Examining Digital Literacy towards ICT Among Students Based on Demographic Profile: A Descriptive Analysis Approach

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Abstract
In today's rapidly changing, technology-driven world, digital literacy has become increasingly important. As the use of technology continues to grow, it is vital that students possess the necessary skills to effectively navigate and utilize digital tools. Formal education students guided and assessed by instructors help develops a nation. Digital literacy requires creativity, security, and social awareness. This research's biggest problem is classifying students' digital literacy to meet the increased need for digitally proficient employment. To give students the skills they need to succeed in today's digital environment, it's important to know how to classify students by digital literacy. Thus, the goal of this study is to analyse digital literacy, determine skill and attitude levels, and examine the relationship between skill and attitude among UiTM students. The study sampled 364 students. Voluntary sampling to manage sample composition. Two types of analyses been conducted to achieved research objectives. Descriptive Analysis comes prior to Spearman Rank Correlation. The study assessed students' digital literacy by examining their computer and internet skills and attitude towards technology. 50% of respondents had "Sometimes" to "Every time" application skills. The study also found a weak positive correlation (0.300) between computer and internet skills and technology attitude, indicating room for improvement in encouraging students to use technology. The correlation was significant at 0.01 (p=0.000). University students, mostly women, were surveyed on their digital skills and technology use. Most participants used computers daily and were competent. Students liked technology and preferred using their computers at home. The study indicated a weak positive correlation between digital skills and attitude, suggesting space for improvement in encouraging technology use.
Keywords: Digital Literacy, ICT, Demographic Profile, Descriptive Analysis, Higher Education

Introduction
In today's rapidly changing, technology-driven world, digital literacy has become increasingly important. As the use of technology continues to grow, it is vital that students possess the necessary skills to effectively navigate and utilize digital tools. Students, who are engaged in

formal education guided and assessed by instructors, play a crucial role in the development of a country. The ability to use technology effectively is essential not only for academic success but also for future career prospects.

Information gathering and extraction is under progress in the digital world. In this case, the students are using digital resources to learn. Learning is the act of acquiring knowledge through observation, interaction, and the application of acquired skills. Since the global pandemic of COVID-19, learning from online sources has surpassed all others as the preferred mode of study. Students, like everyone else, must quickly adjust to this new online system since they have no other options. The ability to use current technology is a necessary skill in practically any profession nowadays. With the worldwide landscape of online education, the necessity for digital literacy has risen to the forefront. When starting a digital project, this is the first thing to do.

The term "digital literacy" may be defined in a variety of ways, but in general, it refers to the capability of making efficient use of digital tools and technology in order to gain access to, analyse, evaluate, and transmit information. The ability to exploit digital resources creatively, the knowledge of how to assure security in digital environments, and the ability to include an understanding of social society are all necessary components of digital literacy (Nathanael, 2022). One example of a Malaysian university that has embraced digital literacy is Universiti Teknologi MARA (UiTM), which has offered various programs to over 165,000 students enrolled across its campuses throughout the country. With the sudden shift to Open Distance Learning (ODL) during the Covid-19 pandemic, both lecturers and students at UiTM have been exposed to the use of digital tools and technologies, which may enhance their digital literacy skills.

The capacity to use digital tools for communication, collaboration, research, analysis, and creation are all examples of the vast variety of skills that are encompassed by the term "digital literacy." By having students take a test to determine their level of digital literacy, we are able to pinpoint areas in which they may have deficiencies and build specific interventions to help them strengthen their abilities.

Students need to be prepared with the required skills and competencies to navigate and prosper in a world that is becoming increasingly digital. One way to ensure that students have these skills and competencies is to ensure that they understand the features of digital literacy among students and build a categorization system for it. It is possible that some individuals will wonder about the level of preparedness possessed by the students. Alternately, does the student have sufficient levels of digital literacy in terms of their computer skills and ability to use the internet? How do attitudes about digital literacy influence academic performance?

A previous study by Jeon & Kim (2022) showed a correlation between self-efficacy and digital literacy and concluded that both need to be addressed in order to improve eHealth literacy. Wardana et al (2023) conducts research on the relationship between digital literacy and the viability of businesses in the creative economy. According to the findings, digital literacy is a factor that can explain the creative economy, the sustainability of businesses, and an entrepreneurial attitude. On the other hand, the factors that influence entrepreneurial attitudes, such as digital literacy and the viability of businesses, require help whereas (Top et al., 2023) investigates the link between digital literacy and the mindset of parents and discovers a good correlation between the two.

The most important challenge that this research faces is determining how to best characterise students' levels of digital literacy so that they can meet the growing need for digitally skilled workers. It is essential to have a clear understanding of how students can be categorised in

terms of their level of digital literacy in order to ensure that students are provided with the competencies required to thrive in the digital world of today. As a result, the objective of this research is to analyse the characteristics of digital literacy, to identify the level of digital literacy according to skill and attitude and to examine the relationship between skill and attitude of students towards digital literacy among UiTM students.

Literature Review

Digital technology has altered the way we interact, learn, and communicate with one another. In today's digital era, the ability to effectively access, comprehend, and utilise technology is becoming increasingly crucial. Digital literacy refers to the skills, knowledge, and behaviours necessary for navigating, evaluating, and creating digital content using a variety of digital technologies.

This literature review aims to investigate the current condition of digital literacy research. Specifically, we will investigate the various conceptualizations of digital literacy, its significance in education, and the various formal and informal approaches to teaching digital literacy. The challenges associated with digital literacy, including the digital divide, digital inequalities, and the potential negative impacts of technology on individuals and society, will also be examined.

This review seeks to provide a comprehensive understanding of digital literacy and its implications for education and society by synthesising the existing literature. This review's findings may inform the development of policies, programmes, and pedagogical approaches aimed at promoting digital citizenship and enhancing digital literacy skills. This review will ultimately contribute to the ongoing conversation about digital literacy and its role in influencing our digital future.

Digital Literacy

The data presented in Yustika and Iswati's (2020); Lilian (2022) studies provide evidence in support of the claim that digital literacy is necessary for academic achievement. On the other hand, they warn that students who are not proficient in digital abilities may experience anxiety or discomfort when attending online classes. This demonstrates how important it is to provide pupils with comprehensive instruction in information literacy abilities. In a similar vein, Yanzi et al (2019) propose that digital literacy is essential for developing global citizens who are able to make efficient use of digital media such as robotics, big data, and the Internet of things. Therefore, both findings stress the need of education sectors developing and providing proper training in digital literacy. This is necessary to ensure that students may flourish academically and become citizens who are competent on a global scale.

Digital literacy improves students' self-control and online risk. Parental mediation can explain internet hazards but not self-control. Self-control reduces internet risk in children. Finally, digital literacy affects online risk in children. Low self-control made some youngsters high-risk online. This is crucial since children can now access the internet anywhere. If left unchecked, youngsters will become internet-dependent and vulnerable to cyber-kidnapping and cyberbullying (Purnama et al., 2021).

Studies have shown that a higher level of digital literacy positively impacts academic performance, while a lack of digital skills can cause anxiety and discomfort in online classes. Formal and operational internet skills are necessary but not sufficient conditions for the development of information and strategic skills in the digital world. Therefore, education sectors must prioritize the systematic training of information skills to prepare students for

success in academia and to become competent global citizens who can effectively use digital media. Overall, digital literacy is a crucial skill that individuals must possess to thrive in the modern world.

Computer Skill and Attitude

The outstanding developments in technology have created an impact on how people interact with one another, how they work, and how they learn. Learning throughout one's entire life may benefit by participating in virtual learning activities, often known as digital literacy. Since the lightning-fast rate at which skills required in the workplace are undergoing change, it is impossible for any educational institution to keep up with the ongoing need to adjust the ways in which we work and live. The most important thing is for young people to learn new skills since the significant changes in our society necessitate it. The long-term goal is that Malaysia has demands for growth that is both sustainable and productivity-driven, both of which can only be achieved with people who are proficient in digital literacy. Even though the education system in Malaysia has made some first steps in this direction, not much study has been done on the factors that contribute to digital literacy (Khan et al., 2022)

Based on Aydin (2020), both education and the labour market have long placed a premium on computer proficiency. The digital divide still exists for individuals with distinct socio-demographic characteristics, despite the fact that these skills are developed to a certain extent through school curricula. With its expanding scope, the concept of digital divide, which is used to describe individuals who do not have equal access to digital technologies, has begun to be viewed as a determining factor for digital competencies.

The ability to engage as a citizen on an equal footing in a modern democracy strongly depends on one's level of digital literacy, which is becoming an increasingly necessary skill in modern society. As a consequence of this, it is now reinforced as an essential learning objective on a global scale as well as on a national scale. When we use the internet, we leave traces that can be collected, processed, exploited, and shared by businesses, organizations, and individuals (Samuelsson & Lindstrom, 2022). This is one of the common effects of the digitization of society, which also facilitates intrusive online monitoring.

Learning in today's digital age is a pervasive concept that extends to all elements of a person's life, including their profession and their leisure activities. An ever-increasing number of students are receiving knowledge on the Internet by connecting to the Internet. This is a direct outcome of the creation of new teaching and learning tools that have become available. Therefore, it is essential for all citizens to acquire digital literacy as a skill that may be used throughout their lives. Studies have been carried out on the students at higher education institutions to investigate their digital skill sets (Urakova et al., 2023).

Computer skills and digital literacy attitude determine an individual's capacity to use digital media and technology. Years of internet usage and total hours spent online have a minimal link with digital abilities, suggesting that spending time online may not enhance digital literacy. However, a good attitude and a willingness to learn and improve can considerably boost digital literacy. Independent students generally score higher on digital literacy tests, demonstrating the value of self-motivation and initiative in digital skill development. Today's digital world requires computer skills and a good approach towards digital literacy.

Methodology

Population and Sample of the Study

The target population of this study was all students who were currently enrolled in UiTM (Universiti Teknologi MARA). 364 students who responded to the study been selected as a sample. The process of selecting a sample using voluntary sampling due to controlling sample composition.

Research Instrument

This study will employ a quantitative research approach. A pilot study was carried out to ensure the pretest process for questionnaire evaluation and to make sure the respondents were devoid of any semantic problems. Apart from this, ambiguity, and impreciseness, such as clarification of questions, length of instruments, completeness of content and structure, were addressed based on feedback received. Once the questionnaire passed the evaluation process, the actual study been conducted.

The questionnaire had been adapted by (Eryansyah et al., 2019) and was distributed to UiTM students via social networks such as Facebook, WhatsApp, and Telegram. Once the data been gathered, the process of analysis been conducted using IBM SPSS 28. Descriptive statistics were used to obtain the frequency, percentage, mean scores and standard deviation based on the data gathered. The researcher used a five-point Likert scale for both domains. The scales for the first domain, the skills in using computer and internet are 1 = Never, 2 = Almost never, 3 = Sometimes, 4 = Almost everytime, and 5 = Everytime. Meanwhile for the second domain, Attitude towards ICT use is 1 = Strongly disagree, 2 = Disagree, 3 = Neither disagree nor agree. 4 = Agree, while 5 = Strongly agree.

Ahmad (2002) score interpretation was used to determine the level of digital literacy, where a mean score between 1.00 and 2.33 indicated a low level of literacy, a score between 2.34 and 3.66 showed moderate, and a score between 3.67 and 5.00 indicated a high level of digital literacy. Table 1 demonstrates the score interpretation utilised.

Table 1
Mean score interpretation

Mean Score	Interpretation
1.00 - 2.33	Low
2.34 - 3.67	Intermediate
3.68 - 5.00	High

(Source: Ahmad, 2002)

Data Analysis

i. Descriptive Analysis

Two types of analyses have been conducted in order to achieve research objectives. The first analysis is using descriptive analysis. Descriptive analysis was used to analyse the digital literacy among students. Descriptive analysis was used to analyse the basic features of the data obtained in the survey using summary and statistical tables. The investigation is conducted to examine respondents in the demographic field, such as gender, programme, usage of computer, level proficiency of digital/computer literacy, and place of access to

computers. In this stage, the median and interquartile range were used to analyse the skills using computers and the internet. Median is the value in the middle of the data set, meaning that 50% of data points have a smaller value or equal to the median and other 50% of data points have a higher value or equal to the median. Interquartile range is the range of values that reside in the middle of the score.

ii. Correlation (Spearman Rank Correlation)

Spearman correlation was used to measure the strength and direction of association between two variables. Based on the objective, two variables namely skills and attitudes have been analysed in the relationship towards digital literacy among UiTM students. To investigate the relationship between skills and attitudes, the value of the correlation coefficient varies between +1 to -1. A value of ± 1 indicates a perfect level of relationship between two variables. As the value of the correlation coefficient approaches 0, the relationship between the two variables will be weaker. The direction of the relationship is indicated by the sign of the coefficient; a + sign indicates a positive relationship and a − sign indicates a negative relationship. Table 2 below shows the strength of correlation.

Table 2
The strength of the Spearman rank correlation

Correlation value	Strength
0.00 to 0.20	Negligible
0.21 to 0.40	Weak
0.41 to 0.60	Moderate
0.61 to 0.80	Strong
0.81 to 1.00	Very strong

(Doolen, 2014)

Results and Discussion

Table 3 shows the characteristics of digital literacy among students in UiTM. Majority of the students involved in this study were female with 234 (64.3%). Meanwhile, the balance of them were male with 130 (35.7%). There are eight programmes involved in this study. Most of them came from programme Diploma in Computer Science with 88 (24.2%) followed by Diploma in Mathematical Sciences 81 (22.3%). Students from Diploma in Statistics involve 60 (16.5%). Next, the students came from Bachelor of Computer Science with 52 (14.3%). Diploma of Science only participate with 44 (12.1%). Diploma in Accountancy and Diploma in Accounting Information System involve an equal amount which is 18 (4.9%). The lowest involvement came from Diploma in Actuarial Science with 3 (0.8%). In terms of computer usage, the majority of them use the computer daily with 262 (72%). Then, their level of proficiency was on average 286 (78.6%). They love accessing their computer at home with 273 (75%).

Table 3

Characteristics of digital literacy among students

Respondent profile		Frequency	Percentage (%)
Gender	Male	130	35.7
	Female	234	64.3
Programme	Diploma in Computer Science	88	24.2
	Diploma in Statistics	60	16.5
	Diploma in Actuarial Science	3	0.8
	Diploma in Mathematical Sciences	81	22.3
	Diploma in Accountancy	18	4.9
	Diploma in Accounting Information System	18	4.9
	Diploma of Science	44	12.1
	Bachelor of Computer Science	52	14.3
Usage of computer	Daily	262	72
	Weekly	86	23.6
	Monthly	16	4.4
Level proficiency of digital/computer literacy	Beginners	57	15.7
	Average	286	78.6
	Expert	21	5.8
Place of access computer	Home	273	75.0
	Institution	58	15.9
	Library	5	1.4
	Net Centres	5	1.4
	Others	23	6.3

The digital literacy of students was determined by investigating two domains, which are the skills in using computers and the internet and the attitude towards ICT use. Table 4 presents the information for the first domain, which is the skills on using computer and internet applications that contains 11 items. The median and interquartile range are calculated and discussed for each domain. The analysis shown that 50% of the respondents have the skills in using computer and internet from Sometimes to Every time (Median=3) when they are using Word processing applications (IQR=3 to 4), Spreadsheet applications (IQR=3 to 3), Presentation applications (IQR=3 to 4), Communication applications (IQR=3 to 4), Learning management systems (IQR=3 to 5), Social networking services (IQR=5 to 5), Blogs (IQR= 1 to 3), Podcasts (IQR= 1 to 3), File sharing sites (IQR= 2 to 3), Web searching engines (IQR= 5 to 5) and Dictionary apps (IQR=3 to 4). Another 50% are from never to almost never.

Table 4
Median and Interquartile range for skills in using computer and internet.

Skills in using computer and internet	Median	Interquartile Range
Word processing applications	4.00	1
Spreadsheet applications	3.00	0
Presentation applications	3.00	1
Communication applications	3.00	2
Learning management systems (LMS)	4.00	2
Social networking services	5.00	0
Blogs	2.00	2
Podcasts	2.00	2
File sharing site	3.00	1
Web searching engines	5.00	0
Dictionary apps	3.00	1

Table 5 displays the data for the second domain, which consists of ten items and is titled "attitude towards ICT use". According to this table, two items have a mean score that is moderate which are I feel threatened when other people discuss about ICT (M=2.85, S=1.103) and I feel that I am behind my fellow students in using digital technologies (M=3.23, S=0.999). There rest of the items shows high mean scores which are I enjoy using digital devices (M=4.48, S= 0.587), I feel comfortable using digital devices (M=4.40, S=0654), I am aware of various types of digital devices (M=4.28, S= 0.703), I understand what digital literacy is (M=3.75, S= 0.843), I am willing to learn more about digital technologies (M=4.36, S=0.672), I think that improving my own digital literacy is important (M=4.38, S=0.617) and I think that training in technology-enhanced language learning should be included in language education programs (M=4.24, S=0.707). The overall mean score attained was 4.02, indicating a high mean score that reflects a positive attitude towards the use of ICT among respondents.

Table 5
Mean and Standard value for attitude toward ICT use

Attitude toward ICT use	Mean	Std. Deviation	Interpretation
I enjoy using digital devices	4.48	0.587	High
I feel comfortable using digital devices	4.40	0.654	High
I am aware of various types of digital devices	4.28	0.703	High
I understand what digital literacy is	3.75	0.843	High
I am willing to learn more about digital technologies	4.36	0.672	High
I feel threatened when other people discuss about ICT	2.85	1.103	Moderate
I feel that I am behind my fellow students in using digital technologies	3.23	0.999	Moderate
I think that improving my own digital literacy is important	4.22	0.698	High

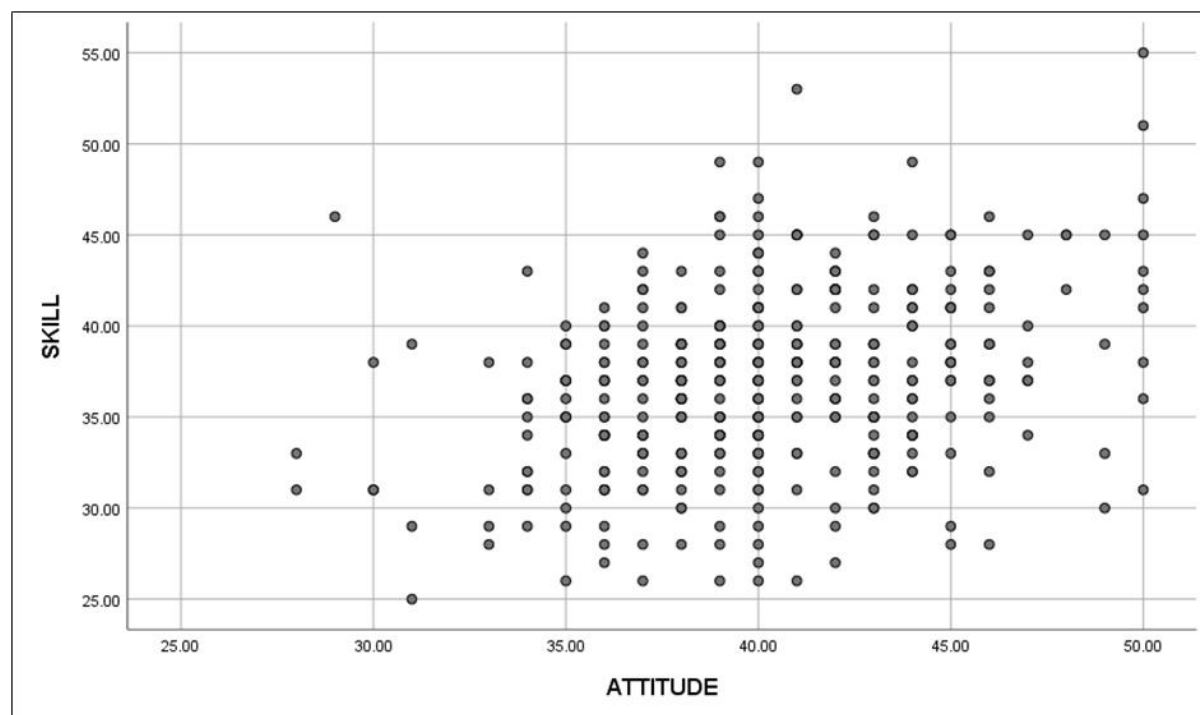|			
I believe that the use of digital technologies can improve my learning	4.38	0.617	High
I think that training in technology-enhanced language learning should be included in language education programs	4.24	0.707	High
Average	**4.02**		**High**

Figure 1: Scatter diagram on Attitude vs Skill

Scatter plot was used to investigate the existence of relationship between two variables. Based on Figure 1 above, it is shows that there is an existence of a positive relationship between skills and attitude towards using computer and internet. Thus, further analysis should be conducted to investigate the strength of the relationship between these two domains.

Table 6

Correlation between Skill and Attitude

			SKILL	ATTITUDE
Spearman's rank	SKILL	Correlation Coefficient	1.000	0.300**
		Sig. (2-tailed)	.	0.000
		N	364	364
	ATTITUDE	Correlation Coefficient	0.300**	1.000
		Sig. (2-tailed)	0.000	.
	N	N	364	364
	**. Correlation is significant at the 0.01 level (2-tailed).			

Table 6 above illustrated Spearman's Correlation coefficient significant value between skills in using computer and internet and attitude toward ICT use. It can be concluded that there was a weak positive relationship between skills in using computer and internet and attitude toward ICT use of (0.300) and significant at the 0.01 level (p=0.000).

Conclusion

As technology keeps getting better and more important in our daily lives, digital literacy is becoming more and more important in our modern society. A good understanding of digital literacy can help people find and use digital tools, talk and work together online, review information they find on the internet critically, and keep themselves safe from possible digital threats. Therefore, this study aimed to analyse the characteristics of digital literacy among UiTM students to identify the degree of their digital literacy and next examine the link between skill and attitude of UiTM students towards digital literacy. By testing university students' digital literacy, teachers and organisations can find out where they are strong and where they need to improve. They can then come up with methods and programmes to help students learn the skills they need to succeed in a digital world.

The results of this study shed light on the digital literacy levels and attitudes towards ICT use among university students. A majority of the respondents were found to be female, constituting a staggering 64.3%. Furthermore, it was found that computer usage among the participants was quite high, with a majority of them using the computer daily. Their levels of proficiency were also found to be decent, with most respondents scoring an average proficiency level. Interestingly, the students displayed a strong affinity towards accessing their computers at home, with a whopping 75% of respondents preferring to do so. When it came to their overall attitude towards the use of ICT, the respondents demonstrated a highly positive outlook, with the overall mean score being an impressive 4.02.

However, the study also revealed a weak positive relationship between computer and internet skills and attitude towards ICT use. This finding suggests that while students may possess a decent level of digital literacy, there is still room for improvement in fostering a

more positive attitude towards the use of ICT. Even though these findings provide valuable insights into the digital literacy levels and attitudes towards ICT use among university students it is not without limitations. Students may also face challenges in applying their digital literacy skills to real-world situations. While they may be proficient in using digital tools and platforms in academic settings, they may lack the experience and confidence to use them in professional or personal contexts. This calls for the development of more practical and experiential learning opportunities to help students to bridge the gap between their digital literacy skills and their ability to apply them in real-world scenarios. Addressing these limitations requires a comprehensive approach that focuses on access, adaptability, and practical application of digital literacy skills.

This study contributes to a better understanding of UiTM students' digital literacy levels, attitudes, and issues. It gives useful insights that may be used to guide the design and execution of educational programs and interventions aimed at improving digital literacy abilities and instilling a good attitude towards ICT use in university students. Ultimately, this study serves as a valuable resource in advancing digital literacy and preparing UiTM students for success in an increasingly technology-driven society.

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