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Impact of Digital Citizenship on Online Student Behaviour: Evidence from The University of Swabi

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ABSTRACT

This study examines the impact of digital citizenship on online student behaviour. For this purpose, we distributed structured questionnaires, and data were collected from 198 students at the University of Swabi who use the internet for academic and social purposes. The result from the correlation shows ($r = .419$, $p < .01$) that digital citizenship and online students' behaviour are significant and moderately positive. Regression analysis $F(1,196) = 41.722$, $p < .001$, explaining 17.6% of the variance ($R^2 = .176$) further confirmed that digital citizenship is a significant predictor of online students' behaviour. Moderation analysis also shows that study level and academic department have a significant effect on this relationship. Age, gender, and internet usage experience did not moderate this relationship. In short, the findings of this study suggest that higher levels of digital citizenship are associated with more positive and responsible online behaviour, with variations across academic levels and disciplines. The study highlights the importance of integrating digital citizenship in university curriculum and student support programs to promote ethical and responsible online engagement.

INTRODUCTION

Today's world is experiencing significant changes due to the enhancement of technological tools like the internet, which has become an essential part of our daily lives. Individuals of every age are using the internet for social purposes like communication, entertainment and exchange of information (Isman & Canan Gungoren, 2014). This digital change has affected all aspects of life. The internet nowadays is used worldwide not only for professional but also for academic purpose (El Kibbi2–Najah & Ghamrawi, 2018). Students spend a considerable amount of time surfing the web and explores online platforms and learning management systems. While such engagement provides benefits like improved access to educational materials, global academic communication and collaborative learning (Elsa & Hadid Nur'afra, 2024; Zou et al., 2025). Besides these opportunities there are some risks associated like

misinformation, cyberbullying and academic dishonesty. These behaviours not only affect their digital lives but also their future success.in this context digital citizenship is necessary to address such issues in higher education (Öztürk, 2021).

Digital citizenship is not limited to technical knowledge. It also includes ethical behaviour, critical evaluation of online content, online participation and respect for digital rights and responsibilities. As reported by Choi et al.(2017) digital citizenship is a multidimensional construct that connects digital literacy with respectful and responsible online behaviour. International studies further support this view that students who developed digital citizenship skills are more capable of practicing online respect, privacy and informed decision making (Assante et al., 2022; Gu et al., 2023). Research highlights that digital citizenship is an important element of 21st century because it is directly linked with collaborative learning, effective communication, critical thinking and digital problem solving (Rizaldi et al., 2020). This aligns with Thelma et al.(2024) findings, who report that digital citizenship help to prepare students for future workforce by developing critical thinking, responsible technology use, informed decision making and adaptability. Together these studies suggest that developing digital citizenship skills not only support academic learning but also enable students for the demand of 21st century workplace.

Global evidence indicates that digital citizenship affects online behaviour. For example Jones et al.(2024) found that digital citizenship programmes have a significant effect on reducing irresponsible online behaviour such as misinformation sharing and harassment by promoting empathy and prosocial interaction. Similarly, Sbaffi & Zhao (2022) found that online programmes that focus on academic integrity help to improve responsible behaviour and ethical engagement in higher education students. additionally, Institutional culture and leadership also matter in this context because the universities that promote digital ethics have observed better behavioural outcomes(Ghamrawi, 2018; Mekheimer & Abdelhalim, 2025). Collectively these studies suggest that digital citizenship is a multidimensional construct rather than solely a technical construct.

In developing countries like Pakistan, the role of digital citizenship is even more critical because of uneven digital literacy level and limited policies for cyber safety. Universities after covid-19 pandemic have adopted digital technologies for online learning, virtual assessment and communication purposes. However, recent research indicates that excessive use of screen and irresponsible online behaviour can negatively affect student mental health (Ameer & Hukamdad, 2025). Recent Pakistani studies like Hussain & Shah (2021) report that digital citizenship reduces cyberbullying, and academic institutions can help in the development of digital citizenship. Jamal and Rizvi (2023) further highlight that digital citizenship practices among Pakistani university students are not consistent and vary across academic programs. This reflects limited institutional focus on digital technologies. Research on online victimization of Pakistani university students further highlight the need of digital literacy, ethical technology use, and digital policy to protect students in the digital environment (Saleem et al., 2025). All, these studies support the need for integrating digital citizenship into higher educational structures.

Despite the increasing attention, very limited attention in Pakistani universities has been given to digital citizenship and online student's behaviour. Most of the studies in available literature concentrate on digital literacy, information communications technology skills and cyber safety. Empirical evidence regarding digital citizenship on online student behaviour is scarce. Therefore, context specific research is needed to fill this gap to explore not only the effect of digital citizenship on online behaviour but also to check how demographic factors vary in this relationship.

Therefore, this study aims to investigate the impact of digital citizenship on online student's behaviour at the university of Swabi and examining whether demographic variable like age,

gender, department, study level and internet usage experience moderate this relationship. By addressing this gap, the study aims to provide empirical evidence for policy development, curriculum design in Pakistani universities. The ultimate goal is to support ethical, safe, and positive digital practices that align with global expectations for responsible digital engagement.

LITERATURE REVIEW

Digital citizenship has increased the attention of the researchers over the last many years especially after covid-19 pandemic (Akcil & Bastas, 2021; Buchholz et al., 2020; Kara, 2018). Available literature suggests that this interest is closely linked to the sudden rise of digital technologies in higher education, which has reshaped how students learn, communicate, and participate in academic life. Prior studies highlight that these changes created emerging challenges such as misinformation, cyberbullying, and privacy violations. In this context, scholars and policymakers consider digital citizenship as a framework that can guide students toward ethical and responsible use of these digital technologies (Ribble & Park, 2019).

Recent studies emphasize that digital citizenship goes beyond technical knowledge or digital literacy, but it also includes moral awareness, social responsibility, and appropriate online behaviour. For example, Ribble & Park (2019) identify the key dimensions of digital citizenship such as ethics, digital literacy, communication, and security. They highlight that these elements can help not only understand digital tools but also their responsible use. This view is further supported by Bal & Akcil (2024), who argue that integrating digital citizenship principles into sustainable online courses encourages students to apply ethical values and demonstrate more responsible behaviour in digital learning environments. Together, these studies suggest that well-structured educational programs can transform digital knowledge into positive behavioural outcomes.

Other studies describe that digital citizenship is a lifelong process that involves the development of critical and intercultural digital literacy. For example, Gu et al.(2023) found that students need to learn critical evaluation of information and effective communication across cultures. Similarly, Capuno et al.(2022) emphasise that digital citizenship enables students to engage constructively with online tools ethically and responsibly. Both these studies highlight that awareness and discipline are essential aspects of digital participation. This reinforces that digital citizenship supports respectful and thoughtful online behaviour.

Beyond the conceptual discussions, some studies have directly investigated the relationship between digital citizenship and online students' behaviour. For example, Jones et al.(2024)conducted a large scale experimental study and found that structural programs like the "Be Internet Awesome" curriculum significantly reduced irresponsible online behaviours, including misinformation sharing and online harassment. Similarly, Sbaffi & Zhao (2022) reported that online induction programs focused on academic integrity improved ethical conduct and responsible digital practices among university students. Combined, these studies suggest that digital citizenship is more than raising awareness, but it also promotes values such as respect, empathy, and accountability in online environments.

Besides these positive outcomes, researchers noted that the impact of digital citizenship is not the same in all contexts. Popa & Assante (2024) found that students' understanding and practice of digital citizenship vary across countries and individuals, with institutional and cultural factors playing a significant role. This indicates that digital citizenship frameworks need to be adapted to local educational and social contexts rather than applied as universal models. additionally, Ghamrawi (2018) and Mekheimer & Abdelhalim (2025) emphasise the importance of leadership and moral development, arguing that ethical digital behaviour requires not only instruction but also role modelling by educators and institutional leaders. These perspectives suggest that digital citizenship is a shared responsibility between students and educational institutions.

In developing countries, particularly in Pakistan, the relevance of digital citizenship is becoming more critical. Due to the integration of digital technologies in higher education, students rely heavily on digital tools for learning and communication. Researchers noted that students often face challenges related to online aggressions and misuse of personal data. Universities, therefore, can play a critical role in promoting awareness and encouraging responsible online behaviour through embedding digital citizenship into the curriculum to support students' initiatives. Such efforts can help provide a bridge between digital literacy and digital responsibility. This ensures that students not only develop technical skills but also understand the ethical implications of their digital actions.

Based on the reviewed literature, there is strong support for the idea that digital citizenship contributes to more positive and responsible online behaviour. However, limited research has examined this relationship within Pakistani higher education institutions, particularly while considering demographic and academic differences. To address this gap, the present study examines the impact of digital citizenship on online student behaviour at the University of Swabi. It also explores whether demographic factors influence this relationship.

Accordingly, the following hypotheses are proposed:

H1: Digital citizenship has a positive effect on online student behaviour.

H2: Demographic factors such as gender, age, field of study, and internet usage experience moderate the relationship between digital citizenship and online student behaviour.

METHODOLOGY

This study used a quantitative cross-sectional survey design to examine the relationship between Digital Citizenship (DC) and online behaviour among students at university of Swabi. A quantitative approach was selected because it allows data to be collected numerically and analysed using statistical techniques. The target population consisted of students who use the internet for academic and social purposes. A random sampling approach was adopted, where the questionnaire was distributed openly and participation was voluntary. All eligible participants had an equal opportunity to respond, and no restrictions were placed based on gender, department, or level of study. Although some demographic groups were represented more than others, such variations are common in random and voluntary survey-based research and reflect natural differences in response rates rather than intentional selection. Structured questionnaires were distributed for data collection which consist of three sections. The first section includes demographic information's like age, gender, field of study, level of study and internet usage experience. The second section measured digital citizenship contains 10 items. While the third section measured online student behaviour with 8 items. All the items were rated with 5 Likert scales ranges from 1=strongly disagree to 5= strongly agree. The reliability of instrument was assessed using Cronbach's alpha. Digital citizenship scale showed reliability ($\alpha = 0.76$), and the online behaviour scale also indicate acceptable reliability ($\alpha = 0.75$). These values confirms that instrument used in this study was reliable. SPSS was used to analyse the results. Descriptive statistics were used for demographic analysis and correlation analysis was conducted to examine the relationship between the dependent and independent variable. Regression analysis was used to confirm whether digital citizenship significantly predict online student behaviour. Participation of the respondent was voluntary and informed consent was obtained to assure the confidentiality. The data were used only for academic purposes and ethical considerations were observed throughout the study.

Measures

Digital citizenship was measured with 10 items adapted from (Choi et al., 2017), and online student behaviour was measured with 8 items adapted from online civility scale developed by (Beseler et al., 2023). All these scales were rated with 5 Likert scale ranging from 1= strongly disagree to 5= strongly agree.

RESULTS AND DISCUSSIONS

Descriptive statistics

Variable	Category	Frequency (n)	Percentage (%)
Study Level	BS	178	89.9%
	MS	12	6.1%
	PhD	8	4.0%
Internet Experience	Less than 1 year	16	8.1%
	1–3 years	47	23.7%
	4–10 years	105	53.0%
	More than 10 years	30	15.2%
Department	Agriculture	1	0.5%
	Biological Sciences	5	2.5%
	Computer Sciences	21	10.6%
	Pharmacy	57	28.8%
	Management Sciences	58	29.3%
	Political Science	10	5.1%
	Psychology	4	2.0%
	Urdu	2	1.0%
	Mathematics	1	0.5%
	English	8	4.0%
	Economics	12	6.1%
	Law	5	2.5%
	Chemistry	1	0.5%
	Physics	1	0.5%
	Others	12	6.1%
Gender of Respondent	Male	176	88.9%
	Female	22	11.1%

Age	**18–20 years**	38	19.2%
	21–25 years	142	71.7%
	26–30 years	8	4.0%
	Above 30 years	10	5.1%

The descriptive analysis shows that total 198 students from the University of Swabi participated in the study. Most of them were from BS programs (89.9%) while MS students' participation was (6.1%) and PhD (4.0%). The majority of the respondents had 4-10 years of internet usage experience which is (53%) of the total sample size. Most of the respondents were from Management sciences (29.3%) and Pharmacy (28.8%). The sample was predominantly male (88.9%), and most respondents were between 21–25 years old (71.7%).

Correlation

The Pearson correlation results show that digital citizenship and online behaviour are positively and significantly correlated ($r = .419$, $p < .01$). This indicate that students with higher level of digital citizenship skills are associated with responsible online behaviour at university of Swabi. These results demonstrate that correlation is moderate in strength and suggest that when digital citizenship increases the responsible online behaviour positively improves.

Variables	Digital Citizenship (DC)	Online Behaviour (OB)
Digital Citizenship (DC)	1	.419**
Online Behaviour (OB)	.419**	1
N	198	198
Sig. (2-tailed)	.000	.000

Regression

A simple linear regression analysis was run to examine the impact of digital citizenship on online student behaviour among the students of university of Swabi. The results shows that digital citizenship significantly affect online behaviour. The values $F(1,196) = 41.722$, $p < .001$, shows that the model is statistically significant and demonstrate digital citizenship reliably forecasts the dependent variable online students' behaviour. The model produced R value of .419 and R square value of .176 which indicate that digital citizenship shows 17.6% variations in online student behaviour. This reflects a moderate explanatory power of the model. The adjusted R square confirmed that model is valid predictor after adjustment in sample size. The coefficients table shows that digital citizenship has significant positive influence on online behaviour ($B = .449$, $\beta = .419$, $t = 6.459$, $p < .001$). This means that for every one unit increase in digital citizenship causes 0.449 units increase in online behaviour. Constant values also shows that when digital citizenship is zero the baseline on online behaviour remains positive ($B = 2.263$, $t = 8.329$, $p < .001$).

Analysis	Statistic	Value
Model Summary	R	.419
	R Square	.176

Analysis	Statistic	Value
	Adjusted R Square	.171
	Std. Error of the Estimate	.47177
ANOVA	F (1,196)	41.722
	Sig. (p-value)	.000
Coefficients	Constant (B)	2.263
	Constant (t-value)	8.329
	Constant (Sig.)	.000
	DC → OB (B)	.449
	Standardized Beta (β)	.419
	t-value	6.459
	Sig. (p-value)	.000

Moderation analysis

PROCESS v 4.2 was used for moderation analysis. The purpose was to test whether demographic factors moderates the relationship between digital citizenship and online students' behaviour. The results shows that study level and department significantly moderate this relationship while age, gender and internet usage experience was not found to moderate. The values (B = −.2579, t = −2.33, p = .0208) shows that interaction term for study level was significant. This suggest that the strength of the effect of digital citizenship on online students' behaviour depend on whether the students are at BS, MS, and PhD level. Similarly, the interaction with the department was also significant (B = .0539, p = .0063). This shows differences between academic disciplines. However, the values for age (p = .1361), gender (p = .8744), and internet experience (p = .9221) indicate that the interaction effects is insignificant and means that they do not moderate the relationship.

Moderator	Interaction Term (B)	t-value	p-value	Significance	Moderation Result
Age	−.2527	−1.49	.1361	Not Significant	✗ No Moderation
Gender	.0570	0.158	.8744	Not Significant	✗ No Moderation
Department (Dept.)	.0539	2.76	**.0063**	**Significant**	✓ Moderation Supported
Internet Experience (IntExp)	−.0075	−0.0979	.9221	Not Significant	✗ No Moderation
Study Level (StudLvl)	−.2579	−2.33	**.0208**	**Significant**	✓ Moderation Supported

Hypothesis Testing Results

The hypotheses of this study were tested on the base of the statistical analysis. Below the table shows the results of the hypothesis testing.

Hypothesis	Statement	Result	Decision
H1	Digital citizenship has a positive effect on online student behaviour.	Significant positive relationship and prediction ($r = .419$, $p < .01$; $\beta = .419$, $p < .001$).	✔ Accepted
H2	Demographic factors (gender, age, field of study, internet usage experience) moderate the DC → OB relationship.	Moderation supported only for study level and department; not supported for age, gender, internet experience.	✔ Partially Accepted

DISCUSSION

This study addresses the impact of digital citizenship on online students' behaviour at the University of Swabi. The results indicate that when students have higher level of digital citizenship skills they behave more responsibly and ethically in online environment. This means when students are aware of online ethics, respect and privacy are more likely to engage positively while using internet. The correlation and regression analysis support that digital citizenship is significant predictor of online behaviour. These results matches with the existing literature which suggests that digital citizenship can reduce harmful online actions such as cyberbullying, misinformation sharing and academic dishonesty(Choi et al., 2017; Ribble, 2015). Other studies also showed that structural and formal digital citizenship programs and online training help students behave responsibly online(Jones et al., 2024; Sbaffi & Zhao, 2022). This study further add evidence from Pakistani Public Sector University where formal training on digital responsibility is still limited but strongly urged.

This study also explored some interesting insights like moderation of demographics. Which shows that study level and academic departments change the effect of digital citizenship on online behaviour. This means that digital citizenship matters more for some groups than others. For example students in a specific department or at higher level of study may have more exposure to digital technologies like online courses and discussions about ethics .in this way digital citizenship has strong impact on how they behave online.

Other factors like gender, age and internet usage experience did not significantly moderate this relationship, which suggests that digital citizenship can be helpful for many different kinds of students rather than whether they are young or older, male or female or they have been using internet for a long time or only a few years. The pattern is same for all students who understand digital citizenship, they behave responsibly and ethically.

In short, this study highlights the importance of integrating digital citizenship in higher education settings. Because it not only improves students' knowledge but also prepare them for safe online actions. For a Country like Pakistan where the use of digital technologies is rapidly increasing but often lack digital ethics in education. These results are more meaningful.

CONCLUSION

This study concluded that higher digital citizenship is linked with more positive online behaviour. Because the results confirmed that digital citizenship is a significant predictor of online behaviour and it explained a meaningful part of its variation. This means when students are taught the responsible and respectful use of digital tools they behave more positively and ethically. This study also found that digital citizenship and its effect on online behaviour is not the same for all group of students. Certain factors like study level and department play an important role in shaping this relationship. While age, gender and internet usage experience has no effect to make this relationship stronger or weaken. This means that universities should

consider these factors while designing or integrating digital citizenship into their curriculum. In simple words this research shows that digital citizenship works well and support better online behaviour. It also helps the universities to address the issues like cyberbullying and misuse of information's in digital spaces. Based on the finding the universities in Pakistan should seriously consider to integrate the topics of digital citizenship into their courses, orientations and proper student support programs should be arranged. Such integration can help students to succeed not only academically but also become responsible digital citizen.

Limitations of the Study

1. Despite the contribution of this study, there are some limitations that should be given attention while interpreting the results. First the data were collected from a single university which may limit to apply these results to other universities in Pakistani region. Students from other universities may have different exposure to these technologies which can influence their online behaviour.
2. Second they study was cross sectional and data were collected at one time. And long term effect of digital citizenship on online students' behaviour was not examined.
3. Third the data were collected on the base of self-reported responses which may be influences by social desirability bias.
4. Alongside these limitations, this study provides useful empirical insight into the relationship between digital citizenship and online student behaviour in a Pakistani public sector university.

Future Research Directions

Future research can help in several ways.

1. Similar studies should be conducted across different universities and region in Pakistan to improve the generabilizibility of the results. Private institutions should also be considered for more comprehensive understanding of such practices.
2. Future studies can also adopt longitudinal research design to see whether educational interventions have lasting effects on students' digital conduct.
3. Qualitative approach such as interviews could be used alongside surveys to gain deeper understanding into students' experience, perceptions and challenges associated with digital citizenship.

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