Digital Citizenship among Saudi Community Colleges' Undergraduates: Reality and Requirements for Enablement

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Abstract

This mixed mode study aims at examining digital citizenship among Saudi university undergraduates at the community college at the University of Tabuk. The objective of the study is manifested in three main axes; first, measuring the Saudi university undergraduates' perceptions of four categories of digital citizenship: *Ethics, Media and Information Literacy, Engagement, and Critical Resistanc*e. Second, investigate points of similarities and differences between male and female participants concerning the aforementioned categories. Lastly, the study explores the potential avenues for digital citizenship enablement within the selected context. 560 (280 females & 280 males) undergraduates participated in the study. Their age varied from 21 to 24 years old. The researchers designed a scale based on Ribble's (2015) and Siemens' (2005) theory of connectivism theoretical framework of digital citizenship. Two research instruments were used to collect data from participants in this study including an online questionnaire survey and an interview for 10 undergraduates (5 males & 5 females). Conducting exploratory factor analysis showed that the questionnaire had discriminant and convergent validity. 72.50% total variance was discussed by the nine applied digital citizenship factors. The findings of the study showed no statistical differences between undergraduates' digital citizenship uses related to gender, educational level, and age. In addition, the results indicated there was a statistical difference between undergraduates' digital citizenship uses credited to their regular practices with electronic devices.

Keywords: digital citizenship, community college at the University of Tabuk, Ribble's dimensions

Introduction

With the development of information communication technology and smart devices lately, the idea of communication has changed intensely (Avcı & Yıldız, 2022). These approaches to communication have shaped a contemporary social structure that controls who communicates and where and when they interconnect. Digital devices provide users with instant reach to anybody in an incredible measure. Present data and networking expertise have rotated the planet into a computer-generated community, permitting societies to reveal their needs, thoughts, concerns, and even dissatisfactions irrespective of topographical site and time. In the academic system, the persistent practice of modern technology has assisted not only to develop individuals' engagement with the virtual domain (Coklar, 2020) but also in making opportunities for online interaction and knowledge transfer (Crockett, 2018).

Though, as modern technologies are used the reformation of technology is embedded, it is not uncommon for students and teachers to exploit or misuse developing information and know-how

services because of the deficiency of awareness and knowledge about respectable behavior concerning the practice of technology (Naidu et al., 2021).

Furthermore, the widespread application of technologies is supported by modern and intimidating moral glitches. New millennials are more involved in the perspectives of their peers currently than ever before. Al-Sulaihat et al. (2018) websites in social media have reduced the isolation of the young generation's lifespan. It transfers them to a public life in which they develop gradually self-satisfied. The technological innovations intended to get the whole world together and turn it into a more cohesive one have therefore downgraded its citizens, particularly the young generation, leaving nations to plan their remedial strategies to adjust to the situation (Al-Mozan, 2018).

The academic system in Saudi Arabia intends to assure that all academic organizations nationwide integrate official, governmental, and representative configurations (Saeed et al., 2014). In an era of prompt technical change, academic institutions are anticipated to consider developing the learners' knowledge. This has subsidized digital citizenship's development in the academic system (Walters & Mohammed, 2019). The official construction of the academic divisions in Saudi Arabia has revealed developments in technological approval, largely through the overview of digital transportation networks.

Therefore, several academic institutions in Saudi Arabia have not been able to explain or reassure digital citizenship in academic settings (Alharbi, 2017). It is vibrant that teachers and students in Saudi Arabia have paid slight effort to accept technology in the academic or learning process, keeping only insignificant steps toward involving the digital academic community. To be specific, academic organizations in Saudi Arabia that display higher education teaching space settings do not have a technological policy to include developing divisions' improvements into the diverse uses of academic organizations (Al-Zahrani, 2015).

To discuss the problem of the study, this project examines the digital citizenship among Saudi University undergraduates at the University of Tabuk in terms of reality and requirements for enablement. The theoretical framework of the study will be based on Ribble's (2015) model of nine dimensions.

Statement of the Problem

In the era of information integration and interaction between different cultures and societies, the goal of education is not limited to acquiring information. It is also concerned with producing/reproducing, expanding, and capitalizing on the information. As evidenced by many studies, digital citizenship is considered a means of serving and facilitating the achievement of these aims (Alqahtani, 2017).

The concept of digital citizenship is related to education as it helps educators, parents, and students understand what they need to know about technology and how to use it appropriately. Therefore, digital citizenship is more than just a learning tool; it is a means of preparing students to be fully involved with society and to become more proactive for the betterment of themselves and their community as a whole (Al-Akkad, 2017).

Moreover, digital citizenship implies educating students about safe and positive involvement with technology. This process would include providing youth with enough learning opportunities in which they are encouraged to enhance their online skills, creativity, and participation, rather than giving the priority to warning against the disadvantages of digital media (Kids Define the Line, 2013). These opportunities occur in formal, informal, and non-formal settings. However, formal education about digital citizenship plays a much bigger role in empowering the youth, and this places a huge responsibility on policymakers to create a suitable framework that is capable of integrating digital citizenship into the educational system (Jones, 2010). This framework is essential for provid-

ing effective learning opportunities to people of any level of education, and equally important, for training educators to prepare their students for global citizenship.

Significance of Study

The result of this study will develop body knowledge in two diverse ways. Firstly, to the best of our knowledge, no research has examined undergraduates' digital citizenship uses at the community college at the University of Tabuk or in the northern region of Saudi Arabia. Therefore, the outcomes will positively inform policymakers in Saudi universities about the merits and demerits of their undergraduates concerning the practices of digital citizenship so that they might be practical in adapting appropriate interferences such as strategies, actions, courses, pieces of training, conferences, and so on that meet undergraduates' requirements.

Secondly, this study pursues to create an effective and dependable scale for digital citizenship dimensions that is appropriate for the Saudi setting. The necessity to examine undergraduates' practices of digital citizenship at the community college at the University of Tabuk results from the reality that there was a significant escalation in internet users during the global crisis and lockdown. Further, in the Saudi setting, Al-Abdullatif et al., (2020) revealed that even though undergraduates have been implementing smart technology over the past 10 years, most of them do not have digital citizenship abilities.

Also, Snyder (2016:p.2) explains "if students are to become productive global citizens who communicate with each other in a highly networked world, then studies are needed to determine how digital citizenship can be leveraged to foster responsible use of technologies for global collaboration, information exchange, and learning". This quote implies that educators need to assume the important role of encouraging students to adopt positive digital engagement and ensure their personal safety and the security of their communities.

However, despite the huge advantages and challenges of current advances in technology and social media tools for individuals as well as society, research on digital awareness of educators and students as well in Saudi Arabia is rather limited and fragmented (Alqahtani, 2017).

Al-Zahrani (2015:p.206) points out that " In the context of Saudi Arabia, there is a clear absent of authentic research devoted to understanding digital citizenship, especially among higher education students". Moreover, according to Nassar (2019), Saudi universities are not responding appropriately to challenges of scientific and technological advances; and they are doing very little to promote intellectual security.

Much research-based evidence is needed to explore the level of knowledge and understanding of digital citizenship among Saudi undergraduate students to inform stakeholders in education to develop policies and measures. This is to ensure that teachers and students are well informed and prepared as technology integration continues to increase in our society and the educational context as well.

The Purpose of Study

The purpose of the proposed study is to measure Saudi university undergraduates' perceptions of four categories of digital citizenship: *Ethics, Media and Information Literacy, Engagement, and Critical Resistanc*e. Additionally, the study seeks to investigate points of similarities and differences between male and female participants in the aforementioned categories. Lastly, this study explores the potential avenues for digital citizenship enablement within the selected context. The framework for this study is informed by Ribble's (2006, 2017b) theory of digital citizenship, Siemens' (2005) theory of connectivism, and theories of digital literacy.

Research Objectives

This study intends to achieve the following objectives.

i.   To examine the extent to which undergraduates at the community college/ the University of Tabuk have digital citizenship skills.

ii.   To analyze whether undergraduates' gender, everyday practice of smart devices, and educational year cause any statistical differences in their digital citizenship skills at Community College/ the University of Tabuk.

Research Questions

This study addresses the following research questions.

1.   To what extent do undergraduates at the community college/ the University of Tabuk have digital citizenship skills?

2.   Do undergraduates' gender, everyday practice of smart devices, and educational year cause any statistical differences in their digital citizenship skills at Community College/ the University of Tabuk?

Review of Literature

Research on digital citizenship issues has developed rapidly over the past decades. Investigation of digital citizenship and information technology locally and globally is one of the more specific areas that have gained prominence (Avcı & Yıldız, 2022). The importance of such research cannot be denied, as digital citizenship knowledge can be a helpful insight to provide solutions to digital citizenship based-problems (Ribble, 2015). In the investigation of digital citizenship college undergraduates, many approaches have been adapted and adopted to investigate digital citizenship to provide a solution to digital citizenship problems such as developing undergraduates' skills, abilities, readiness, and competence, so that they can do a lot to promote intellectual security (Fernández et al., 2021).

Digital Citizenship

Digital citizenship is defined in scholarly work as values of behavior about the practice of technology (Ribble, 2015). Snyder (2016) defined digital citizenship as a righteous, ethical, and answerable use of technology to pledge the security of one's self and others while functioning together in a developing technological, incorporated, and globalized world.

Digital citizenship, occasionally known as citizenship, includes incessant experience in the effective practice of media platforms that need several settings, such as the presence of internet admission, the availability of computer systems or devices, the willingness to practice up-to-date technology, and understanding skills to measure the reliability of the data collected online (Isman & Canan Gungoren, 2014).

At its core, digital citizenship pursues not only to offer young people assets and an ethical framework to keep accountable choices in the online domain but also to support prospect security and allow expressive contact through social media. Based on Ribble's model, the critical objective of digital citizenship is to support each individual in a country with a positive degree of information about the hazards and exposures, as well as the reimbursements, of being a digital citizen in a related society (Ribble, 2012).

Ribble's Model of Digital Citizenship

Ribble (2015) suggested instructing digital citizenship based on the REP principles: *respect, educate,* and *protect.* These features make the basis for the acknowledgment and understanding of digital citizenship. The comprehensive description of REP supports demonstrating and showing the ideas of digital citizenship, which comprise etiquette, convenience, law, connectivity, knowledge, market, concern and answerability, security, fitness, and happiness.

Every one of the three REP system classes has three ideas that explain appropriate conduct in the connected world (Walters et al., 2019), provoking a necessity to confer these groups and notions in more depth. The present research suggests that the REP construction can be applied in educational situations to develop acceptance of standards that demonstrate an amiable and responsible practice of smart devices to share knowledge (Kim & Choi, 2018).

The first group, respect, includes the themes of etiquette (electronic rules or procedures), access (full digital involvement in society), and law (electronic accountability for acts and behaviors) (Ribble, 2015).

Studies have recurrently established that raised levels of personal internet attitude and machine self-efficiency have developed the readiness of technology clients to rate themselves and others online by viewing better mechanisms and liability for their performances (Kim & Choi, 2018).

In their study, Lawrence and Calhoun (2013) observed that respect was an acute point for students and professors contributing in digital settings, as it emphasized the importance of respect for personalities, ethnicities, and human equality. Certainly, research showed that regard, mainly for others, is serious in digital societies as it is much humbler to disrupt the liberty of others as a consequence of ICT developments (Al Zahrani, 2015). The second group, education, involves electronic interaction, literacy, and the use of new tech), e-commerce and the sale of goods.

Al-Zahrani (2015) found that students who possess more computer expertise were more involved in self-education and interaction events than students with less experience. Tech literacy, expertise, understanding, and experience have great contributions to ensuring that operators are talented to interact and share knowledge in an online setting.

The third category, protect, comprises the rights theories, security, wellness, and well-being. Simsek and Simsek (2013) showed that students with greater monthly average technology practice choose to secure themselves and others in computer-generated situations more than peers with lower monthly average technology practice do as shown in Figure (1) in the next section.
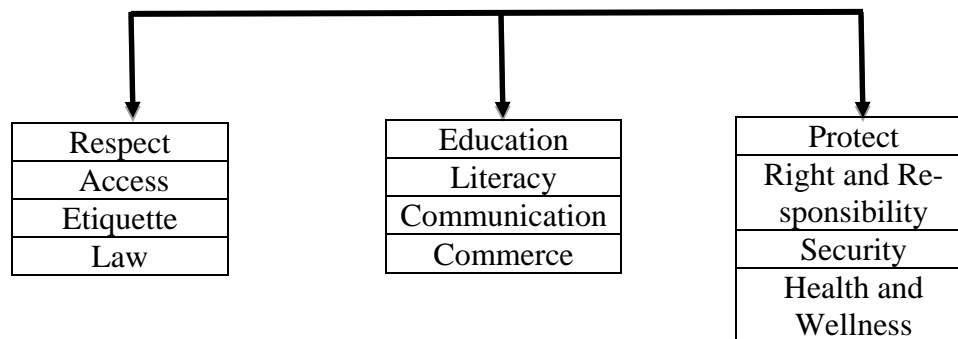
Figure 1. The Nine Dimensions of Digital Citizenship Skills

Past Studies on Digital Citizenship
This section reviews related research on digital citizenship and its contributions. Walters and Mohammed (2019) examined digital citizenship and the elementary educator. The study analyzed what researchers have considered in connection to teachers' practices of technology connecting to digital citizenship. The results showed that the knowledge, beliefs, and professional uses of teachers determine what gaps happen to know what requirements to be discussed in supporting digital citizenship teaching in making learners use technology correctly, sensibly, and ethically.

Also, Coklar and Tatli (2020) evaluated the digital citizenship levels of teachers in the context of information literacy and internet and computer use self-efficacy. The sample involves 161

teachers working in a district of Gaziantep province in the 2016-2017 academic years. The Digital Citizenship Scale prepared by Isman and Gungoren (2014), the Information Literacy Scale prepared by Adiguzel (2011), and the Self-Efficacy Perception Scale prepared by Sad and Demir (2015) were used in the scope of the research. The results showed that teachers' level of digital citizenship is medium. While the digital citizenship levels of teachers do not vary based on the educational institution level, they diverge according to the age range. It was concluded that there was a positive, significant, and middle-level relationship between teachers' digital citizenship and information literacy and internet-computer use self-efficacy levels. In terms of digital citizenship level, information literacy explains 44% of the total variance, while internet and computer self-efficacy explains 31% of the variance alone.

Additionally, Naidu et al., (2021) investigated Digital citizenship skills among undergraduate students in Malaysia at the Sultan Idris Education University, Perak, Malaysia. 1000 participants from nine different faculties participated in this study. The results showed that of the study showed that the level of digital citizenship skills of students is at a high level. This study is estimated to support stakeholders to highlight the study of digital citizenship and digital citizenship education in Malaysia in more detail.

Furthermore, Fernández et al., (2021) measured digital citizenship to show a state of art about digital citizenship from the methodological point of view when it comes to measuring this construct. 366 university students participated in this study to analyze their psychometric properties and the existing coincidences and divergences between the three. Findings indicated that not all of the items seem to measure the same construct, due to its diversity of dimensions. This reveals an urgent need to agree globally on a description of digital citizenship with its conforming dimensions to elaborate a reliable and valid measuring instrument.

Similarly, Avcı and Yıldız (2022) examined digital citizenship, online information searching strategy, and information literacy depending on changing state of experience in using digital technologies during the COVID-19 pandemic. The study was conducted with the participation of 255 university students. The results of the study showed that the students with a higher level of information literacy and online information searching strategies may help them develop digital citizenship awareness.

In conclusion, the researcher agrees with the above-discussed studies that awareness, competency, skills, intellectual security, and readiness are important factors in developing digital citizenship.

In addition, any sort of investigation should always start with digital skills and intellectual security as they contain the basic meaning in the development of digital citizenship (Naidu et al., 2021). The researcher also observes that many research studies (Netsafe, 2016; eTwinning 2016; Ferrari 2013; Parker and Fraillon, 2016; UNESCO 2015; OECD, 2016; Meyers, Erickson and Small 2013; Martens and Hobbs 2015; Frau-Meigs, O'Neill, Soriani, & Tomé, 2017) adopt both Ribble's (2015) and Siemens' (2005) theory of connectivism theoretical framework of digital citizenship. Although many studies examined digital citizenship, no research has examined undergraduates' digital citizenship uses at the community college at the University of Tabuk or in the northern region of Saudi Arabia.

Methodology

The study employs a mixed-method research approach and a sequential triangulation research design to explore Saudi undergraduate university students' perceptions of their current knowledge and comprehension of digital citizenship. In a mixed-method approach, the researchers chose

to not only base their findings on pragmatic underpinnings such as consequence-oriented, problem-centered, and pluralistic perspectives, but also to employ strategies of inquiry that involve gathering field data to understand existing research problems properly (Creswell, 2009). A mixed methods approach was selected for this study due to its ability to provide multiple insights on digital citizenship through the collection of qualitative and quantitative data to draw on the strengths of both traditions of inquiry. The study design gave equal importance to the qualitative and quantitative data to gain an overall insight into Saudi undergraduate students' understanding of digital citizenship.

The quantitative data collection tool that is used in this study is a survey developed by the researchers. Its purpose is to collect appropriate statistical data that can be used to investigate the scope of digital citizenship as exhibited by Saudi undergraduate students. The survey is constructed based on the works of several researchers (e.g., Chio, 2015; Nasser, 2019; Al-Zahrani, 2015). In the context of this study, the survey design adopted by the researchers provides an enabling framework through which quantitative self-report data on digital citizenship awareness is collected using a questionnaire and analyzed using independent-measures t values, a single-factor, independent-measures analysis of variance (ANOVA), and the chi-square test for independence. The researchers used these types of tests to compare several variables of the study.

As for qualitative data collection, an interview procedure will be used to identify the perceptions of digital citizenship among Saudi undergraduate students based on the requirements of the study questions. Ten interviews, online and face-to-face, will be conducted with male and female participants to explore their perceptions of digital citizenship based on the four identified categories of digital citizenship. The administration of the semi-structured interviews will help the researchers collect textual data which will be coded and thematically analyzed.

Participants

The quantitative part of the study included a larger sample with many characteristics to be identified. The participants of the quantitative research were 560 undergraduate university students from the community college at Tabuk University. They will be invited to participate in the study voluntarily. There will be 280 female and 280 male students, and their overall age is between 21 and 24 years. As for the qualitative part of the study, there will be ten participants: 5 male and 5 female students from the community college at Tabuk University. The information they will offer will be treated as confidential, and no names or direct places of work/ residence will be mentioned in the study.

The Community College at the University of Tabuk 2022/2023

The Community College at the University of Tabuk was founded in 2006 to provide training services to schoolteachers nationwide. The college achieved international and institutional academic accreditation for many academic programs throughout the year 2015. 2016, 2017, and 2018. Undergraduates at the community college face difficulties connected with the use of the internet and the incorporation of technological assessment at this academic institution because of the need for technology infrastructure and faculty members' attitudes toward using such technology (Al Zebidi, 2016).

Utilization

The study derives its importance from its findings, which are expected to help in:

- Having a better understanding of the Saudi undergraduates' awareness and perceptions about Digital citizenship.
- Explores the potential avenues for digital citizenship enablement.
- Assess any potential effects on digital citizenship because of the gender variable.

Research Instruments

This mixed mode research was designed to analyze the digital citizenship among Saudi university undergraduates in terms of reality and requirements for enablement. Two research instruments were used to elicit data from participants; the questionnaire and a semi-structured interview. The questionnaire was selected as a suitable tool to achieve data about undergraduates' views, approaches, values, and conducts and to access a great number of undergraduates or participants (Johnson & Christensen, 2014)

The items of the survey implemented in this research were related to Ribble's (2015) model. It included 35 items distributed over Ribble's (2015) nine dimensions. The 4-point Likert scale questionnaire varied from strongly disagree to strongly agree (Strongly Disagree (SD, hereafter) =1; Disagree (D, hereafter)= 2; Agree (A, hereafter)= 3; and Strongly Agree (SA, hereafter) = 4). The main cause, the Likert scale mid-point was not included was that undergraduates were anticipated to have an attitude concerning their use of digital citizenship (Ducharme, 2014).

During the construction and validation of the survey, the questionnaire was directed to the undergraduates. To have access to a great number of community college undergraduates, WhatsApp was also referred to as a connection platform. 560 (280 females & 280 males) accomplished the task (questionnaire), varying in age from 21 to 24 years. Table (1) in the next section displays all elicited demographic data about the sample.

Table 1. Distribution of Undergraduates' Demographics Data

Demographic Data		Frequency
Gender	Male Undergraduates	280
	Female Undergraduates	280
	Total	560
Educational Level	1st Year	112
	2nd Year	218
	3rd Year	142
	4th Year	88
	Total	560
Use of Smart Device Daily	Less than One Hour	98
	1 to 3 Hours or Less	102
	3 to Hours or Less	173
	6 Hours and More	187
	Total	560
Discipline	Art Education	97
	Arabic	80
	Islamic Studies	103
	Chemistry	117
	Mathematics	73
	Physics	70
	Physical & Health Education	20
	Total	560
Social Media Account	Yes	490
	No	70
	Total	560

Research Tools Validity

To achieve the validity of the questionnaire, the items were judged by a panel of experts in the area of digital citizenship, and some changes were done to the questionnaire in line with the panel's judgment, suggestions, and comments. To check the convergent and discriminant validity, the researchers applied *Exploratory Factor Analysis* (EFA) (Ul Hadia et al., 2016).

Concerning convergent validity, the entire objects in a single factor were significantly weighed down. Thus, objects with low weight (< 0.4) were deleted, based on Stevens' (2009) concept. Additionally, to confirm discernment validity, objects with cross-loading were removed. Factor correlation was analyzed, and the correlation between objects has not exceeded 0.58, which showed that the objects were not correlated, and, thus, discernment validity was attained, as depicted in Table (2).

Table 2. Items' Factor Correlation Analysis

Component	1	2	3	4	5	6	7	8	9
1	1000	.231	.230	.364	.003-	.350	.306	.214	.278
2	.232	1000	.454	.391	.590	.325	.457	.522	.342
3	.231	.454	.1000	.346	.404	.270	.390	.527	.341
4	.364	.391	.346	1000	.265	.304	.419	.308	.361
5	.002-	.590	.404	.265	1.000	.251	.364	.505	.353
6	.350	.325	.270	.304	.251	1000	.414	.381	.311
7	.306	.457	.390	.419	.364	.414	1000	.397	.461
8	.214	.522	.527	.308	.505	.381	.397	.1.000	.392
9	.278	.342	.341	.361	.353	.311	.461	.392	1.000

To confirm each object loaded on the predictable factor appropriately, principal component analysis (PCA) with Promax rotation, identifying the nine removed factors, was carried out many times to achieve the best model fit. Objects with cross-loading or low loading (< 0.4) were erased based on Stevens' (2009) notion. The nine extracted factors described 70.50% of the entire variance. The Kaiser-Meyer-Olkin (KMO) evaluation of sampling adequacy was 0.900, Bartlett's measure was significant, and communalities varied between 0.50 and 0.84 that showed that the EFA performance was wonderful (Hair et al., 2010), as shown in Table (3). Table (4) also displays the pattern matrix.

Table 3. Bartlett and KMO's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.900
Bartlett's Test of Sphericity	Approx. Chi-Square	5510.758
	df	629
	Sig	.000

Table 4. The Pattern Matrix

Item	Component									Communalities
	D4	D5	D8	D2	D6	D9	D3	D7	D1	Extraction
D1_1									.643	.504
D1_2									.823	.724
D1_3									.533	.625

Item	Component									Communalities
	D4	D5	D8	D2	D6	D9	D3	D7	D1	Extraction
D2_1				.528						.608
D2_2				.801						.765
D2_3				.836						.753
D2_4				.797						.733
D3_1							.775			.714
D3_2							.883			.738
D3_3							.669			.665
D4_1	.775									.656
D4_2	.789									.735
D4_3	.753									.724
D4_4	.544									.769
D4_5	.724									.769
D5_1		.750								.692
D5_2		.772								.652
D5_3		.737								.741
D5_4		.752								.729
D5_5		.679								.751
D6_1					.989					.846
D6_2					.957					.850
D6_3					.537					.695
D7_1								.757		.646
D7_2								.577		.674
D7_3								.725		.573
D7_4								.645		.690
D8_1			.542							.658
D8_2			.600							.595
D8_3			.809							.710
D8_4			.892							.735
D8_5			.559							.590
D9_1						.671				.652
D9_2						.834				.759
D9_3						.776				.717
Extraction Method: Principal Component Analysis.										
Rotation Method: Promax with Kaiser Normalization.										
a. Rotation converged in 8 iterations.										

Research Tools' Reliability

To check the reliability of the questionnaire's items, a Cronbach's alpha value bigger than 0.7 was measured as satisfactory. In this research, Cronbach's alpha for the scale was 0.94, and Cronbach's alphas for every dimension varied from 0.66 to 0.87. Only eight constructs represented Cronbach's alphas bigger than 0.7. Therefore, Cronbach's alpha for the digital access construct was 0.66, which was less than the proposed 0.7 thresholds. One conceivable description is that showing few items to exemplify the digital access construct results in low Cronbach's alpha levels (Field,

2009). Though the digital access constructs showed Cronbach's alphas of less than 0.7, some scholars contend that an alpha of 0.6 is satisfactory in an exploratory study (Hair et al., 2010). Table 5 displays Cronbach's alpha values for the whole constructs.

Results
This section of the study discusses the analysis of the data. It includes both the quantitative and qualitative data sections.

1.   *Quantitative Data*
In an attempt to address the first study question, the quantitative analysis of the data showed that Community College Undergraduates at the University of Tabuk have knowledge and awareness of the utility of the nine dimensions of digital skills. The extent value of the nine dimensions varied from 2.91 to 3.61 out of 4. The results of the analysis showed that the nine dimensions appeared to possess greater mean scores, as their answers were mostly "strongly agree," whilst digital literacy showed a tendency toward "Agree" as depicted in Table (6).

Table 5. Digital Citizenship Constructs / Cronbach's Alpha

Digital Constructs	Cronbach's Alpha	No of Items	Mean	Std. Deviation	Description
D1: Access	.65	4	3.24	0.62	SA
D2: Commerce	.83	3	3.26	0.67	SA
D3: Communication	.77	3	3.44	0.56	SA
D4: Literacy	.86	5	2.89	0.69	A
D5: Etiquette	.86	3	3.52	0.48	SA
D6: Law	.85	5	3.59	0.57	SA
D7: Right & Responsibility	.76	4	3.54	0.48	SA
D8: Health & Wellness	.81	5	3.37	0.55	SA
D9: Security	.74	3	3.42	0.61	SA

Table 6. Undergraduates' Responses on the Nine Dimensions of Digital Citizenships

D1: Access	SD	D	A	SA	Mean	SD
I owe a smart digital device, whether a PC or a laptop, to do my homework and surf the Internet (D1-1).	28	56	224	252	3.20	.82
I possess an Internet that allows me to use the Internet to carry out my educational tasks, such as accessing the university's electronic portal, registration, and withdrawal. (D1-2)	26	44	224	266	3.25	.80
I know to log into the blackboard system, review and download scientific content, and upload assignments. (D1-3)	28	30	232	270	3.28	.79
D2: Commerce	SD	D	A	SA	Mean	SD
I have awareness of the purchase and payment essentials when using bank cards. (D2-1)	18	94	192	256	3.17	.83
I sensibly read the rules of commercial sites before purchasing from them, such as the return, exchange, and warranty policies.(D2-2)	30	70	198	262	3.18	.86

	SD	D	A	SA	Mean	SD
I confirm the website I want to buy from is dependable by inspecting whether it is itemized on the Maroof website affiliated with the Saudi Ministry of Commerce. (D2-3)	26	90	192	252	3.35	.80
I match the prices of goods on many websites so that I get the best price from a safe website. (D2-4)	27	77	203	253	3.35	.79
D3: Communication	**SD**	**D**	**A**	**SA**	**Mean**	**SD**
I have the skill to handle digital communication media like Facebook, Twitter, WhatsApp, and Snapchat. (D3-1)	28	32	184	316	3.55	.62
I practice instant messaging and/or sending emails willfully and responsibly. (D3-2).	27	57	224	252	3.32	.75
I surf social media platforms (WhatsApp, Snapchat, Instagram, etc.) to search for knowledge, share ideas, and learn. (D3-3)	25	36	333	166	3.44	.65
D4: Literacy	SD	D	A	SA	**Mean**	SD
I contribute to training courses concerning computer skills and their application. (D4-1)	82	66	186	226	2.43	0.95
I observe scholastic videos and tutorials on how to use various digital presentations. (D4-2)	51	69	234	206	2.91	0.87
I take advantage of the e-courses available on digital platforms such as IEN, Rwaq, Duroob, and Edraak. (D4-3).	77	93	208	182	2.79	0.93
The community college promotes a culture of benefiting from digital technology. (D4-4)	30	87	254	189	2.79	0.77
Community College curricula help me shape my digital culture. (D4-5)	33	73	244	210	3.13	0.80
D5: Etiquette	**SD**	**D**	**A**	**SA**	**Mean**	**SD**
I select an appropriate time when I want to interact with others. (D5-1).	18	48	220	274	3.38	0.70
I cann ot get unfocused by my Smartphone throughout lecture time. (D5-2)	8	39	218	295	3.46	0.62
I apply polite phrases while I interact with others on digital devices. (D5-3).	6	12	158	384	3.58	0.53
I evaluate applications' guidelines and comprehend what the suitable and inappropriate behaviors are before joining any group on social media or record keeping on any digital application. (D5-4).	9	25	210	316	3.52	0.59
I follow ethical values and good conduct when using digital technologies. (D5-5)	7	14	236	303	3.65	0.50
D6: Law	**SD**	**D**	**A**	**SA**	**Mean**	**SD**
I do not drudge other folks' digital devices. (D6-1).	24	36	168	332	3.57	.69
D3: Communication	**SD**	**D**	**A**	**SA**	**Mean**	**SD**
I can deal with digital communication media like Facebook, Twitter WhatsApp, and Snapchat. (D3-1).	10	24	202	324	3.56	.63
I implement prompt messaging and/or send emails knowingly and responsibly. (D3-2)	27	57	224	252	3.32	.75
I apply social media platforms (WhatsApp, Snapchat, Insta-	29	57	223	251	3.44	.65

gram, Etc.) to search for knowledge, share ideas, and learn. (D3-3)						
D4: Literacy	**SD**	**D**	**A**	**SA**	**Mean**	**SD**
I contribute to training courses concerning computer skills and their application. (D4-1)	82	226	144	108	2.43	0.95
I observe academic videos and tutorials on how to use various digital applications. (D4-2)	38	110	234	178	2.91	0.87
I get benefits from the e-courses accessible on digital platforms such as IEN, Rwaq, Duroob, and Edraak. (D4-3)	81	134	208	137	2.78	0.92
The community college encourages a culture of benefiting from digital technology. (D4-4)	20	58	254	332	2.77	0.76
Community College's curricula help me shape my digital culture. (D4-5)	22	74	244	220	3.12	0.79
D5: Etiquette	**SD**	**D**	**A**	**SA**	**Mean**	**SD**
I select an appropriate time when I want to interact with others. (D5-1)	12	48	222	278	3.38	0.70
My smart device does not divert me during class time. (D5-2)	8	39	218	295	3.46	0.62
I apply polite phrases while I interact with others on smart devices. (D5-3)	7	16	226	311	3.58	0.53
I evaluate applications' rules and comprehend what the proper and unsuitable behaviors are before joining any group on social media or digital applications. (D5-4)	9	28	208	315	3.53	0.60
I follow ethical principles and good conduct when using digital technologies. (D5-5).	12	36	258	306	3.65	0.50
D6: Law	**SD**	**D**	**A**	**SA**	**Mean**	**SD**
I never break into other people's smart devices. (D6-1)	24	27	270	239	3.57	.69
I never practice hacking software and malware. (D6-2)	24	28	276	232	3.58	.69
I follow digital websites' conventional use policies. (D6-3)	20	23	255	262	3.63	0.53
D7: Rights and Responsibility	**SD**	**D**	**A**	**SA**	**Mean**	**SD**
I report an impersonation, threat, or misapplication of smart technologies.(D7-1)	24	39	221	284	3.38	.71
I practice digital technologies ethically. (D7-2)	12	21	264	297	3.59	.58
I never use digital technology to cheat on tests (D7-3).	16	28	258	302	3.57	.61
I elude using suspicious websites on the Internet. (D7-4)	18	21	248	273	3.61	.58
D8: Health and Wellness	**SD**	**D**	**A**	**SA**	**Mean**	**SD**
I have awareness of the undesirable influence that protracted use of technology and digital games can have, such as addiction, moodiness, and social isolation. (D8-1).	29	36	255	240	3.55	.63
I follow an appropriate and healthy sitting position when using digital devices. (D8-2)	30	84	206	240	3.18	.83
I rest sometimes while using digital devices. (D8-3)	24	58	212	266	3.38	.71
I regulate the location of the screen of the electronic device to be at my eye level. (D8-5)	23	39	210	288	3.45	.65

D9: Security	SD	D	A	SA	Mean	SD
I apply a resilient password to shield my accounts on the Internet and change it frequently. (D9-1).	18	27	253	262	3.58	.62
I frequently update my electronic device's operating system, software, and applications. (D9- 2)	24	46	176	314	3.47	.70
I apply antivirus software to my digital devices. (D9-3)	36	64	179	281	3.21	.89

Additionally, the results of the quantitative analysis in addressing the second research question, the researcher conducted an independent sample test (ONE-WAY) ANOVA to analyze if educational level, gender, and the daily practice of smart devices affect undergraduates' digital citizenship use. Concerning the effect of gender on the use of digital citizenship, the findings indicated that there was no significant difference based on the answers of male and female undergraduates throughout the nine dimensions as depicted in Table (7).

Table 7. The Nine Dimensions of Digital Citizenship T-test and Descriptive Statistics based on Undergraduates' Gender

Dimensions	Group				95%CIf or MD	t	df	p
	Male		Female					
	M	SD	M	SD				
D1: Access	3.245	0.646	3.256	0.610	-0.010	-0.146	560	.882
D2: Commerce	3.317	0.711	3.222	0.654	0.093	1.119	560	.263
D3: Communication	3.438	0.586	3.454	0.556	-0.016	-0.239	560	.810
D4: Literacy	2.965	0.746	2.822	2.822	0.143	1.667	560	.096
D5: Etiquette	3.533	0.530	3.521	0.436	0.011	0.194	560	.844
D6: Law	3.638	0.520	3.561	0.629	0.076	1.077	560	.281
D7: Right & Responsibility	3.569	0.507	3.524	0.472	0.044	0.739	560	.459
D8: Health & Wellness	3.405	0.572	3.358	0.537	0.046	0.689	560	.490
D9: Security	3.443	0.653	3.421	0.582	0.020	0.277	560	.780

Concerning undergraduates' educational level, the researcher conducted a ONE-WAY ANOVA to see the effect of the educational level on the use or practice of digital citizenship dimensions. The results of the quantitative analysis indicated that there were no statistically significant differences based on the undergraduates' year of study (1st, 2nd, 3rd, and 4th Year) concerning the practice of digital citizenship throughout all the nine dimensions as depicted in Table (8) in the next section.

Table 8. One-Way ANOVA Analysis of the Undergraduates' Responses to Digital Citizenship Dimensions based on the Educational Level (Year of Study; 1st, 2nd, 3rd, and 4th).

The Nine Dimension		Sum of	df	Mean Square	F	Sig.
D1: Access	Between Groups	1.941	3	.646	1.650	.177
	Within Groups	101.945	560	.391		
	Total	103.886	560			

The Nine Dimension		Sum of	df	Mean Square	F	Sig.
D2: Commerce	Between Groups	1.811	3	.603	1.291	.277
	Within Groups	121.572	560	.467		
	Total	123.383	560			
D3: Communication	Between Groups	.276	3	.091	.280	.838
	Within Groups	85.424	560	.328		
	Total	85.700	560			
D4: Literacy	Between Groups	1.931	3	.643	1.303	.273
	Within Groups	128.382	560	.493		
	Total	130.313	560			
D5: Etiquette	Between Groups	.304	3	.101	.427	.732
	Within Groups	61.727	560	.236		
	Total	62.031	560			
D6: Law	Between Groups	.394	3	.131	.391	.758
	Within Groups	87.355	560	.335		
	Total	87.749	560			
D7: Right & Responsibility	Between Groups	.432	3	.143	.596	.616
	Within Groups	62.849	560	.241		
	Total	63.281	560			
D8: Health & Wellness	Between Groups	.422	3	.140	.453	.713
	Within Groups	80.656	560	.309		
	Total	81.078	560			
D9: Security	Between Groups	.498	3	.165		
	Within Groups	100.095	560	.384	.431	.729
	Total	100.594	560			

The researcher conducted a ONE-WAY analysis test to analyze whether undergraduates' routine practice of E-devices showed an effect on their digital citizens' nine dimensions uses. The findings indicate that the F-Value of the ONE-WAY ANOVA analysis was merely statistically significant for the digital commerce dimension ($F_{(3, 260)} = 3.415$, $p < .05$) as depicted in Table (9). This shows there was a statistically significant difference between undergraduates' digital commerce dimension based on their usual practice of E-devices.

Table 9. One-Way ANOVA Analysis of the Variation in the Undergraduates' Responses on the Digital Citizenships' Dimensions Practices based on Daily Practices of E-devices

Digital Dimensions		Sum of Squares	df	Mean Square	F	Sig.
D1: Access	Between Groups	1.444	3	.481	1.222	.301
	Within Groups	102.442	560	.393		
	Total	103.886	560			
D2: Commerce	Between Groups	4.676	3	1.558	3.414	.017
	Within Groups	118.706	560	.456		
	Total	123.384	560			
D3: Communication	Between Groups	.470	3	.156	.478	.696
	Within Groups	85.230	560	.327		
	Total	85.700	560			
D4: Literacy	Between Groups	.302	3	.100	.201	.894
	Within Groups	130.010	560	.500		
	Total	130.313	560			
D5: Etiquette	Between Groups	.093	3	.030	.130	.941
	Within Groups	61.938	560	.238		
	Total	62.031	560			
D6: Law	Between Groups	1.756	3	.585	1.770	.152
	Within Groups	85.993	560	.330		
	Total	87.749	560			
D7: Right & Responsibility	Between Groups	.280	3	.093	.386	.761
	Within Groups	63.001	560	.241		
	Total	63.281	560			
D8: Health & Wellness	Between Groups	.136	3	.045	.145	.931
	Within Groups	80.942	560	.310		
	Total	81.078	560			
D9: Security	Between Groups	.207	3	.068	.179	.909
	Within Groups	100.386	560	.387		
	Total	100.594	560			

Based on Tukey's test, the analysis indicated that statistical difference in the use of digital commerce of undergraduates who applied E-devices for less than one hour and undergraduates who applied them for one to three hours; the findings were in favor of the latter. Further, the findings showed statistical differences in the digital commerce dimension uses of undergraduates who ap-

plied E-devices for less than an hour and undergraduates who practiced them for three to six hours; the findings were in favor of the latter group.

Table 10. Digital Commerce Uses based on Tukey HSD

Hourly- Daily Practice of E- Device	Hourly- Daily Practice of E- Devices	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Less than 1 Hour	From 1 hour to less than 3 hours	-.72044-*	.25567	.026	-1.3815-	-.0592-
	From 3 hours to less than 6 hours	-.72448-*	.24844	.021	-1.3668-	-.0820-
	More than 6 hours	-.58130-	.24801	.090	-1.2225-	.0598
1 – 3 Hours to Less	Less than 1 hour	.72044*	.25567	.026	.0592	1.3815
	From 3 hours to less than 6 hours	-.00403-	.11383	1.000	-.2983-	.2902
	More than 6 hours	.13913	.11283	.605	-.1525-	.4308
3- 6 Hours to Less	Less than 1 hour	.72448*	.24844	.021	.0820	1.3668
	From 1 hour to less than 3 hours	.00403	.11383	1.000	-.2902-	.2983
	More than 6 hours	.14317	.09534	.437	-.1033-	.3896
6 Hours or More	Less than 1 hour	.58130	.24801	.090	-.0598-	1.2225
	From 1 hour to less than 3 hours	-.13913-	.11283	.605	-.4308-	.1525
	From 3 hours to less than 6 hours	-.14317-	.09534	.437	-.3896-	.1033

2. *Qualitative Data*

The average age of the participants in this study is between 21 and 24 years. When asked to talk about their practice, use, and significance of digital citizenship in the learning process, the 10 undergraduates stated that generally, students at the Community College at the University of Tabuk lack the awareness of the use of digital citizenship, which may be a comparable case for the rest of undergraduates in other Saudi community colleges (Al-Zahrani, 2015).

They added that undergraduates are not exposed much to the practice of digital citizenship in a classroom setting. Additionally, they stated that classroom teachers are not aware of new models in digital citizenship practice, as they still incline to use outdated methods in the classroom.

The interviews showed that the 10 undergraduates possess differences and similarities in their approach to practicing digital citizenship in the classroom. They are both very much concerned about the development of their digital citizenship practice and highlighted that they encountered many difficulties in using the digital citizenship approach. They connected these problems to several factors such as insufficient practice, limited access to digital citizenship, and a conservative learning environment that encourage a traditional learning approach for classroom practices.

To conclude, the findings of the qualitative semi-structured interview with the ten undergraduates show that there is a necessity for enhancing their undergraduates' digital citizenship. They emphasized that students and be aware of the significance of new digital citizenship practices and applications. They recommend undergraduates should be trained on how to use and apply new practices of digital citizenship and these can be incorporated into classroom learning materials.

Discussion

This research intended to analyze the extent to which undergraduates at the Community College at the University of Tabuk master digital citizenship abilities grounded on Ribble's (2015) nine dimensions citizenship model. One more feature of this research project was to authenticate Ribble's (2015) nine dimensions framework. The results of the analysis showed that Ribble's (2015) nine dimensions model of the undergraduates at the community college fulfilled law, connectivity, literacy, commerce, responsibility and accountability, protection or security, etiquette, accessibility, and health and wellbeing.

These results may be related to the endless need for using and incorporating academic aids into the teaching-learning cycle (Al-Abdullatif & Gameil, 2020). Community College is an affiliated academic institute to the University of Tabuk in Saudi Arabia that is a governmental organization monitored by the higher ministry of education, which is funded by the government body and operates in harmony with other public sectors statewide. This attempts to achieve the objectives underpinned by the Saudi 2030 Vision that focuses on the significance of developing the education sector locally, regionally, and globally (KSA Government, 2022). Lately, public universities, in Saudi Arabia, have conducted many seminars, conferences, training sessions, and workshops to acquaint and familiarize teachers and students with the application and uses of educational technology for succeeding in the learning process and compete with global schools and universities (Albugami & Ahmed, 2015; Alghamdi & Holland, 2020).

Further, learners are very aware of the use and application of smart devices, laptops, and serving the internet as they utilize such techniques in their life cycle daily (Wilson et al., 2011; Avcı et al., 2022). As a result, students at the Community College at the University of Tabuk accept Ribble's (2015) nine dimensions of digital citizenship skills. These findings agree with past studies' conclusions (Kara, 2018; Coklar, 2020).

In this project, the researchers confirmed Ribble's (2015) dimensions of digital citizenship framework achieved by generating a scale dependent on past research that subsidizes a detailed evaluation of this model. The recommended scale was authenticated and confirmed through the assessment of a panel of professionals in the area and by an EFA (refer to Table.3).

The analysis of the EFA indicated that all the items on the scale were very loaded, weighed, and classified with all the nine dimensions of digital skills proposed by Ribble's (2015) framework, showing a 0.5 score. This suggests a chance for future investigations and paves the way for scholars to reuse the recommended scale in different research settings. Additionally, the reliability of the given survey (questionnaire items) was achieved as revealed in Table (2) depicted in the previous sections earlier in this study. Such results agree with and confirm Isman et al., (2014) findings in their study on digital citizenship. This project also showed no statistical differences between undergraduates' digital citizenship skills about sex or gender.

To be more specific, male and female undergraduates in Saudi Arabia, possess equal rights and chances to use and apply technologies (smart devices, computers, projectors, and smartphones) as a reference in their daily classes and learning cycle (Al-Shawi et al., 2013; Fernández et al., 2021). Therefore, this conclusion is similar to those of past research findings that indicated no statis-

tical differences in digital citizenship skills based on learners' gender (Erdem et al., 2019). However, the conclusions of this research concerning the variable of gender contrast the results of some other studies (Kocadağ, 2012; Som Vural & Kurt, 2018).

Comparable findings concerning differences between students as related to educational levels and age. Students of similar age and academic levels were revealed to use and possess digital citizenship skills. To conclude, routine practice of smart device variables contributed to students' use of digital citizenship skills; undergraduates who were familiar and aware of the use of smart devices were much more fluent and professional in digital citizenship because they possessed more expertise concerning digital concerns and the use of digital citizenship. This is because they possessed greater knowledge and knowledge of digital problems than those who used digital citizenship in a lesser time on smart devices.

Conclusion

This research project intended to analyze the extent to which undergraduates at the Community College at the University of Tabuk have utilized digital citizenship skills lately, particularly during past crises or pandemics. Undergraduates showed the greater utility of every dimension of Ribble's (2015) framework of digital citizenship. Further, a scale of 35 items found in the questionnaire was constructed for this research, which depicts all nine dimensions of digital citizenship. The research instruments were defined to be reliable and valid. This is because EFA indicated that all the 35 items and nine dimensions indicated that all the objects were loaded and prepared in every factor of Ribble's (2015) digital dimensions model.

Therefore, this research offers a contemporary scale of digital citizenship as related to past research. This scale can be used in further future research, and its reliability and validity can be checked in varied contexts. Additionally, this research affirms that variables such as educational level, gender, and age of the undergraduates do not influence Saudi undergraduates' digital citizenship skills; though, there is a connection between the everyday practice of smart devices and digital citizenship level use. To conclude, since undergraduates are aware of nowadays challenges and practice of the internet has developed to be a part of personal subsists, which calls on educational organizations should offer seminars, training sessions, conferences, and workshops on digital citizenship skills for their learners and teachers which helps them improve their attentiveness and accepting smart devices in the learning process.

Funding

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