

# Digital competence and practices on digital citizenship of the college freshmen at Laguna University

Rosalie Delantes Buban, EdD<sup>a</sup>, Mayra Christina Mirandilla Ambrocio, DEM<sup>b</sup>  
Olga Jara Domingo, PhD<sup>c</sup>, Rosemarie Bagsit Alon-alon, EdD<sup>d</sup>

<sup>a</sup>roseerbuban@gmail.com, <sup>b</sup>mcmambrocio@gmail.com, <sup>c</sup>domingoolga1217@gmail.com, <sup>d</sup>rosabagsit@gmail.com  
Laguna University, Laguna, Philippines, 4009

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## Abstract

The study determined the level of digital competence and practices, analyze the digital experiences and practices in electronic correspondence or virtual environments per participant, and determined the significant relationship between the level of digital competence and practices on digital citizenship of the Freshmen of Laguna University. Quantitative research design and purposive sampling technique, with a total of 551 freshmen for the Academic Year 2022-2023 taking up Science Technology and Society and Living in the IT Era courses, were utilized. The statistical treatment of data employed was simple percentage, weighted mean, Cronbach's Alpha, and Pearson Product Moment Correlation Analysis. In conclusion: (1) The overall digital competence level of the participants regardless of program is level 2 (Foundational) and the overall digital citizenship practices level of the participants is level 4 (Moderate Extent); (2) Students value most are freedom of speech and expression, responsibility for their actions, and data privacy, but the results showed that subscriptions, copywriting or licensing, reliability, and credibility of the sources need to be addressed. (4) There is a positive linear and significant relationship between digital competence and digital citizenship practices of the participants. The researchers recommend: (1) other researchers to further develop an individual analysis of each individual (case) or per program to determine the individual proficiency and weaknesses to strengthen the digital competencies and practices on digital citizenship using mixed method research design; (2) integrate ICT courses in the curriculum across all programs and sustain the teaching of digital citizenship practices to help students and educators; (3) use the instrument as a program admission and exit requirement ; and (4) Laguna University to create a code of digital ethics on digital citizenship.

**Keywords:** Digital competence, digital practices, digital experiences, digital citizenship

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## 1. Introduction

### 1.1 Rationale

Digital technology has revolutionized the educational system globally. Coping up with the constant changes and improvement of the information and communication technologies and the unlimited upgrading and creation of social media platforms and applications are some of the challenges educational institutions are facing today.

Digital citizenship encompasses responsible and ethical use of digital technologies along with the awareness of digital rights and responsibilities

The COVID-19 pandemic in 2019 impacted the landscape of education globally. Laguna University was not spared from its immense effects. Pure onsite classes in Laguna University was replaced with hybrid classes wherein technology has become essential to the learning process of all students across all levels. Teachers and students rely greatly on technology. Laptops, smartphones and internet connectivity are necessary in order to comply with the requirements and demands of learning through electronic correspondence. Digital technology has greatly influenced the lifestyle and education of the students in

Laguna University. With the information readily available to them on the internet poses a great temptation to cheat and plagiarize in their assignments, projects, and online assessment tasks. With their independence and freedom in virtual education, their ethical values are somehow affected negatively because of the minimal supervision and actual monitoring of students' activities. The teachers have limited opportunities to influence the learners' behavior and moral values. Eventually, education will become more task oriented. For some students, digital skills or technological skills become an advantage, but for others who are not equipped with digital knowledge and skills, online education has become a burden, which may result in poor performance or cheating and plagiarizing. In traditional onsite classes, the students tend to conform to the ethical norms set mostly by teachers on campus, and the pressure to abide by the policies and guidelines is stronger compared to that of purely virtual academic learning, where the students are confined to a virtual campus where they have so much independence and freedom.

This collective case study on the use of correspondence in General education courses (GE 7: Science, Technology, and Society and MST02: Living in the IT Era) entitled "Digital Competence and Practices on Digital Citizenship of the College Freshmen at Laguna University" was conducted in order to deal and respond to this issue objectively and to determine the digital competence, digital skills, and citizenship among the college freshmen in Laguna University. The Laguna University has the following policies and documents: under the Office of the President - Data Privacy Manual-QMS Manual (Level 2, 2021) and the RA 10173 Data Privacy Act (PF LU:PF-ED-08 S. 21-22, Matrix of Quality Standards (2022). Likewise, under the Office of the Academic Affairs are as follows: Data Privacy Consent for Laguna University's Student-applicants and alumni (LU:AA-FO-77, 2021) and Data Privacy Consent Form for University Teaching and Non-Teaching Personnel (LU:AD-FO-76).

Laguna University students are not exempted from the temptation to abuse and misuse their digital citizenship. They may use technology in unethical ways, like finding ways to cheat on an assignment. They may use it in socially detrimental ways, like bullying others on social media. There are expectations of all citizens in a society to behave in certain ways. To report criminal activity, to help others, or to behave appropriately, for example. There are also expectations for everyone who participates, learns, and works in the digital landscape. These expectations form the basis of what it means to be a "digital citizen." Digital citizenship is the appropriate and responsible use of the internet, computers and digital devices. Teaching digital citizenship is more than just having students follow rules, policies, and procedures. Teaching digital citizenship helps ensure that students think critically, behave safely, participate responsibly, and maintain their health and wellness in the digital world.

This study seeks to find out the digital competence and practices on digital citizenship of the Laguna University's freshmen students which would guide in the development of the students' digital skills and citizenship. It's likely that they are competent in using social media, search engines, messaging applications, and productivity tools but their competence may not necessarily translate into effective digital citizenship practices.

### *1.2 Theoretical Implications*

This study may theoretically establish or strengthen existing frameworks on digital competency and digital citizenship locally and internationally. The findings of this study may also provide empirical evidence that the level of digital competence of the students is associated with digital citizenship practices such as responsible and ethical use of digital technologies and improved awareness on their digital rights and responsibilities.

### *1.3 Practical Implications*

The findings of this study may have significant implications for students, teachers, school administrators, parents and other stakeholders in providing a basis for developing or improving curriculum integration, school policies, seminars, and interventions to strengthen digital competencies and their digital

citizenship responsively and ethically.

This study may also provide future researchers with baseline information for further studies on digital competency and digital citizenship.

#### 1.4 Related Studies and Literature

##### **Digital competence**

In higher education, digital competence assessments aim to determine the students' proficiency in areas such as information literacy, digital communication, digital collaboration, digital creativity, and critical thinking. These assessments help educators design appropriate learning experiences and support the development of the students; digital fluency (Basilotta-Gomez-Pablos, et al., 2022).

Assessing digital skills helps identify areas for improvements, tailor support, and enhance students' technological proficiency and ethics which are both important and essential elements of education Mèlich & Boixader (2010). Values help people solve common human issues by defining what is useful, beneficial, and important in life Teja (2011).

Virtual environments have enriched the educational process, supporting higher education students in their learning goals according to Lacka et al. (2021) and providing the educational community with a variety of digital assessment activities according to Bosco (2004); García (2002); Marqués (2002); and Suarez (2002). Foster & Shah, (2021) presented that virtual environments potentially offer immersive and interdisciplinary experiences that aid student's motivation and learning, and impact on students' identity according to Prata et al. (2020) and Umoren & Rybas (2017). Virtual learning environments add value to the design and architecture of dynamic classrooms and allow new pedagogical practices to evolve (Bustos & Coll, 2010; Hilli, 2019). However, few studies analyze the actions of those who intervene (Coll & Monereo, 2008; Nadolny et al., 2013; Cubero-Ibanez et al., 2018). Isidori and Cacchiarelli (2017) argue that technology developments in virtual learning environments raise many ethical issues with no simple solutions. This is how (Levine & Pazdernik, 2018) confirm "The ease of locating information on the Internet makes it more tempting for students to copy and paste information and to submit plagiarized content in assessment tasks and assignments."

##### **Practices on Digital Citizenship**

The era of digital citizenship is a result of the rapid spread in access to the Internet (UAB, 2023). The possibility that the students' ethical values may drift from what is acceptable and ideal. According to Ortiz (2007), in the virtual campus, there is minimal or zero accountability on the part of the students. They are free to do whatever they desire to do. Strong ethical values may influence and spare the students from drifting away from the world of ethics and morals. In a similar study conducted by Zvereva (2023), results show that the traditional moral values are undergoing significant change. Relationships in the digital environment should be based on moral norms, duty, self-discipline, mutual responsibility, and respect. The moral quality in the digital environment using digital technologies are the leading indicators of their professional suitability. According to Piragauta & de Oliveira (2020), the ethical dimension of virtual education should not continue being neglected.

The REPUBLIC ACT 10173: DATA PRIVACY ACT OF 2012 (Philippines) of the National Privacy Commission (<https://privacy.gov.ph/data-privacy-act/>) is an act protecting individual's personal information in information and communications systems in the government and the private sector, creating for this purpose a national privacy commission, and for other purposes that is taught in MST02 Course.

#### 1.5 Hypothesis

There was no significant relationship between the overall digital competence and the overall practices on digital citizenship by the college freshmen of Laguna University.

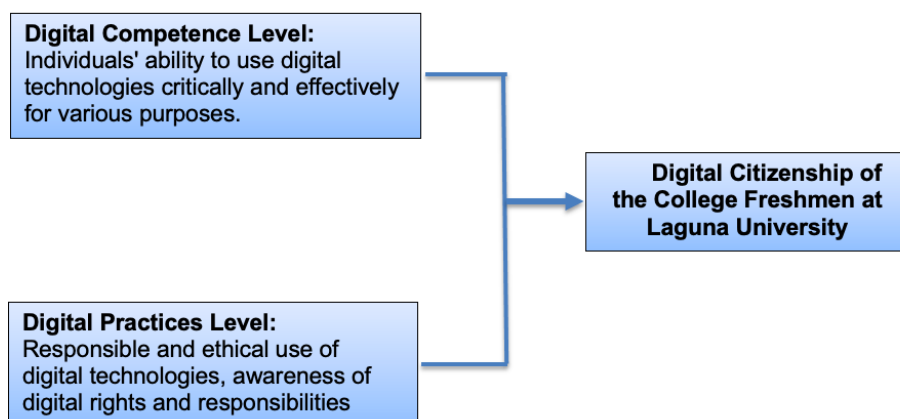
### 1.6 Theoretical Framework

The study is anchored on the Uses and Gratifications Theory, the first major theory used to explain Computer-mediated communication (CMC). It was originally devised in the mid-1970s to explain why people use the types of mass media they do. The basic premise of the theory is that people choose various media because they get something out of that media, or it makes them happy in some way. From this perspective, people choose various media because they have specific goals that they want to fulfill. Zizi Papacharissi and Alan Rubin were the first scholars to apply the uses and gratifications theory to how people use the Internet. They found five basic reasons people were using the Internet: interpersonal utility (allows people to interact with others), pass time (helps people kill time), information seeking (people look for specific information they want or need), convenience (it is faster than face-to-face or even a phone call), and entertainment (people enjoy using the Internet) (socialsci.libretexts.org.n.d.).

An early study published in the journal *CyberPsychology & Behavior* on uses and gratifications of the internet found seven gratifications for its use: information seeking, aesthetic experience, monetary compensation, diversion, personal status, relationship maintenance, and virtual community (Vinney, 2019).

Another theory related to this study is the E-learning theory which is built on cognitive science principles that demonstrate how the use and design of educational technology can enhance effective learning (David, 2015; Wang 2012). This theory was developed from a set of principles created based on Cognitive Load Theory (Sweller, Van Merriënboer & Paas, 2019).

### 1.7 Conceptual Framework



**Figure 1. Conceptual Framework**

### 1.8 Scope and Limitations of the Study

This study focused on the level of digital competence and practices on digital citizenship, analysis of the digital experiences and practices in electronic correspondence or virtual environments per participant, and the significant relationship between the overall level of digital competence and practices on digital citizenship. The respondents were selected first year Laguna University students who were enrolled in Science, Technology, and Society (GE 7) and Living in the IT Era (MST02) in academic year 2022-2023. The survey questionnaire was employed for data collection using the DigComp competence areas namely: information and data literacy, communication and collaboration, digital content creation, safety and problem solving, and on the digital citizenship practices of the participants. Moreover, the ethical values of the students were incorporated in the survey questionnaire made. The results were analyzed and interpreted based on the responses of the respondents to the questionnaire prepared by the researchers.

## 2. Methodology

### 2.1 Research Design

This study used a quantitative research design in order to analyze the data in the form of an online survey using Google Forms. This was employed by using empirical data to address its research question. It measured variables like digital competence, digital practices, and digital citizenship. The first part of the questionnaire focused on the issues of ethical values on digital citizenship. The second part focused on the digital competence of the respondents. The authors and some of the first year students taking up the courses developed the questionnaires and the responses were statistically analyzed.

### 2.2 Respondents of the Study

The respondents of this study were the 551 first year students who were taking up the GE 7 (Science, Technology, and Society) course. Out of the 551 students, only 293 students took MST02 (Living in the IT Era) simultaneously. There were 144 first year students who did not participate in the research survey for several reasons namely, some had officially and unofficially dropped out of the roll and others were not interested to participate.

### 2.3 Research Instrument

The study utilized self-developed digital questionnaires consist of two parts. The first part contains 60 multiple choice questions pertaining to digital competence areas on computer essentials and computer essentials, DigComp competence areas: information and data literacy, communication and collaboration, digital content creation, safety and problem solving. The second part consists of forty items tackling questions on the digital citizenship practices of the participants. Moreover, the ethical values of the students were incorporated in the survey questionnaire made.

Digital competence, practices on digital citizenship, and digital skills assessments in higher education are crucial for equipping students with the necessary competencies to thrive in the digital era. These assessments evaluate students' proficiency, promote responsible digital behavior, and enhance their practical skills in using digital tools and resources. In most IT Certification examinations, the cut scores range from 80% and above. In CCRN, cut scores are around 67-68 % (adult, neonatal, or pediatric).

For an exam to meet rigorous testing industry standards, a passing score (cut score) cannot be arbitrarily selected, wherein, scores must be based on a method that supports the overall testing goals of validity, reliability, and fairness. Ultimately, it must differentiate those who met the standards from those who did not. There are a variety of ways to establish a passing score using standard-setting principles including beta, bookmarking, and Angoff. When setting the initial cut score, applies a modified-Angoff item-centric approach and then monitors exam performance to ensure reliability and validity in the established score (SAFe, 2021).

The Angoff Method is a widely used standard-setting approach in test development, as used in this study. It allows test developers to determine the passing percentage (cutscore) for a test. The Angoff method relies on subject-matter experts (SMEs) who examine the content of each test question (item) and then predict how many minimally-qualified candidates would answer the item correctly. The average of the judges' predictions for a test question becomes its *predicted difficulty*. The sum of the predicted difficulty values for each item averaged across the judges and items on a test is the recommended Angoff cut score (ALTA, 2008).

The research instruments were validated by the authors who are specialized in the subject areas with doctoral training in education and with more than five (5) years of experience as administrators, program chairs, and educators.

#### *2.4 Validity and Reliability of the Instrument*

Both sets of questionnaires were subjected to Cronbach's alpha coefficient that measures the internal consistency and reliability of the survey questionnaires. This also helps determine whether a collection of items consistently measures the same characteristics. Cronbach's alpha quantifies the level of agreement on a standardized 0 to 1 scale. Higher values indicate higher agreement between items. Using the Cronbach's Alpha formula, the reliability of the survey questionnaire: Part 1 has a Cronbach's alpha value of 0.7, and Part 2 has 0.97, which suggests that the items have a high level of internal consistency and is therefore acceptable.

The instruments used in this study are available in the annex. Likert Scale was used ranging from strongly disagree to strongly agree. The instrument is composed of two parts, identifying and measuring the level of competence and the practices.

#### *2.5 Data Gathering Procedure*

Permission to perform this study was granted by the Ethics Committee of the university one month before the survey questionnaires were released. It was indicated that the respondents' responses were taken under the strict principles of confidentiality and data privacy protection. Google forms were used for data collection automation. The authors used the descriptive approach to evaluate trends and experiences in relevant contexts (Garipey, L. W., 2021).

#### *2.6. Statistical Treatment of Data*

For a clearer interpretation of the data gathered from the survey questionnaire, the statistical research methods were used to analyze the data gathered were simple percentage, weighted mean, Cronbach's Alpha, and Pearson Product Moment Correlation Analysis (Pearson R)

#### *2.7 Ethical Considerations*

Participation was purely voluntary. Respondents' identities remained confidential and anonymous. The data collected were used strictly for academic purposes. Informed consent was obtained before participation. Respondents had the right to withdraw from the study at any stage without any form of penalty.

#### *2.8 Experimental manipulations or interventions*

No interventions or experimental manipulations were done in this study.

#### *2.9 Analysis*

The following table of range and scale were used to interpret the data obtained from the respondents' responses.

| Range        | %         | Level | Description           |
|--------------|-----------|-------|-----------------------|
| 58-60        | 97 - 100% | 6     | Highly Advanced       |
| 54-57        | 90 - 95%  | 5     | Advanced              |
| 48-53        | 80 - 89%  | 4     | Intermediate          |
| 40-47        | 66-79%    | 3     | Below Intermediate    |
| 30-39        | 50 - 65%  | 2     | Basic or Foundational |
| 29 and below | Below 50% | 1     | Developing            |

Table 1: The above table presents the range of scores on the digital competence assessments (six levels) of the respondents. In this study, the authors did not set cut-scores, thereby setting the range of scores per level as per the percentages (score over the total no. of items) of Part 1. Column 2 presents the range's percentages, column 3 has the levels and the last column is the interpretation.

| Range |             | Level | Description                        |
|-------|-------------|-------|------------------------------------|
| 5     | 4.51 - 5.0  | 5     | Strongly Agree/High Extent         |
| 4     | 3.41 - 4.50 | 4     | Agree/ Moderate Extent             |
| 3     | 2.61 - 3.40 | 3     | Slightly Disagree/ Fair            |
| 2     | 1.81 - 2.60 | 2     | Disagree/Low Extent                |
| 1     | 1.00 - 1.80 | 1     | Strongly Disagree/ Very Low Extent |

Table 2: In part 2, a five-scale checklist was reflected in the questionnaire with the corresponding range, description and code given in interpreting the computed weighted mean results. Similarly, a five-scale checklist was used in interpreting the computed weighted mean for the respondents' digital citizenship practices level.

### 3. Results and Discussions

This part presents the statistical analysis of data and the corresponding interpretation and discussion of findings based on the statement of the problem of the study.

**Table 3. Participants of the Study**

| Program                                                         | Frequency  | Percentage    |
|-----------------------------------------------------------------|------------|---------------|
| 1. AB Psychology (AB Psy)                                       | 35         | 6             |
| 2. Bachelor of Communication (BAC)                              | 28         | 5             |
| 3. Bachelor of Elementary Education (BEED)                      | 12         | 2             |
| 4. BS Psychology (BS Psy)                                       | 48         | 9             |
| 5. Bachelor of Science in Accountancy (BSA)                     | 50         | 9             |
| 6. Bachelor of Science in Accounting Information System (BSAIS) | 71         | 13            |
| 7. Bachelor of Computer Science (BSCS)                          | 45         | 8             |
| 8. Bachelor in Secondary Education (BSEd)                       | 36         | 7             |
| 9. BS Entrepreneurship (BS Entrep)                              | 63         | 11            |
| 10. BS Information Technology (BSIT)                            | 109        | 20            |
| 11. BS Mechanical Engineering (BSME)                            | 13         | 2             |
| 12. BS Tourism Management (BSTM)                                | 7          | 1             |
| 13. Diploma in Midwifery (DipMid)                               | 34         | 6             |
| <b>Total</b>                                                    | <b>551</b> | <b>100.00</b> |

Table 3 shows the distribution of the participants, total to 551. The participants came from the 13 programs which are all offered by the institution. The BS Information Technology, 109 participants comprised 20%, followed by Bachelor of Science in Accounting Information System (BSAIS) with 71 participants (13%) and the Bachelor of Science in Accountancy (BSA) with 50 participants, comprising 9%. BSIT had the most number of participants in this study.

The institution requires students (and faculty alike) to bring or use their own (personal) devices and network data connection (smartphones, tablets, laptops) to access its portal and various online systems and services (admission and enrollment, and the iLearnU learning management system) linked to it. There is free and public WI-FI in the campus which is provided by the national government.

**Overall Digital Competence Level of the College Freshmen Students at Laguna University**  
**Table 4. Participants Mean Scores Per Program and Overall Digital Competence Level**

|                           | <b>Program</b>                                               | <b>Mean Score</b> | <b>Level</b> | <b>Interpretation</b> |
|---------------------------|--------------------------------------------------------------|-------------------|--------------|-----------------------|
| 1.                        | AB Psychology (AB Psy)                                       | 24                | 1            | Developing            |
| 2.                        | Bachelor of Communication (BAC)                              | 29                | 1            | Developing            |
| 3.                        | Bachelor of Elementary Education (BEED)                      | 30                | 2            | Foundational          |
| 4.                        | BS Psychology (BS Psy)                                       | 33                | 2            | Foundational          |
| 5.                        | Bachelor of Science in Accountancy (BSA)                     | 30                | 2            | Foundational          |
| 6.                        | Bachelor of Science in Accounting Information System (BSAIS) | 33                | 2            | Foundational          |
| 7.                        | Bachelor of Computer Science (BSCS)                          | 26                | 1            | Developing            |
| 8.                        | Bachelor in Secondary Education (BSEd)                       | 27                | 1            | Developing            |
| 9.                        | BS Entrepreneurship (BS Entrep)                              | 34                | 2            | Foundational          |
| 10.                       | BS Information Technology (BSIT)                             | 29                | 1            | Developing            |
| 11.                       | BS Mechanical Engineering (BSME)                             | 24                | 1            | Developing            |
| 12.                       | BS Tourism Management (BSTM)                                 | 21                | 1            | Developing            |
| 13.                       | Diploma in Midwifery (DipMid)                                | 15                | 1            | Developing            |
| <b>Overall Mean Score</b> |                                                              | <b>29</b>         | <b>1</b>     | <b>Developing</b>     |

Table 4 shows the mean scores on the digital competence of college freshmen per program and the overall digital competence mean score of 29, Level 2, interpreted as “Developing.” Among the programs which achieved the highest mean scores were: BS Entrepreneurship with 34, BSAIS and BS Psychology with 33, Bachelor of Elementary Education (BEED) and Bachelor of Science in Accountancy (BSA) with 30, all having Level 2, interpreted as “Foundational.”

Individual top scorer was the participant from the BS Entrepreneurship program and followed by participants from the Bachelor of Science in Accounting Information System (BSAIS). Table 5 shows the individual case scores and the respective levels of each. BSAIS had MST02 (Living in the IT Era) course in

their curriculum.

According to Zhao, et al. (2021), most students do not have the required digital competence level. Technology is still not well blended into either classroom or online learning. Although some studies have shown that students perform positively in some areas of digital competence, there is still a long way to go before they are fully competent. The fact that the students do not have sufficient digital competence is confirmed by all the difficulties and challenges that arose during the lockdowns.

### Overall Level of Digital Citizenship Practices Among the College Freshmen at Laguna University

**Table 5. Participants Level of Digital Practices, Mean Scores and Level Per Program**

| Program                                                         | Mean Score  | Level    | Interpretation         |
|-----------------------------------------------------------------|-------------|----------|------------------------|
| 1. AB Psychology (AB Psy)                                       | 3.41        | 4        | Moderate Extent        |
| 2. Bachelor of Communication (BAC)                              | 3.66        | 4        | Moderate Extent        |
| 3. Bachelor of Elementary Education (BEED)                      | 4.02        | 4        | Moderate Extent        |
| 4. BS Psychology (BS Psy)                                       | 3.95        | 4        | Moderate Extent        |
| 5. Bachelor of Science in Accountancy (BSA)                     | 3.94        | 4        | Moderate Extent        |
| 6. Bachelor of Science in Accounting Information System (BSAIS) | 4.10        | 4        | Moderate Extent        |
| 7. Bachelor of Computer Science (BSCS)                          | 4.10        | 4        | Moderate Extent        |
| 8. Bachelor in Secondary Education (BSEd)                       | 3.96        | 4        | Moderate Extent        |
| 9. BS Entrepreneurship (BS Entrep)                              | 3.68        | 4        | Moderate Extent        |
| 10. BS Information Technology (BSIT)                            | 4.05        | 4        | Moderate Extent        |
| 11. BS Mechanical Engineering (BSME)                            | 3.99        | 4        | Moderate Extent        |
| 12. BS Tourism Management (BSTM)                                | 4.13        | 4        | Moderate Extent        |
| 13. Diploma in Midwifery (DipMid)                               | 2.63        | 3        | Fair                   |
| <b>Total</b>                                                    | <b>3.94</b> | <b>4</b> | <b>Moderate Extent</b> |

Table 5 shows the mean scores on the digital citizenship practices of college freshmen per program and the overall digital practices mean score of 3.93, Level 4, interpreted as “Moderate Extent.”

Among the programs which achieved the highest mean scores were: BS Tourism Management

participants had highest weighted mean scores with 4.13, followed by the BSAIS and BSCS with 4.10, and BSIT with 4.05, all having Level 2. Level 2 is interpreted as “Foundational.” The participants with the lowest weighted mean score were the Diploma in Midwifery (DipMid) program participants with 2.64, interpreted as “Fair.”

Students and teachers may have somewhat different ethical experiences because they view accountability, dedication, and respect as qualities that are inherent to virtual education (Piragauta and de Oliveira, 2023). A good citizen can be equated to a good digital citizen who knows and applies the values/traits/principles: advocates for equal digital rights for all, seeks to understand all perspectives, respects digital privacy, intellectual property, and other rights of people online (UAB, 2023 & Öztürka, 2021).

## Digital Experiences and Practices in Electronic Correspondence or Virtual Environments

**Table 6. Participants Case Scores and Individual Level of Competencies**

[illegible]

Table 6 shows the individual case scores and the respective levels of each. The link: [https://drive.google.com/file/d/1yIcLryOcurxTco1O7bagIeyYSoiPkJwi/view?usp=drive\\_link](https://drive.google.com/file/d/1yIcLryOcurxTco1O7bagIeyYSoiPkJwi/view?usp=drive_link) shows all the case scores, totals 551. There are a total of 270 or 49%, case-participants with Level 1 interpreted as “Developing,” In comparison, 281 or 51% of them belong to Level 2 interpreted as “Basic or Foundational,” regardless of the program.

**Table 7. Participants Case Scores and Individual Level of Practices on Digital Citizenship**

[illegible]

Table 7 shows the individual-participant case scores and the respective levels of each in their practices on digital citizenship. The link is: <https://drive.google.com/file/d/1fAqmbJD5jdURDJ72aevpO5lnk5lERBKH/view?usp=sharing> shows all the case scores, among the 551 participants. There are a total of 229 or 44%, case-participants on Level 5, interpreted as “High Extent,” 141 or 26%, on Level 4, interpreted as “Moderate Extent,” while 143 or 26% of them belong to Level 3, interpreted as “Fair,” 21 or 4% of them belong to Level 2, interpreted as “Low Extent,” and 17 or 3% of them belong to Level 1, interpreted as “Very Low Extent.” The grand overall mean is 3.94 or Level 5, interpreted as “High Extent.”

**Table 8. Mean Scores per Item on the Practices on Digital Citizenship of Participants**

| Item No. | Mean | Item No. | Mean |
|----------|------|----------|------|
| 1        | 3.58 | 21       | 3.82 |
| 2        | 4.07 | 22       | 3.97 |
| 3        | 3.62 | 23       | 4.04 |
| 4        | 3.73 | 24       | 3.85 |
| 5        | 4.09 | 25       | 3.73 |
| 6        | 4.06 | 26       | 4.10 |
| 7        | 4.03 | 27       | 4.01 |
| 8        | 3.79 | 28       | 3.81 |
| 9        | 4.18 | 29       | 3.92 |
| 10       | 4.03 | 30       | 3.97 |
| 11       | 3.85 | 31       | 3.98 |
| 12       | 3.53 | 32       | 3.77 |
| 13       | 3.95 | 33       | 3.68 |
| 14       | 4.24 | 34       | 3.80 |
| 15       | 4.20 | 35       | 3.88 |
| 16       | 4.14 | 36       | 3.92 |
| 17       | 4.09 | 37       | 3.98 |
| 18       | 3.95 | 38       | 4.00 |
| 19       | 4.03 | 39       | 3.99 |
| 20       | 4.06 | 40       | 3.98 |

Table 8 shows the items mean scores per item of the practices on digital citizenship of participants. The following items have the lowest mean scores: “12. Accessing and long time usage of cracked apps instead of paying for subscriptions is not my thing,” “1. I do not readily believe the news that I’ve read online,” “3. I can identify in a list of job portals and apps a friend has found in an employment office’s blog, those that are commonly used because they have credible and reliable job offers., “33. I can fix problems such as identifying the symbol that indicates that an image is copyrighted and therefore cannot be used without the author’s permission.” and “4. I can identify, from a list in my textbook of blogs and digital databases containing available literature, those that are commonly used because they are credible and reliable.” with a weighted overall mean of 3.53, 3.58, 3.62, 3.73, and 3.79 respectively, were the question items with the lowest value among questions. Those items pertained to digital citizenship topics such as: subscriptions, job portals and apps, copywriting or licensing, reliability, and credibility of the sources.

The items with the highest means were: “14. I always respect other people’s freedom of speech and expression.”, “ I take full responsibility for my actions in using gadgets, whether posting or commenting.”, and “9. Individuals should have the right to know what data is being collected about them and how it is being used by companies and organizations,” with the following mean scores, 4.24, 4.20, and

4.18, respectively. This is attributed to respect on people's freedom of speech and expression, responsibility on posts and use of gadgets, and the individual's right to data privacy.

The items with the highest mean scores can be attributed to the respondents' knowledge and practices on the value of respect for people's freedom of speech and expression, responsibility for posts and use of gadgets, and the individual's right to data privacy. The items with the lowest mean scores pertain to digital citizenship topics such as: subscriptions, copywriting or licensing, reliability, and credibility of the sources. Digital media plays a significant role in students' lives. The availability of ICT infrastructure and appropriate devices in schools is one of the issues. Without application, students may be able to identify and access digital spaces but lack the ability to make digital tools work for them in the pursuit of real-world change. Teachers can cultivate a mindset among the students that encourages positive activism and positive role students can play as changemakers both in digital spaces and offline.

Nowadays, a good citizen can also be equated to a good digital citizen: he/she knows and applies the following values/traits/principles: advocates for equal digital rights for all, seeks to understand all perspectives, respects digital privacy, intellectual property, and other rights of people online, communicates and acts with empathy for others' humanity via digital channels, applies critical thinking to all online sources, including fake news or advertisements, leverages technology to advocate for and advance social causes, is mindful of physical, emotional, and mental health while using digital tools, leverages digital tools to collaborate with others, understands the permanence of the digital world and proactively manages digital identity (UAB, 2023 & Öztürka, 2021).

Digital ethics, the norm dedicated to ensuring the autonomy and dignity of users, is respected on the internet. While traditional ethics concern relationships between individuals, and corporate ethics pertain to relationships between companies and customers, digital ethics blend these to apply to any two (or more) parties interacting online.

Personal digital ethics encompass how individual users honor one another's right to self-determination online. What makes these unique compared to the typical ethics guiding interpersonal conduct is that, given the nature of online infrastructure, communications is almost always mediated by some private interest or third-party. In this way, digital ethics prescribe how two individuals communicating online should behave, how two corporations should responsibly conduct internet commerce, and how companies should treat their users.

**Table 9. Frequency and Percentage**

| Items/Questions                                                                                                                                                                         | Frequency<br>(f) | Percentage |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|------------|
| 4.9 Public Domain images have no copyright because:<br>The copyright holder released the work into the public domain.                                                                   | 133              | 24%        |
| 5.1 Which of the following are signs of phishing/ scam?<br>A code was sent via an SMS and redirects you to a website                                                                    | 106              | 19%        |
| 5.5 Which of the following describes the principle of accountability: Personal data shall be kept no longer than is needed for the purposes of processing.                              | 70               | 13%        |
| 5.6 Which of the following constitutes a breach of personal data? A failure in security that results in the accidental disclosure of corporate financial data.                          | 75               | 14%        |
| 5.7 Which of the following is a form of cyberbullying? Posting comments or rumors about someone online that are mean, hurtful, or embarrassing.                                         | 362              | 66%        |
| 6.1 Ecommerce is maintaining relationships and conducting business transactions that include selling information, services, and goods by means of computer telecommunications networks. | 510              | 93%        |

Table 9 shows the respondents' understanding of the digital ethics (by frequency and percentage) of who got it correctly about the items above. It shows that ecommerce got the highest frequency of 510 and as a result, also got the highest percentage of 93%. It means that majority of the respondents are involved in ecommerce especially during the time of COVID-19 that taught people how to be creative in business like online selling to survive the pandemic and continue to do it until the present time. The principle of accountability got the lowest frequency of 70 or 13% only.

**Table 10. Digital Ethics Practices**

| Items/Questions                                                                                                                                                                                                                  | Weighted Mean |                 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-----------------|
| 22. In joining a video meeting, I usually use my first name and surname.                                                                                                                                                         | 3.97          | Moderate Extent |
| 23. I ask permission first in adding a friend or a colleague in a group chat or any social media group.                                                                                                                          | 4.04          | Moderate Extent |
| 25. When I am forwarding an email message, I use BCC (blind carbon copy) rather than CC (carbon copy) when sending it to more than one person, to protect the privacy of all the other email recipients.                         | 3.73          | Moderate Extent |
| 28. I promptly reply to e-mails or messages. If cannot do so, I have the courtesy to reply to a message within a few days, especially if that message is from family or friends.                                                 | 3.81          | Moderate Extent |
| 34. I can also help my friends/classmates to detect risks and threat while using the digital learning platform on their tablets (e.g. controlling who can access the files).                                                     | 3.80          | Moderate Extent |
| 36. I can activate two-factor authentication when available.                                                                                                                                                                     | 3.92          | Moderate Extent |
| 37. I can distinguish between appropriate and inappropriate digital content to share it on my school's digital platform, social media and other platforms, so that my privacy and that of my friends/classmates are not damaged. | 3.98          | Moderate Extent |
| 38. I know how to create a profile in digital environments for personal or professional purposes.                                                                                                                                | 4.00          | Moderate Extent |

Tables 10 shows the digital ethics practices by the respondents, to be on moderate extent. The highest mean was 4.04 about asking permission in adding someone in a group chat. It was closely followed by 4.00 about creating a profile in digital environments for personal or professional purposes. The lowest was 3.73 about the use of BCC and CC when sending to more than one person to protect privacy of the recipients.

### Relationship Between the Overall Digital Competence Level and the Overall Level of Practices on Digital Citizenship

**Table 11. Relationship of the Digital Competence of College Freshmen Per Program and the Digital Practices**

| Variables                                                        | R              | p value            | Interpretation                                                      |
|------------------------------------------------------------------|----------------|--------------------|---------------------------------------------------------------------|
| Digital Competence of College Freshmen and the Digital Practices | <b>0.20696</b> | <b>6.8674E-270</b> | <b>Highly Significant</b><br><br><i>*Reject the Null Hypothesis</i> |

There is a positive linear significant relationship (0.20696) between the variables and a p-value of 6.8674E-270 (on a two-tailed test), which is lower than the significant alpha of .05, thereby rejecting the null hypothesis as shown in Table 11. This can be attributed to the knowledge, skills, and attitudes that the participants possess.

The findings of this study are similar to Arkorful, Salifu, Arthur, & Nortey, 2024, that problem-solving, communication and collaboration, and digital content creation competencies had a significant positive influence on higher education students' digital citizenship.

## 4. Conclusions and Recommendations

### 4.1 Conclusions

1. The overall digital competence level of the college freshmen students at Laguna University is level 2, or "developing." The overall level of practices on digital citizenship of the college freshmen at Laguna University is level 4, or "moderate extent."
2. The students value most the following: freedom of speech and expression, responsibility for their actions, and data privacy. On the other hand, they need more information on subscriptions, copywriting or licensing, reliability, and credibility of the sources.
3. There is a positive linear and significant relationship between the level of overall digital competence and the overall level of practices on digital citizenship by the college freshmen.

### 4.2 Recommendations

1. Other researchers can further develop an individual analysis of each individual (case) or per program to determine the individual proficiency and weaknesses to strengthen the digital competencies and practices on digital citizenship using mixed method research design.
2. A successful implementation of ICT requires integration of ICT courses in the curriculum across all programs in the institution, and similar higher education institutions. The "ongoing" technical, human, and organizational support on all of these issues are needed to ensure access and effective use of ICT. Revisiting its program intended learning outcomes and inclusion of the ICT skills will be necessary.
3. The possible ways to overcome any identified issues with ethical values in digital citizenship are outlined in the recommendations that follow. Nonetheless, the following are important to address the gaps or issues: integration of digital citizenship in the curriculum across all programs; research and publication; institutional and mandatory seminars/workshops/training to be led by the Center for Lifelong Learning (CILL) and the Office of Student Affairs and Services (OSAS); intervention programs, policies, partnerships, and donors; infrastructure and further research; AI-based technologies and community-based initiatives; and participation of global participants.
4. The feasibility of creating a code of digital ethics on digital citizenship which can be developed by the stakeholders and LU executives as policy..
5. The instrument used in this study can be used as pre-assessment and post-assessment tools to determine the students' level of digital competences and digital citizenship practices, assessed on the current semester, and as a program admission and exit requirement. Further enhancements can be done, such as additional questions and item analysis for MST02 or any ICT course (with lecture and laboratory support) that will be created or offered. There is still a room for improvement since this is the first year of the participants, and they have enough years or months to improve on their digital competences and digital citizenship which may be valuable in their future role, work and as lifelong learners.

6. Teaching digital citizenship is more than just having students follow rules, policies and procedures. Teaching digital citizenship will help to ensure that students think critically, behave safely, participate responsibly, and maintain their health and wellness in the digital world.
7. The development of teachers' and employees alike - digital competencies is also vital in ensuring effective integration of technology in higher education. Continuous training, collaboration, and informed definitions are essential for fostering digital fluency and responsible digital citizenship among students and educators alike. Teacher policies need to target basic ICT literacy skills, ICT use in pedagogical settings, and discipline-specific uses.
8. Teaching and internalization of the REPUBLIC ACT 10173: DATA PRIVACY ACT OF 2012 (Philippines) of the National Privacy Commission (<https://privacy.gov.ph/data-privacy-act/>) that is taught MST02 course, could also be part of other Digital Citizenship course or topic. Discussion of the LU policies related to the implementation of the act should be encouraged.
9. School policies, plans and programs need to provide the schools with the minimum acceptable infrastructure for ICT, including stable and affordable internet connectivity and security measures such as filters and site blockers.
10. The development of AI-based systems or technologies, websites, tutorials, infographics and social media campaign materials, can be encouraged among the MIS Team, stakeholders and researchers. Furthermore, an AI-based system can be developed for a detailed individual analysis of each participant's results and can be graphically produced in electronic, printed or web-based format.

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"The authors declare no conflict of interest."

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