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Analysis of Demographic Variables and Digital Citizenship of Prospective Teachers in Distance Learning



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Abstract: *Digital citizenship has emerged as a crucial concept to be learnt in the digital environment of 21st century. It becomes more critical for learners in open and distance education where they significantly rely on digital tools for communication, cooperation, personal and academic pursuits. The study examined undergraduate distance learners' perceptions on digital citizenship with respect to their demographic variables. A structured questionnaire was used to gather data from undergraduate distance learners using a quantitative research methodology. Both descriptive and inferential statistical methods were applied to the data analysis. The study was based on the digital citizenship framework of Ribble and Park (2022). The Population comprised of undergraduate students who were studying at Allama Iqbal Open University in district Muzaffarabad, AJK. The sample of this research study was 370 which was drawn using random sampling technique. The findings of the study revealed that distance learners' practices are generally high and consistent, with strengths in communication, law, etiquette, commerce, rights, and security, areas such as digital literacy and access still need improvement. Most undergraduate distance learners exhibit good digital citizenship behaviors, such as polite online communication, responsible use of digital resources, and knowledge of privacy and security concerns. Nonetheless, several issues with digital ethics, information assessment, and cyber safety awareness were noted.*

Keywords: Digital Citizenship, literacy skills, undergraduate distance learners, perceived practices.

Introduction

The growing use of digital technology has also sparked worries about ethical and responsible conduct in online settings. In this regard, the notion of digital citizenship has become increasingly important in educational environments. The responsible, moral, safe, and efficient use of digital tools and online platforms is referred to as "digital citizenship." Digital literacy, online manners, cyber safety, digital rights and responsibilities, communication, and ethical engagement in online communities are

just a few of its many facets. Practicing digital citizenship is crucial for effective and fruitful learning experiences for undergraduate distance learners, who primarily rely on digital resources for communication, collaboration, research, and academic activities. Understanding learners' perceived practices of digital citizenship is especially crucial in the context of undergraduate distance learning as undergraduate students are expected to participate in considerable online engagement, academic research, and independent study. Their

career growth, communication abilities, and academic achievement can all be strongly impacted by their capacity to behave as responsible digital citizens.

Thus, the purpose of this study is to analyze distance learners' digital citizenship by looking at how they view their activities and comparing them to demographic characteristics. The results of this study might improve online learning environments, support ethical and responsible use of technology in distant education institutions, and improve digital literacy programs.

Digital literacy refers to the capacity to comprehend how to use and maintain safety when utilizing digital resources, technologies, as well as additional network installations. Digital literacy includes the skills necessary to use the readily available digital tools carefully and effectively to share or work with others as well as to better comprehend, learn, create, and manipulate information (Ahmad et al., 2021). Digital citizenship is the skill to use available digital technology with confidence and positivity. It is stated that, to ensure online safety, cybersecurity, digital responsibility, digital health and safety, as well as to help staff and learners attain and comprehend digital literacy, digital citizenship education which encompasses awareness, literacy, and skills is crucial (Ribble, 2015).

Digital citizenship education becomes crucial in tackling the issues brought about by the global nature of the internet, stressing the importance of safeguarding personal information and online identities for a technologically advanced and culturally varied community (Snezana, 2022).

Several studies highlighted the significance of Digital Citizenship (DC) recognition. According to Hollandsworth et al. (2017), research, low levels of Digital Literacy and education can and have led to disruptive, even destructive, student behavior. Similarly, Kim and Choi (2018) youth's ability to use the internet for education may be limited if they lack the skills to explore it, use it infrequently in a flimsy way, and restrict their research to a small number of subjects that they think are important. Adequate instruction

and comprehension of digital citizenship empower user groups to make morally sound decisions that are responsible, courteous, and responsible when interacting with one another in an online setting.

To apply the Ribble (2015) model for Digital Citizenship (DC) in Philippine schools, research was conducted on teachers' and students' awareness of the concept in a particular study area for the sample. The research study found that while a significant number of teachers and students were conscious of the idea, there was still deficiency in the areas of Digital safety and Digital law, which increased the risk factor (Suson, 2019). They recognized the issue that nations with comparatively smaller media footprints run the risk of falling behind in the context of Digital Citizenship (DC), and that the only way to keep up with the times is to comprehend this problem and seek to bridge the gaps that these nations are experiencing. In today's technologically advanced world, digital education is crucial, with the primary goal being to prepare young people for the challenges that will inevitably arise. In the twenty-first century, a number of aspects help pupils become digital citizens. Academic achievement, the atmosphere in which students learn and behave, and students' lives outside of school are the important aspects (Elmahı et al., 2020). Young people and technology, two characteristics that are commonly linked to social media issues are youth and technology, both of which are equally important. Digital citizenship literacy skills encompass attitudes and understanding regarding the usage of digital technologies. Digital citizenship, or the social perspective on the proper and responsible use of technology, was made by Ribble (2015) and Ribble & Park (2022). Nine (9) components of good digital citizenship were digital Access, digital etiquette, digital law, digital communication, digital literacy, digital commerce, digital rights and responsibilities, digital security, digital health & safety.

Distance learners in the digital era need to be aware of the fundamentals of digital citizenship literacy skills, as they utilize online platforms for education, communication, and daily activities.

Different skills are included in digital citizenship, such as digital literacy, online safety, moral use of internet, and responsible online behavior. However, many students show a lack of understanding and awareness of these concepts, especially those who are enrolled in distance learning programs. Thus, it is necessary to investigate the degree of digital citizenship literacy knowledge among distant learners and to investigate how educational initiatives might better equip learners to perform better in the digital world. The extent of digital citizenship literacy knowledge among AIOU distance learners requires further investigation to build a base for distance education sector stakeholders, which can be used to create policies and action plans that ensure the responsible and appropriate use of technology tools for teaching and learning. The study is based on Mike Ribble's widely recognized framework, the nine elements of Digital Citizenship (Ribble, 2015). This model serves as the theoretical underpinning because it offers a thorough and organized understanding of digital citizenship, especially related to educational contexts and student digital behavior. This model was chosen because it offers a comprehensive and structured knowledge of digital citizenship, encompassing a broad variety of technological, ethical, and behavioral concepts important to both distance learners and teachers in online learning environment.

Problem Statement

Digital citizenship is educating and equipping learners to use technology in ways that are appropriate, secure, and beneficial by teaching them to follow suitable usage guidelines (Alqirnas, 2022). The idea of digital citizenship is instructive when it comes to teaching learners how to use technology and how to think critically about digital information. Distance learners in the digital era need to be aware of the fundamentals of digital citizenship, as they utilize online platforms for education, communication, and daily activities. Different skills are included in digital citizenship, such as digital literacy, online safety, moral use of internet, and responsible online behavior. However, many students show a lack of

understanding and awareness of these concepts, especially those who are enrolled in distance learning programs. Despite the growing importance of digital skills in both personal and professional contexts, most of the time, learners struggle to perform activities in the online world effectively. Distance learners find it more challenging to use technology responsibly and securely because they lack the necessary knowledge and skills for digital citizenship, which is a major challenge for acquiring distance education. Distance learners may be at danger for identity theft, cyberbullying, online harassment, and false information if they are not properly trained and guided.

It is necessary to examine the perceived practices of digital citizenship among distant learners and to evaluate how educational initiatives might better equip learners to perform better in the digital world. The perspectives on digital citizenship among the distance learners, considering demographic factors, including years of experience and gender, have not been thoroughly explored in previous research studies. The extent of digital citizenship knowledge and practices among AIOU distance learners requires further investigation to build a base for distance education sector stakeholders, which can be used to create policies and action plans that ensure the responsible and appropriate use of technology tools for teaching and learning.

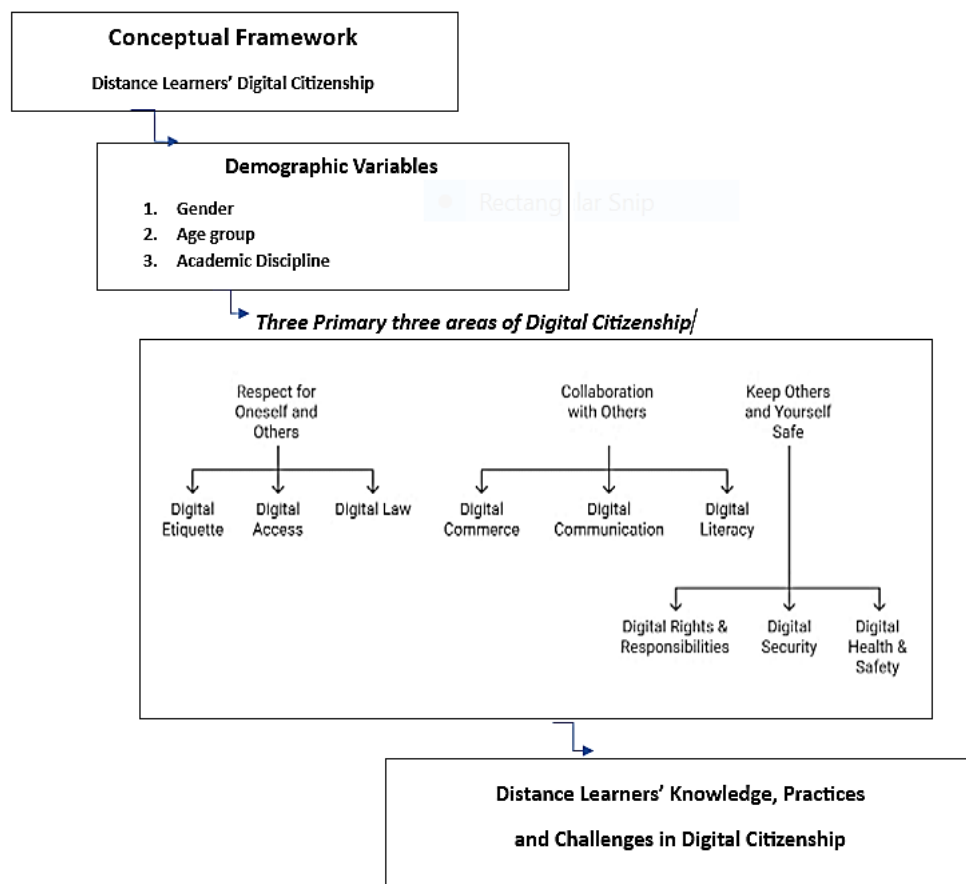
Research Objective:

- To examine perceived practices of distance learners on digital citizenship.

Research Questions:

- What are the perceived practices of distance learners regarding digital citizenship?
- How do distance learners demonstrate responsible and ethical behavior in online learning environments?
- What digital citizenship practices are commonly adopted by undergraduate distance learners during online learning activities?

Figure 1 *Conceptual Framework*



The study's conceptual framework is based on Ribble's (2015) nine elements of Digital Citizenship, which fall into three primary categories: Keep others and Yourself (Rights and Responsibilities, Safety/Health, and Security), Collaboration with others (Communication, Literacy, and Commerce), and Respect for oneself and others

(Etiquette, Access, and Law). A thorough framework for examining how distant learners perceive and practice digital citizenship is provided by these elements.

The framework incorporates demographic factors including age group, gender, academic discipline, and internet access in addition to these aspects. It is expected that these features could influence learners' awareness and behavior regarding numerous components of digital citizenship. The study's conclusion is that distance learners' awareness and behaviors are ultimately shaped by the interaction between demographic characteristics and digital citizenship aspects. The framework ensures a comprehensive knowledge of digital citizenship

in the context of distance learning by linking together learner activities, demographics, and conceptual categories.

Although Ribble's (2015) Nine Elements of Digital Citizenship model was

originally introduced in 2011 and updated in 2015, It is still one of the frameworks for teaching digital citizenship that is most frequently used and cited. Its continued relevance is supported by recent studies that still adopt this model due to its comprehensive coverage of digital behavior, ethics, and skills (Alqahtani, 2017; Çubukçu & Çubukçu, 2021). Furthermore, in a variety of educational contexts, no more recent framework has yet to attain the same degree of popularity or usefulness. Because Ribble's approach is clear, has enduring impact, and fits with the goals of distance learning in the digital age, this study used it.

Methodology

This study was descriptive in nature. A survey technique was used to investigate the distance

learners' perceived practices about digital citizenship. The design was chosen according to Creswell and Creswell (2017), as it was stated that Survey research describes trends, attitudes, or opinions quantitatively or numerically using a sample of the population.

Population and Sample

According to data from the regional office in Muzaffarabad, 9520 distance learners registered in the 2022–2023 session at AIOU, Muzaffarabad area of AJK.

The sample size was 370 students (with a 95% confidence level and a 5.0% margin of error). Respondents were chosen at random using a table of random numbers after the necessary sample size was established. After formally asking authorization for research purposes, the Regional Office provided the list of enrolled students. Respondents were chosen at random from the soft-form population list. Every member of the population had an equal chance of being included in the research thanks to this technique.

Research Instrument

A research tool was developed based on the literature review. The survey questionnaire based on aspects of digital citizenship was used. The following dimensions were:

(1) respect oneself and others, (2) collaboration with others, and (3) keeping oneself and others safe. A five-point Likert scale was used to rate each questionnaire item ranging from Strongly Disagree to Strongly Agree where 1 to 5 scoring criteria was followed. Respondent's mean score in each scale of the tool was computed to check the perceived level of digital citizenship literacy.

In order to establish the content and face validity of the instrument, the researcher consulted six experts in the second stage.

The validity of the research instrument was

ensured by six experts. Cronbach's Alpha value was 0.82*. Justification for use of Likert Scale is that "The Likert scale was appropriately used because the study exclusively aimed to measure attitudes toward Digital Citizenship, which fall within the affective domain and are best captured through attitudinal scales.

Data Collection Procedure and Analysis

The study adhered to the research ethics guidelines. In this regard, before data collection, the regional office of AIOU was approached by the researchers personally and the list containing details of distance learners who enrolled in undergraduate level of session 2022-2023 at AIOU in the Muzaffarabad region. Then, the sample was selected, and the consent was obtained from participants to participate in the study. They were briefed about the objectives of the study and told that their confidentiality would be maintained and the information they would provide would not be leaked out. The data were collected in-person (using the survey form) from a stratified random sample of distance learners. Respondents were asked frequently to fill the scale which took 6 weeks to complete data collection. The data were analyzed in terms of descriptive (percentage, mean and SD) and inferential statistics (Independent t-test, one-way ANOVA and Post Hoc test).

Validity of Research Instrument

The validity was sought by six experts of the relevant field, who verified each statement's linguistic correctness and suitability for the study's objectives. Suggested modifications were incorporated to develop a valid instrument.

Following the expert's feedback, the Content Validity Index (CVI) was

calculated. 5 experts recommended making slight changes to some items of

questionnaire without removing any. The details are as follows:

Table 1

Experts Response regarding Review of Research Instrument

Expert	Minor adjustments to Item No
Expert 1	3,17
Expert 2	4,8,12,16
Expert 3	3

The instrument should have an Average Scale Content Validity Index of at least 0.83 (Polit & Beck, 2007; Yusoff, 2019, p. 51). The scale level content validity index based on the universal agreement (S-CVI/UA) was 0.80, and the SCVI/Ave of the instrument was 0.96, both of which were acceptable for validity of the instrument. Experts' suggestions (Table 1) were incorporated, and the items were modified accordingly. The modified instrument was later on used for pilot testing.

(The calculation of CVI is attached in Annexure D, and the certificate from the expert is attached in Annexure E)

Table 2

Reliability Statistics of Items

Dimensions	Cronbach's Alpha
Knowledge items on digital citizenship	
1-10	0.80*
Practices items on digital citizenship	
1-36	0.80*
Difficulties in exhibiting digital citizenship	
exhibiting digital citizenship.	0.75*
1-10	
All Items (1-56)	0.82*

Table 2 represents the number of items for each dimension of Digital Citizenship among distance learners with value of Cronbach's Alpha.

Reliability of Research Instrument

Pilot testing is a small-scale investigation intended to find out the reliability of the research tool (Ullah et al., 2023). Before collecting data, Pilot testing was carried out to guarantee the questionnaire's reliability. It is suggested to have 30 respondents or 10% of the sample, for pilot testing when the population is large. Hence, to check the reliability of the questionnaires, data from 37 respondents (15 Males and 22 Females at 10% of sample) were collected through the same instruments. SPSS was used to find the value of Cronbach's Alpha to measure reliability.

The value of Cronbach's Alpha for all (56 items) was 0.82. These values indicated good internal consistency, demonstrating that the instrument was reliable.

Results

Table 2

The Respondents' Gender Frequency Distribution

Gender	F	Percentage
Male	148	40%
Female	222	60%
Total	370	100%

According to the data above, the majority of responders (60%) were female, while the minority (40%) were male. The frequency data showed that female enrollment is higher than

male enrollment.

Table 3

Frequency Distribution of the Academic Discipline of the Respondents

Academic Discipline	Science		Arts/Social Science		Computer Science		Total
	F	Percentage	f	Percentage	f	Percentage	
Male	31	20.9 %	72	48.6 %	45	30.4 %	140
Female	48	21.6 %	91	41 %	83	37.4 %	230
Total	79	100 %	163	100	128	100 %	370

The f (frequency) of the respondents showed that 20.9% male and 21.6% female science group, explaining the respondents' opinions about their level of familiarity with the idea of digital citizenship. while 48.6% male and 41% female from arts / social science group showed

their responses. The frequency of the respondents of computer science showed that 30.4 % male and 37.4 % female. respondents' answers to five items from the instrument were quantified using descriptive statistics, which were shown as percentages.

Dimensions	Mean score	SD
Digital Literacy	3.5	.86
Digital Commerce	3.8	.82
Digital Communication	3.9	.80
Digital Etiquette	3.9	.78
Digital Law	3.9	.82
Digital Rights and responsibility	3.8	.77
Digital Health and Safety	3.9	.73
Digital Security	3.8	.72
Digital Access	3.6	.71
Overall Digital Citizenship	3.8	.48

Table 4

Frequency Distribution of the Age Group, using the Internet experience of the Respondents

Age Group	f	Percentage
22-29 Years	97	26.2
30-37 Years	93	25.1
38-45 years	108	29.2
46 Years and above	72	19.5
Total	370	100

The frequency (f) of respondents showed that 26.2% were in the 22-29 Years age group, 25.1% were in the 30-37 Years age group and 29.2% were in the 38-45 years age group, reflecting the respondents' Internet usage

experience and practices of digital citizenship. Meanwhile, 19.5% of respondents were in the 46 years and above age group, also sharing their responses regarding internet usage experience. respondents ' answers to five instrument

statements were quantified using descriptive

statistics, which were shown as percentages.

Table 5

Digital Citizenship Practices among Distance Learners

Dimensions	Mean score	SD
Digital Literacy	3.5	.86
Digital Commerce	3.8	.82
Digital Communication	3.9	.80
Digital Etiquette	3.9	.78
Digital Law	3.9	.82
Digital Rights and responsibility	3.8	.77
Digital Health and Safety	3.9	.73
Digital Security	3.8	.72
Digital Access	3.6	.71
Overall Digital Citizenship	3.8	.48

Table 5 presents the analysis of digital citizenship sub-factors among respondents indicated that overall digital citizenship is high (Mean = 3.8, S.D. = 0.48), suggesting that respondents generally showed strong knowledge, responsible behavior, and safe practices in digital environments. Individually, distance learners scored high in Digital Commerce (M = 3.8), Digital Communication (M = 3.9), Digital Law (M = 3.9), Digital Rights and Responsibility (M = 3.8), Digital Health and Safety (M = 3.9), Digital Etiquette (M = 3.9), and Digital Security (M = 3.8), demonstrating

competence and awareness in these areas. Mean scores for Digital Literacy (M = 3.5) and Digital Access (M = 3.6) were moderate, demonstrating some areas for improvement in digital skills, appropriate online behavior, and equal access to digital resources. The relatively low standard deviations across sub-factors suggested that distance learners' experiences and practices are fairly consistent. Overall, the findings reveal that distance learners are well prepared to engage responsibly and effectively in digital environments.

Table 6

Comparison of Means Regarding Practices of Digital Citizenship between male and female distance learners

S. No	Dimensions	Group				df	t-value	p-value
		Male		Female				
		Mean	SD	M	SD			
1	Digital Literacy	3.2618	.97692	3.7635	.71572	249.755	-5.361	.000
2	Digital Commerce	3.8750	.81258	3.9099	.82748	368	-.400	.689
3	Digital Communication	3.9544	.87581	3.9133	.75961	368	.479	.632
4	Digital Etiquette	3.9611	.77026	3.9392	.79001	368	.265	.791
5	Digital Law	4.0101	.66553	3.8784	.91763	365.367	1.599	.111
6	Digital right & Responsibility	4.0338	.65247	3.7680	.82776	368	3.284	.001
7	Digital Security	4.0304	.65783	3.8074	.76054	368	2.913	.004
8	Digital Access	3.6993	.79591	3.5541	.64205	368	1.935	.054
9	Digital Health & Safety	3.9780	.83449	3.9212	.67055	368	.724	.470

Table 6 present that an independent sample t-test was conducted to test the hypothesis H_0 1. The Table demonstrates comparison between the genders (Male and Female) regarding practice of nine dimensions of Digital Citizenship,

including statistical analysis results with means, standard deviation, df (degree of freedom), t-values, and significant levels (sig). The independent samples t-test demonstrated significant gender (Male and Female)

differences in three dimensions of digital citizenship. Female learners scored significantly higher in Digital Literacy ($p = .000$), while male distance learners scored significantly higher in Digital Rights and Responsibility ($p = .001$) and Digital Security ($p = .004$). So, in some areas result revealed, there is a significant difference. This leads to rejecting H0 1. On other side result revealed that there is no significant statistically differences were founded between male and female distance learners in Digital Commerce,

Digital Communication, Digital Etiquette, Digital Law, or Digital Health and Safety, whereas Digital Access revealed a near significant difference ($p = .054$), with male learners reporting slightly higher access. These results indicated that gender influences certain areas of digital citizenship, particularly digital literacy, rights & responsibility, and security, while other dimensions remain consistent across groups. This leads to partially supporting H0¹.

Table 7

Difference in Learners' Digital Citizenship Practices according to their Academic Discipline (Science, Arts/Social Science, Computer Science)

Dimensions		Sum of Squares	df	Mean Square	F	p-value
Digital Literacy	Between Groups	3.264	2	1.632		
	Within Groups	272.587	367	.743	2.198	.113
	Total	275.852	369			
Digital Commerce	Between Groups	.278	2	.139	.206	.814
	Within Groups	248.216	367	.676		
	Total	248.494	369			
Digital Communication	Between Groups	2.339	2	1.169	1.803	.166
	Within Groups	238.084	367	.649		
	Total	240.423	369			
Digital Etiquette	Between Groups	.188	2	.094	.154	.858
	Within Groups	224.998	367	.613		
	Total	225.186	369			
Digital Law	Between Groups	.928	2	.464	.676	.509
	Within Groups	251.815	367	.686		
	Total	252.743	369			
Digital Rights & Responsibility	Between Groups	.022	2	.011	.018	.982
	Within Groups	220.259	367	.600		
	Total	220.281	369			
Digital Health & Safety	Between Groups	3.629	2	1.815	3.357	.036
	Within Groups	198.395	367	.541		
	Total	202.024	369			
Digital Security	Between Groups	2.611	2	1.305	2.479	.085
	Within Groups	193.248	367	.527		
	Total	195.858	369			
Digital Access	Between Groups	.231	2	.115	.228	.796
	Within Groups	185.864	367	.506		
	Total	186.095	369			

Table 7 represents Sum of Square (SS), Mean (M), Standard Deviation (SD), Degree of freedom (df). A One-way ANOVA test was conducted regarding their digital

citizenship practice on academic groups wise (science, arts/ social science and computer science). The one-way ANOVA results revealed that there were no significant differences among groups in most digital citizenship dimensions,

including digital literacy, digital commerce, digital communication, digital etiquette, digital law, digital rights and responsibility, digital security, and digital access ($p > .05$). However, a statistically significant difference was found in Digital Health and Safety ($F = 3.357$, $p = .036$), demonstrating that belonging to a group influenced participants' awareness and practices related to health and safety in digital environments. These results indicated that while

most aspects of digital citizenship are consistent across groups, Digital Health and Safety is an

area where notable difference exists, requiring further investigation through post-hoc analysis.

Table 8

Post Hoc Test (Multiple Comparison) for the Digital Health and Safety practices among distance learners

Dimension	(I) GROUP	(J) GROUP	Mean Difference (I-J)	Sig.
Digital Health and Safety	Science Group	Arts social Science Group	.21465	.102
		Computer Science	.02598	1.000
	Arts social Science Group	Science Group	-.21465	.102
		Computer Science	-.18866	.091
	Computer Science	Science Group	-.02598	1.000
		Arts social Science Group	.18866	.091

Table 8 presents the result of Post hoc test. Science vs. Arts & Social Science (Mean Diff = 0.21465, $p = .102$), science distance learners scored slightly higher in Digital Health & Safety, but the difference is not statistically significant. While science vs. computer science (Mean Diff = 0.02598, $p = 1.000$), almost there is no statistically

significant difference; scores are essentially the same (not significant). Arts & social science vs. science (Mean Diff = -0.21465, $p = .102$), Arts learners scored slightly lower than science learners, but again not significant. Arts & Social Science vs. Computer Science (Mean Diff = -0.18866, $p = .091$). Arts learners scored a little lower than

computer science learners. This is close to significance ($p = .091$) but still not

statistically significant at the 0.05 level. Computer science vs. science (Mean Diff = -0.02598, $p = 1.000$), No difference at all (not significant). computer science vs Arts & social science (Mean Diff = 0.18866, $p = .091$). Computer science learners scored a little higher than Arts distance learners, but the difference is

not significant ($p > 0.05$).

A one-way ANOVA conducted to investigate significant differences in digital citizenship dimensions across academic groups (Science, Arts & Social Sciences, and Computer Science). The results revealed that in most aspects of digital citizenship, Digital Literacy, digital commerce, digital communication, digital etiquette, digital law, digital rights & responsibility, digital security, and digital access, there were no statistically significant differences found between the groups ($p > .05$). Nevertheless, a significant difference was found in Digital Health & Safety ($F(2, 367) = 3.357$, $p = .036$). To further explore this finding, post hoc comparisons using the Tukey HSD test were executed. The results showed that no pairwise group comparisons reached statistical significance (all $p > .05$). Although mean differences indicated that Science and Computer Science students scored slightly higher than Arts & Social Science students in Digital Health & Safety, these differences did not meet the threshold for statistical significance. This leads to supported H_0 ².

Table 9

Learners Digital Citizenship Practices According to their Age Group (22–29, 30–37, 38–45, and 46 years and above)

Dimensions		Sum of Squares	df	Mean Square	F	Sig.
Digital Literacy	Between Groups	6.911	3	2.304	3.135	.026
	Within Groups	268.940	366	.735		
	Total	275.852	369			
Digital Commerce	Between Groups	5.065	3	1.688	2.539	.056
	Within Groups	243.429	366	.665		
	Total	248.494	369			
Digital Communication	Between Groups	5.142	3	1.714	2.666	.048
	Within Groups	235.281	366	.643		
	Total	240.423	369			
Digital Etiquette	Between Groups	1.401	3	.467	.764	.515
	Within Groups	223.785	366	.611		
	Total	225.186	369			
Digital Law	Between Groups	2.946	3	.982	1.439	.231
	Within Groups	249.797	366	.683		
	Total	252.743	369			
Digital right & Responsibility	Between Groups	4.229	3	1.410	2.388	.069
	Within Groups	216.052	366	.590		
	Total	220.281	369			
Digital Security	Between Groups	1.359	3	.453	.826	.480
	Within Groups	200.664	366	.548		
	Total	202.024	369			
Digital Access	Between Groups	.336	3	.112	.210	.890
	Within Groups	195.523	366	.534		
	Total	195.858	369			
Digital Health & Safety	Between Groups	3.266	3	1.089	2.180	.090
	Within Groups	182.829	366	.500		
	Total	186.095	369			

Table 9 presents that the result of post hoc test and ANOVA analyzed had a significant effect on their digital citizenship across different dimensions. The results are as follows:

In digital literacy ($F(3,366) = 3.135, p = .026$) there is significant differences were found. This demonstrates that distance learners' digital literacy varies by academic discipline, suggesting that certain groups (likely Science/Computer Science) have strong digital literacy skills compared to Arts/Social Sciences. Digital commerce ($F(3,366) = 2.539, p = .056$) there is no statistically significant difference at the .05 level. However, the p-value is nearest to significance, which indicating a possible variation that could require further investigation. Digital Communication ($F(3,366) = 2.666, p = .048$) also represent there is a significant difference. This demonstrates that communication related digital practices differ across groups. Digital Etiquette ($F(3,366) = .764, p = .515$) showed that there are no

significant differences. This showed that all groups demonstrate similar levels of digital etiquette, regardless of their academic discipline. Digital Law ($F(3,366) = 1.439, p = .231$) also revealed that there are no significant differences. Distance learners across disciplines appear to have comparable awareness of digital laws and regulations. Digital rights & responsibilities ($F(3,366) = 2.388, p = .069$) this is also, not significant at the .05 level, but nearest. Digital Health & Safety ($F(3,366) = 2.180, p = .090$), no significant difference was found at the .05 level, but close to significance. This indicates a weak tendency that could indicate some group-level differences in awareness of digital health and safety. Digital Security ($F(3,366) = .826, p = .480$), no significant differences were found. Digital Access ($F(3,366) = .210, p = .890$), no significant differences were found. Distance learners have similar levels of digital access regardless of their discipline.

The ANOVA analysis revealed significant differences across academic disciplines in digital literacy and digital communication, while no significant differences were found in most other dimensions of digital

citizenship. Digital commerce, rights and responsibilities, and health and safety were near-significant, suggesting possible variations worth further study.

Table 10

Multiple Comparison for Digital Literacy and Digital Communication Practices among distance learners

Dimensions	(I) AGE	(J) AGE	Mean Difference (I-J)	Sig.
Digital Literacy	22 -29 Years	30-37 Years	-.05570	1.000
		38-45 Years	-.18869	.699
		46 and above	-.37851*	.029
	30-37 Years	22 -29 Years	.05570	1.000
		38-45 Years	-.13299	1.000
		46 and above	-.32280	.102
	38-45 Years	22 -29 Years	.18869	.699
		30-37 Years	.13299	1.000
		46 and above	-.18981	.878
	46 and above	22 -29 Years	.37851*	.029
		30-37 Years	.32280	.102
		38-45 Years	.18981	.878
Digital Communication	22 -29 Years	30-37 Years	-.01330	1.000
		38-45 Years	-.22544	.271
		46 and above	-.26364	.211
	30-37 Years	22 -29 Years	.01330	1.000
		38-45 Years	-.21214	.373
		46 and above	-.25034	.285
	38-45 Years	22 -29 Years	.22544	.271
		30-37 Years	.21214	.373
		46 and above	-.03819	1.000
	46 and above	22 -29 Years	.26364	.211
		30-37 Years	.25034	.285
		38-45 Years	.03819	1.000

Table 10 presents the result of post hoc test, that in digital literacy, a statistically significant difference was founded between the 22–29 years group and the 46 and above group (Mean Difference = -0.37851, $p = .029$). This suggested that younger learners

(22–29) scored lower in digital literacy compared to older learners (46 and above). There are no statistically significant differences were found among the other age groups (22–29 vs. 30–37, 30–37 vs. 38–45, etc.), as their p -values were all $> .05$. overall older respondents may have developed stronger digital literacy, possibly through professional or life experience, whereas younger respondents might still be in

the process of acquiring applied digital literacy skills. Whereas, in digital communication there are no significant age-based differences were found across any group comparisons (all p -values $> .05$). This indicates that digital communication skills are relatively uniform across age groups, with learners of all ages engaging in online communication at comparable levels. This leads to partially supported H_0^3 .

Findings and Discussion

According to the results, students showed moderate to high agreement on tasks including handling fundamental web operations and utilizing the internet for academic purposes.

According to research like Mahadir et al. (2021) and Suson (2019), which also found that students typically feel confident in fundamental digital operations, this implies that they have functional ICT abilities. The item on removing undesired promotional emails, however, just represents a basic, user-level digital activity and shouldn't be interpreted as having extensive understanding of digital security. Similar research, such as Al-Abdullatif and Gameil (2020), have highlighted that students frequently demonstrate confidence in activities related to digital safety at the surface level but lack a deeper comprehension of topics like data privacy, information authenticity, and cyber-threat prevention. As a result, this result should only be applied to basic email security awareness and understood with caution.

Conclusions

The findings of this research study provideD important insights into undergraduate students' perceived practices related to digital citizenship literacy. It is concluded that overall, distance learners' digital citizenship practices are high and consistent. Distance learners indicated a high level of digital citizenship practices overall ($M = 3.8$, $SD = 0.48$), particularly in communication, law, etiquette, commerce, health and safety, rights and responsibility, and security. Moderate scores in digital literacy and digital access suggest areas needing improvement. Overall, learners are well prepared to engage responsibly and effectively in digital environments.

Recommendations

The study presented the following recommendations:

It is recommended that students be trained to improve their digital literacy, helping them develop basic skills and practice safe and responsible online behavior.

1. It is recommended that there may be integrate digital citizenship training into the LMS (Aaghi Portal) through short interactive modules.
2. There should be a discussion of various cultural concepts, information security,

privacy, and the rights and responsibilities of both technology providers and users when it comes to the measures that must be taken to consider when integrating digital citizenship.

3. It is recommended that distance learners may be guided to practice good digital behavior, promoting responsible actions in communication, commerce, and etiquette.
4. It is recommended that distance education courses may be updated to incorporate and align with government policies on digital citizenship.

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