online behavior, this study highlights an important and current issue that has major effects on education, policy, and real-world teaching practices.

III. SIGNIFICANCE OF THE STUDY

The significance of this research extends to multiple stakeholders. For Prospective Teachers, it helps us understand how a person's online actions shape their digital identity and professional growth. For teacher educators, it offers a useful guide to include lessons on safe, responsible, and ethical online behavior in their teaching. For policymakers, the findings can inform guidelines and best practices for digital competence in teacher education programs. Importantly, the study aligns with broader educational goals, this aligns with the NEP 2020, which highlights the importance of being confident and skilled in using digital tools and responsible online conduct as essential skills for 21st-century educators. By investigating digital footprints, the study connects theory with real-life practice and gives practical suggestions that can be used directly in developing responsible digital citizens within the teaching profession (Suresh & Joseph, 2022).

It is established that higher education students possess high digital footprint awareness but exhibit low experience, with awareness levels varying significantly across demographic factors like age, class level, and perceived self-sufficiency in using online tools. However, there is a clear lack of research that studies in research examining how digital footprint awareness and experiences vary among students across specific educational divisions (e.g., university departments or types of high schools) and confirming that Higher Education Institutions (HEIs) provide adequate information to students about how Virtual Learning Environment (VLE) data is being used. This knowledge matters because it is crucial for developing

targeted educational interventions, promoting student autonomy over their data, and ensuring that institutional policies support student mental wellbeing and address concerns about surveillance and privacy in digital learning environment.

IV. RESEARCH QUESTIONS

The following are the research questions -

1. What is the extent of Prospective Teachers awareness of digital footprints?
2. In what ways do digital footprints influence their online behaviors with reference to gender?

V. OBJECTIVES

The central aim of this research is to explore how digital footprints influence the online behavior of Prospective Teachers. Specifically, the study seeks:

1. To Assess the awareness of prospective teachers regarding their digital footprints.
2. To examine the relationship between digital awareness and online behavior with reference to Gender.

VI. METHODOLOGY

This study uses a detailed research design with a quantitative approach to understand how digital footprints affect the online behavior of prospective teachers. The quantitative component employs a survey-based design to measure awareness levels, behavioral patterns, and risks associated with digital footprints. The study is exploratory-descriptive in nature. While previous research has investigated digital footprint awareness in higher education (Chithra et al., 2018; Rakow et al., 2023), there remains a gap in understanding how these footprints specifically shape the online behaviors of pre-service teachers in the Indian context. The population for this study includes Prospective Teachers pursuing their teacher training program in University of Lucknow, Uttar Pradesh. These prospective teachers were selected because they are future teachers, and their online behavior will affect not only their professional image but also how well they can teach their students to use the internet safely and responsibly. To ensure diversity and representativeness, the study employs purposive sampling.

A two-stage sampling approach is applied:

1. Quantitative survey sample: 40 prospective teachers enrolled in Lucknow University campus.
2. Qualitative focus group sample: 15 prospective teachers selected from the survey participants to ensure gender balance, variation in digital usage intensity, and academic backgrounds.

A self-administered questionnaire is the main tool used for collecting quantitative data. It is structured into four sections:

1. Demographics: Age, Gender, Internet access patterns.
2. Awareness of Digital Footprints: Items measuring knowledge of active vs. passive footprints, permanence of data, and potential consequences (adapted from Sharma & Nair, 2023).
3. Online Behavior: Frequency of online activities, types of platforms used (academic vs. social), self-regulation practices, and instances of oversharing or risky behavior (based on Rakow et al., 2023). Items are measured using a 5-point Likert scale ranging from “Strongly Disagree” to “Strongly Agree.” The questionnaire will be distributed offline (paper-based copies) to cater to students who have different levels of access to digital devices. Informed consent is obtained

prior to participation. Responses are anonymized and collected over a two-week period.

VII. RESULTS

Analysis of Quantitative data

The data revealed score distributions with a moderate spread and slight skewness, along with substantial overlap between male and female Prospective teachers in both the distributions and boxplots. Scatterplots further showed a gentle positive trend between Awareness and Behavior scores, although the points displayed considerable overlap, indicating only a modest relationship. Overall, Behavior scores tended to be higher than Awareness scores, while the TFMI demonstrated the greatest variability among prospective teachers. The dataset included prospective teachers assessed on three key measures: Awareness Score, Behavior Score, and the composite Digital Footprint Management Index (TFMI), with gender coded as Female = 1 and Male = 2. Descriptive statistics confirmed these patterns, showing that students generally reported stronger behavioral practices than conceptual awareness, and that TFMI values varied widely across the sample.

Table1: Descriptive Statistics for Awareness, Behavior and TFMI (N = 40)

Variable	Mean	Median	Mode	Std dev.	Min	Max	N
Awareness score	63.475	66.0	71.0	8.912	40.0	77.0	40.0
Behavior score	76.65	77.5	80.0	8.844	48.0	92.0	40.0
TFMI	140.125	143.5	151.0	15.265	93.0	161.0	40.0

Descriptive statistics confirmed these patterns, showing that prospective teachers generally reported stronger behavioral practices than conceptual awareness, and that TFMI values varied widely across the sample. For transparency and visual confirmation, distributions, group comparisons, and relationships are depicted in the figures below:

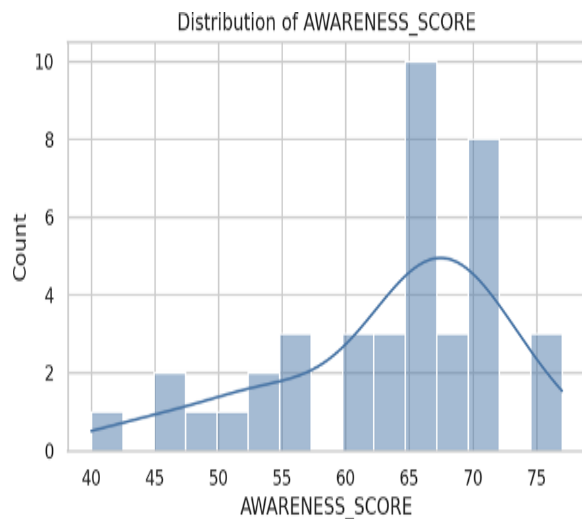


Figure-3

Descriptive statistics for Awareness Score

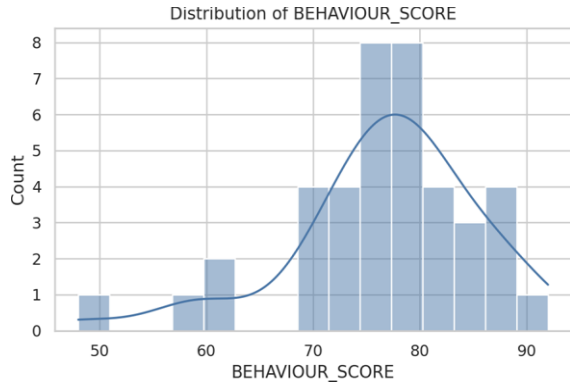


Figure-4

Descriptive statistics for Behavior Score

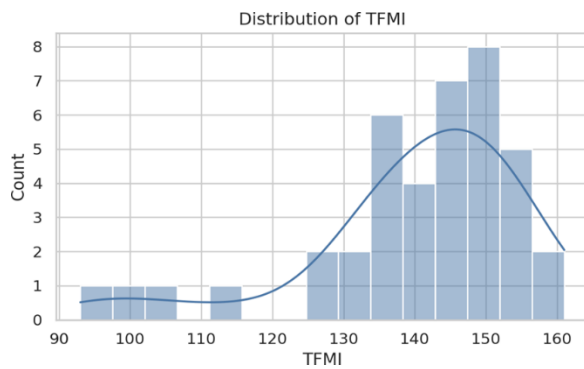


Figure-5

Descriptive statistics for TFMI

Descriptive analysis was conducted to examine overall patterns in prospective teacher’s digital footprint awareness, behavior, and the composite Digital Footprint Management Index (TFMI). Table 1 shows the basic statistics for all three variables. Behavior scores were higher on average ($M = 76.65$, $SD = 8.84$) compared to Awareness scores ($M = 63.48$, $SD = 8.91$), indicating stronger behavioral adherence relative to conceptual awareness among Prospective Teachers. TFMI showed the greatest variability ($M = 140.13$, $SD = 15.27$), suggesting heterogeneity in Prospective Teachers overall digital footprint management practices. Overall, the dataset indicated a moderate spread of scores with some skewness. Score patterns for all three variables demonstrated adequate variability, and visual inspection of histograms confirmed these characteristics. Hence, students show moderately high behavioral adherence relative to their awareness levels, and TFMI reflects broad dispersion, suggesting heterogeneous digital footprint management practices.

Gender-Based Group Difference

Group-wise descriptive statistics by gender are provided here:

Table 2: Group-wise Descriptive statistics by Gender

Gender	N	Awareness Score Mean	Awareness Score SD	Behavior Score Mean	Behavior score SD	TFMI Mean	TFMI SD
Female	23	64.260	7.411	76.826	9.437	141.086	14.878
Male	17	62.411	10.770	76.411	8.254	138.823	16.140

Table-2 shows Group-wise statistics were examined separately for female ($n = 23$) and male ($n = 17$) Prospective Teachers. Female prospective teachers showed a little more awareness ($M = 64.26$, $SD = 7.41$) compared to males ($M = 62.41$, $SD = 10.77$). Behavior scores were similar for females ($M = 76.83$, $SD = 9.44$) and males ($M = 76.41$, $SD = 8.25$). TFMI also showed comparable mean scores across gender (female: $M = 141.09$, $SD = 14.88$; male: $M = 138.82$, $SD = 16.14$). Normality diagnostics indicated violations in several subgroups; therefore, non-parametric Mann–Whitney U tests were used to measure gender differences. Results revealed that there was no meaningful statistical difference between male and female prospective teachers across Awareness, Behavior, or TFMI (all $p > .05$). These findings indicate broadly

comparable digital footprint profiles among genders in this cohort.

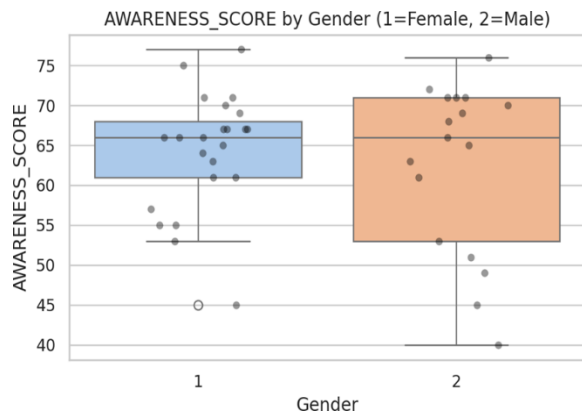


Figure-6

Boxplot for Awareness score

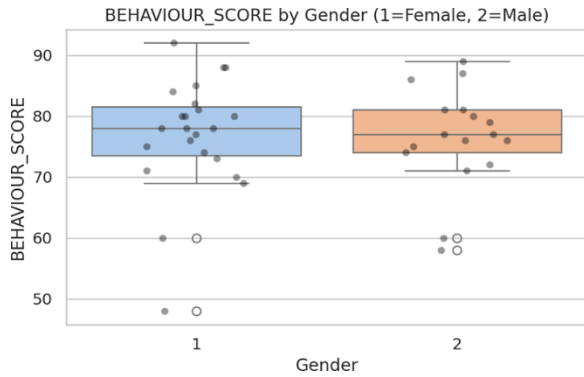


Figure-7
Boxplot for Behavior Score

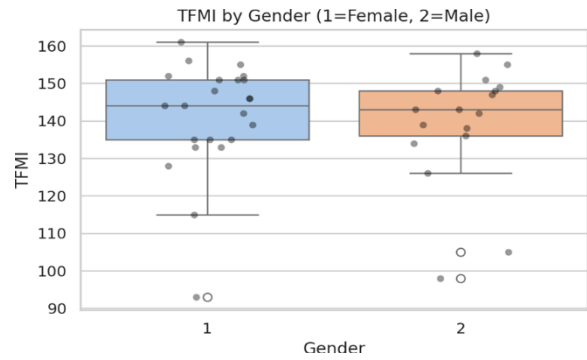


Figure 8
Boxplot for TFMI

Correlation Between Awareness and Behaviour
To test for gender differences, normality was examined and appropriate independent-sample tests were conducted. The results table is below:

Table 3: Gender-wise Normality Tests and Mann–Whitney U Test Results

SCORE	Shapiro– Wilk p (Female)	Shapiro– Wilk p (Male)	Statistical Test	U	p	N(Female)	N(Male)
Awareness score	0.2616	0.0408	Mann-WhitneyU	196.5	0.989	23	17
Behavior score	0.0390	0.1633	Mann-Whitney u	206.5	0.773	23	17
TFMI	0.0042	0.0068	Mann-Whitney u	211.0	0.6811	23	17

Note- p values for normality are based on the Shapiro–Wilk test. Due to violation of normality assumptions, the nonparametric Mann–Whitney U test was applied. TFMI = Total Footprint Management Index.

In all cases (Awareness, Behavior, TFMI), there was no meaningful statistical difference between male and female Prospective Teachers. This suggests broadly comparable digital footprint awareness, behavior, and composite management across genders in this sample.

Associations Between Awareness and Behaviour

Correlations between Awareness and Behavior were estimated overall and separately by gender, prioritizing robust non-parametric estimation where distributional assumptions were not met. Results are shown here:

Table 4: Spearman’s Rank-Order Correlation Results by Group

GROUP	METHOD	$r_{spearman}$	p	N
Overall	Spearman’s rho	0.264	0.098	40
Female	Spearman’s rho	0.369	0.082	23
Male	Spearman’s rho	0.230	0.374	17

Note- $r_{spearman}$ = Spearman’s rank-order correlation coefficient. N = sample size. Correlations

were tested using a two-tailed significance level. Spearman’s rank-order correlations were calculated to examine associations between Awareness and Behavior due to non-normality in score distributions. The overall correlation was positive but modest ($r_s = .26, p = .098, n = 40$). When examined by gender, correlations remained positive for both females ($r_s = .37, p = .082, n = 23$) and males ($r_s = .23, p = .374, n = 17$). Although none of these associations reached statistical significance, the direction of the relationships reveals that higher levels of awareness may relate to better behavioral practices, albeit weakly.

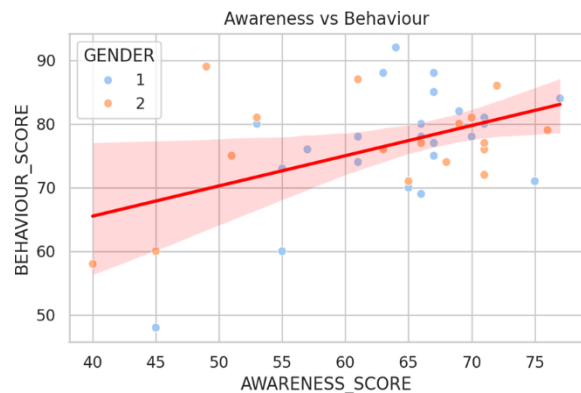


Figure-9

Correlation between Awareness and Behavior

Awareness and Behavior showed a small positive Correlation when awareness was higher, behavior also tended to be slightly better. However, this correlation was not strong enough to be considered statistically meaningful. The same trend was seen for both females and males. This suggests that greater awareness may be related to better behavior, but in this group the correlation is weak and not clear enough to draw firm conclusions. The figure show overlapping male–female distributions, modest positive scatter trends between Awareness and Behavior, and wider spread in TFMI. Figures depicting score distributions, gender-wise comparisons, and the Awareness–Behavior scatterplots supported the statistical results.

Male and female score distributions demonstrated substantial overlap, reinforcing the absence of gender differences. Scatterplots showed gentle positive trends between Awareness and Behavior but also revealed substantial dispersion, consistent with the modest correlation values observed.

Analysis of Qualitative data

Thematic Analysis of Interview Data

To gain deeper insights into Prospective Teachers awareness, behavioural practices, and digital footprint management, semi-structured interviews were conducted with 15 participants. The data were analysed using thematic analysis, leading to the identification of the following key themes are-

Theme 1: Partial and Surface-Level Awareness of Digital Footprints

Most participants demonstrated a basic understanding of digital footprints; however, their awareness was often limited to visible online activities such as social media posts. Prospective Teachers commonly associated digital footprints with “posts,” “photos,” and “comments.” Few participants were aware of passive data collection (e.g., cookies, tracking, metadata). Some participants expressed uncertainty about how long digital data persists online. This indicates that awareness exists but lacks depth, supporting the quantitative finding that awareness levels are comparatively lower than behavioural practices.

Theme 2: Behaviour Driven by Habit Rather than Conceptual Understanding

Participants reported engaging in safe digital practices,

but these behaviours were often habitual or externally guided rather than consciously informed. Many Prospective teachers reported using privacy settings and avoiding suspicious links. These practices were frequently learned through peers, institutional rules, or past negative experiences. Few participants could clearly explain why these behaviours are important. This aligns with the finding that behaviour scores exceed awareness scores, suggesting that actions are not always grounded in strong conceptual knowledge.

Theme 3: Inconsistent and Uneven Digital Footprint Management (TFMI Variability)

There was significant variation in how prospective Teachers managed their digital presence. Some participants actively monitored their online profiles, deleted old content, and curated their digital identity. Others rarely reviewed their online presence and were unaware of their digital visibility. A few participants expressed concern but lacked strategies to manage their footprint effectively. This theme reflects the high variability observed in TFMI scores, indicating unequal levels of digital management competence among prospective Teachers.

Theme 4: Low Perceived Risk and Optimistic Attitudes

Several participants underestimated the potential risks associated with digital footprints. Many believed that their online activity was “not important enough” to cause harm. Some assumed that privacy settings alone provide complete protection. There was limited awareness of long-term consequences (e.g., employability, digital reputation). Low perceived risk may explain the weak relationship between awareness and behaviour, as behaviour is not always driven by risk perception.

Theme 5: Influence of Peer Learning and Informal Sources

Prospective Teachers frequently relied on informal sources for learning digital practices. Peers, social media, and personal experiences were key sources of knowledge. Formal instruction on digital footprint management was reported to be minimal or absent. Participants expressed interest in structured guidance. This suggests that digital literacy development is largely incidental rather than systematically taught.

Theme 6: Need for Practical and Skill-Based Training
A strong demand for experiential learning emerged across interviews. Prospective Teachers expressed a preference for workshops, demonstrations, and real-life examples. Participants indicated that theoretical knowledge alone is insufficient. Many suggested integrating digital literacy into teacher education curriculum. This supports the recommendation for bridging the awareness–behaviour gap through applied learning strategies.

Theme 7: Gender-Neutral Perceptions and Experiences

No noticeable gender-based differences emerged in participants' responses. Both male and female students reported similar levels of awareness and behaviour. Attitudes towards digital safety and management were largely consistent across genders. This reinforces the quantitative finding that gender is not a significant factor in digital footprint awareness or practices.

Qualitative Findings

The thematic analysis complements the quantitative findings by revealing that although awareness of digital footprints exists among prospective teachers, it often lacks depth and conceptual clarity. Prospective Teachers tend to exhibit safe digital behaviors; however, these practices are largely habitual and not necessarily grounded in informed understanding. Additionally, digital footprint management skills show considerable variation across individuals, indicating inconsistencies in how students handle their online presence. The analysis further highlights that awareness alone is insufficient to ensure responsible digital behavior, thereby underscoring the importance of practical, skill-oriented training. Overall, the qualitative findings reinforce the quantitative results by demonstrating that while students engage in certain safe practices, these are not consistently supported by strong conceptual knowledge or effective management strategies, emphasizing the need for structured, practice-based digital literacy intervention.

VIII. DISCUSSION

The present study investigated Prospective teacher's digital footprint awareness, behavioral practices, and composite management (TFMI), with an emphasis on gender differences and awareness–behavior

associations. The results offer several meaningful insights for research and practice. First, Behavior scores exceeded Awareness scores, suggesting that students tend to follow digital safety practices more consistently than they conceptually understand them. This pattern may reflect habitual or institutionally reinforced behaviors rather than deeply internalized knowledge. The relatively lower awareness levels indicate a potential gap between conceptual understanding and practical implementation a common concern in digital literacy research. The TFMI scores showed the most variation, which means students differ a lot in how they handle their digital footprints. This shows that while some prospective teachers demonstrate strong and consistent digital management skills, others may lack structured or effective routines. Such dispersion underscores the need for differentiated support or tiered interventions that address varying levels of competence. Third, gender-based analyses revealed no significant differences across Awareness, Behavior, or TFMI. This result matches recent studies that show the gender gap in technology-related skills among young adults is decreasing. In this cohort, gender does not appear to serve as a meaningful predictor of digital footprint practices, implying that gender-targeted interventions may be unnecessary or of limited value.

The correlations between Awareness and Behavior were positive but modest and statistically non-significant. Although the direction of association suggests that higher awareness may facilitate better behavioral practices, the weak magnitude indicates that awareness is not the sole determinant of digital behavior. Other factors such as motivation, digital habits, peer influence, or perceived risks may play stronger roles. Since the results were not statistically significant, it shows that increasing awareness alone does not always lead to better behavior. This highlights the need for practical, skill-based learning experiences. Educational interventions may benefit from explicitly bridging the awareness–action gap by providing hands-on practice, modelling appropriate online behaviors, and reinforcing digital hygiene as routine behavior. Given the wide variability in TFMI scores, personalized or tiered digital literacy programs may be especially effective. Finally, since gender differences were negligible, future program planning can focus on universal strategies rather than gender-specific targeting. Overall, the study contributes to the

growing body of evidence on digital literacy and digital footprint management in teacher education contexts, emphasizing the need for integrated, skill-oriented, and inclusive training approaches.

IX. CONCLUSION

The results of this study implies that prospective teachers generally follow good digital safety behaviors, even though their awareness levels are somewhat lower. Their overall digital footprint management (TFMI) varied a lot, meaning that Prospective Teachers differ widely in how they handle and maintain their online presence. There was no major difference between male and female Prospective Teachers, showing that both have almost the same awareness and behavior about digital footprints. Awareness and behavior were linked in a positive way, but the connection was weak and not strong enough to be statistically meaningful. This shows that awareness alone doesn't always improve behavior, and other factors may also affect how students handle their online activities. Based on these results, future programs should focus on helping prospective teachers turn their awareness into practical daily habits, provide different levels of support depending on students' needs, and avoid using gender as a deciding factor when planning digital literacy or safety intervention.

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