# Digital Skill Related Problems among Digital Natives in a Malaysian Public University

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## ABSTRACT

Nowadays, university students are often considered digital natives, but many still encounter digital skill-related problems, particularly in technical use, information management, and learning strategies. These challenges may affect their academic performance and engagement in technology-based learning. Addressing this issue is crucial for universities to design affective interventions and training programs that enhance student' digital competencies. Hence, this paper examines the digital skills related problems experienced by digital native generation when using information and communication technology (ICT) and to identify the difference between students with and without digital skill-related problems in terms of their digital skills. This study investigates the digital skills related problems experienced by digital natives in a Malaysian public university. Using a cross- sectional survey of 351 students aged 18–26 years, the study examined four categories of digital skills: operational, formal, informational, and strategic. Results revealed that formal skill- related problems were most common (58.4%), followed by informational (44.2%), operational (39.9%), and strategic (35.9%) skill-related problems. Specific difficulties included transferring files between devices, uploading and downloading data, synthesizing online information, and creating or editing text files. The findings highlight that despite being digital natives, students continue to face challenges in essential and advanced digital skills, underscoring the need for targeted digital literacy training in higher education.

**Keywords:** digital skills, operational skills, informational skills, digital native generation.

## INTRODUCTION

The rapid advancement of digital technologies into our daily lives required situations that needed well-versed digital skills among the people. The well-versed digital skills are most needed specifically among digital natives because they are the legacy generation in the future. Prensky (2001) who first proposed the concept of 'digital natives' as a generation of people born in or after 1980. Common characteristics of digital natives as described by Prensky (2001) are people who lived their lives in with digital technologies, have a culture of connectivity and online creating and sharing, have e-lives that revolve around the internet by accessing information and interact with others like blogging, playing online games, downloading music, purchasing and selling online, and socializing via social media networks, like to receive information quickly, and they are multi-taskers, parallel processers, and prefer graphics first over texts.

Digital skills play a vital role in promoting information and communication technology (ICT) access which can reduce digital divide among the people (Maji and Laha, 2022). Moreover, the possession of high levels of digital skill is strongly related to engagement in technology-enhanced learning (Bergdahl et. al, 2020). This view supported by Ben Youssef et. al (2022) found that students' academic performance increases with the increased acquisition of digital skills. Despite digital skills that digital natives have, they must experience some related problems in digital skills that must be identified and addressed. Very few empirical research that dwell into digital skills related problems either actual levels of digital skills related problems or perceived levels of digital skills related problems among digital natives. Some studies that dwell into digital skills related

problems include Dutch internet users aged between 18-80 years' old who were investigated by Van Deursen and Van Dijk (2009), where the practical contribution of individual skill related problems was identified when users navigated the internet. A performance test was conducted by Deursen and Diepen (2013) to investigate the information and strategic internet skills related problems of Dutch secondary schools' students, and the digital skills related problems among Dutch primary school children were studied by Van Deursen et al. (2014)

Gómez (2018) in his study concludes that, even among young people who frequently use digital technologies, there are important asymmetries and barriers in access, skills, motivation, and emotions that limit the utility they can get from them, and these are related to their socio-cultural background and their personal processes of technological socialization. As the legacy generation in the future, digital natives must possess sufficient and good to excellent digital skills. Therefore, it is important to identify their digital skills related problems so that these problems can be addressed cautiously and effectively. The self-reported or perceived digital skills related problems on a sample of the digital natives in Malaysia were used in this study. Four digital skills including operational skills, formal skills, informational skills, and strategic skills, proposed by Van Dijk (2006) were used in this present study. According to Van Dijk (2006), operational and formal skills are fundamental digital skills while informational and strategic skills are advanced digital skills. Numerous earlier research explored digital skills and the impacts on digital usage but limited research that studied the related problems on digital skills that impacted academic digital usage and general digital usage specifically among university students. Limited research also noticeable that studied on potential predictors that influenced digital skills related problems.

**Research Questions**

i. What types of digital skill-related problems are experienced by digital natives?

ii. How do students with digital skill-related problems differ from those without such problems in terms of their digital skills?

## LITERATURE REVIEW

With the advent of technologies, digital divide continues to exist in digital skills as reported by Van Dijk (2006), Van Deursen and Van Dijk (2009), and Nor Fazlin et al (2023). In the early 21st century, Van Deursen et al (2014) on operational, formal, informational, and strategic skills as the dimensions of digital skills. In later years of 21st century, dimensions of digital skills are extended to social, creative, and mobile skills (Ahmad et al, 2019), creativity and innovation, critical thinking, communication and collaboration skills (Nor Fazlin et al, 2023 and Tee et al, 2024), and much more recently digital skills that include information and data literacy, problem-solving, and digital content creation skills which are needed in the job sectors.

Van Deursen and Van Dijk (2009) found that the major operational problems were saving files or PDF documents and the use of search engines as instruments of support while the most frequently experienced problem for individual formal skill problems, was the lack of orientation when navigating between websites, within websites, and between search results. A major information skill related problem seems to be the formulation of unsuitable or overly general search queries and the lack of knowledge about employing Booleans while for strategic skill related problems, it was revealed that the use of websites that support users in making informed decisions (e.g., voting) only caused more new problems and that subjects had trouble keeping their focus on the original goal of the assignment. Another study by [6] revealed that among the most important specific information and strategic skills related to problems the Dutch secondary school students experienced were defining proper search queries, evaluating the information found, maintaining focus, and taking the appropriate steps to reach the final goal.

## METHODOLOGY

A cross-sectional survey design was employed. Participants were 351 students aged 18 – 26 years from management sciences, social sciences and humanities, and computer science disciplines at a Malaysian public university. Data were collected via an online questionnaire. The instrument included items measuring

operational, formal, informational, and strategic digital skills, adapted from Soomro et. al (2018) and Soomro et. al (2020). Responses were rated on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). Mean scores below the overall average digital skills score (3.97) were coded as indicating skill - related problems. Descriptive statistics and one-sample t-tests were used to identify the prevalence of problems.

## RESULTS AND DISCUSSION

### Types of digital skill-related problems experienced by digital natives.

Digital skills studied were operational skills, formal skills, informational skills, and strategic skills. The present study first examined the digital skills related problems experienced by students. This was examined by analysing the mean scores of individual digital skills that were below the overall mean score of digital skills. The overall mean score of digital skills is 3.97 (SD = 0.633) ranging from 1.10 to 5.00. In addressing research question 1, one sample t test was performed. Using this statistical test, the mean values of individual digital skills were compared with the overall mean score of digital skills. Negative t value means the individual mean score of digital skill is below the overall mean value (there are digital skill related problems) while the positive t value means the individual mean score is above the overall mean value (there are no digital skill related problems) experienced by students.

Results revealed that students had significant related problems in formal skills including 52.1% students had problems in transferring files from a hard disk to a USB flash drive and vice versa ($t = -8.231$, $p < 0.001$), 43.6% experienced related problems in uploading data or a file from the computer to somewhere on the internet ($t = -5.539$, $p < 0.001$), and 39% had related problems in downloading program from the internet ($t = -3.639$, $p < 0.001$). Approximately 39% students had related problems in informational skill such as synthesizing online information ($t = -2.854$, $p < 0.01$) and 35.3% had problems in operational skill such as creating and editing a text file in a word processing program ($t = -2.717$, $p < 0.01$). Students perceived that they had no significant related problems in strategic skills. The digital skills related problems were significant in overall formal skills ($t = -7.101$, $p < 0.001$) but not in other types of digital skills indicating that students had related problems in formal skills. Results also revealed that students had related problems in informational skills but the problems were not that significant. Results indicate the related problems occurred often in formal skills, followed by informational skills, operational skills, and lastly strategic skills. Results are displayed in Table 1.

Table 1 Descriptive and inferential statistics of digital skills related problems

| Digital skills items | No. of students | % | Mean | SD | Min | Max | T (Test value = 3.97) |
|---|---|---|---|---|---|---|---|
| Creating and editing a text file in a word processing program | 124 | 35.3 | 3.83 | 0.933 | 1.00 | 5.00 | **-2.717**** |
| Create a computer presentation | 102 | 29.1 | 4.05 | 0.865 | 1.00 | 5.00 | 1.698 |
| Change some basic computer settings (wallpaper, time/date, sounds, etc.) | 71 | 20.2 | 4.23 | 0.851 | 1.00 | 5.00 | **5.675***** |
| Save images and text from the website on hard disk | 125 | 35.6 | 3.92 | 0.936 | 1.00 | 5.00 | -1.053 |
| Send an attachment to an email | 81 | 23.1 | 4.13 | 0.840 | 1.00 | 5.00 | **3.527***** |
| Total | 140 | 39.9 | 4.03 | 0.686 | 1.00 | 5.00 | 1.676 |

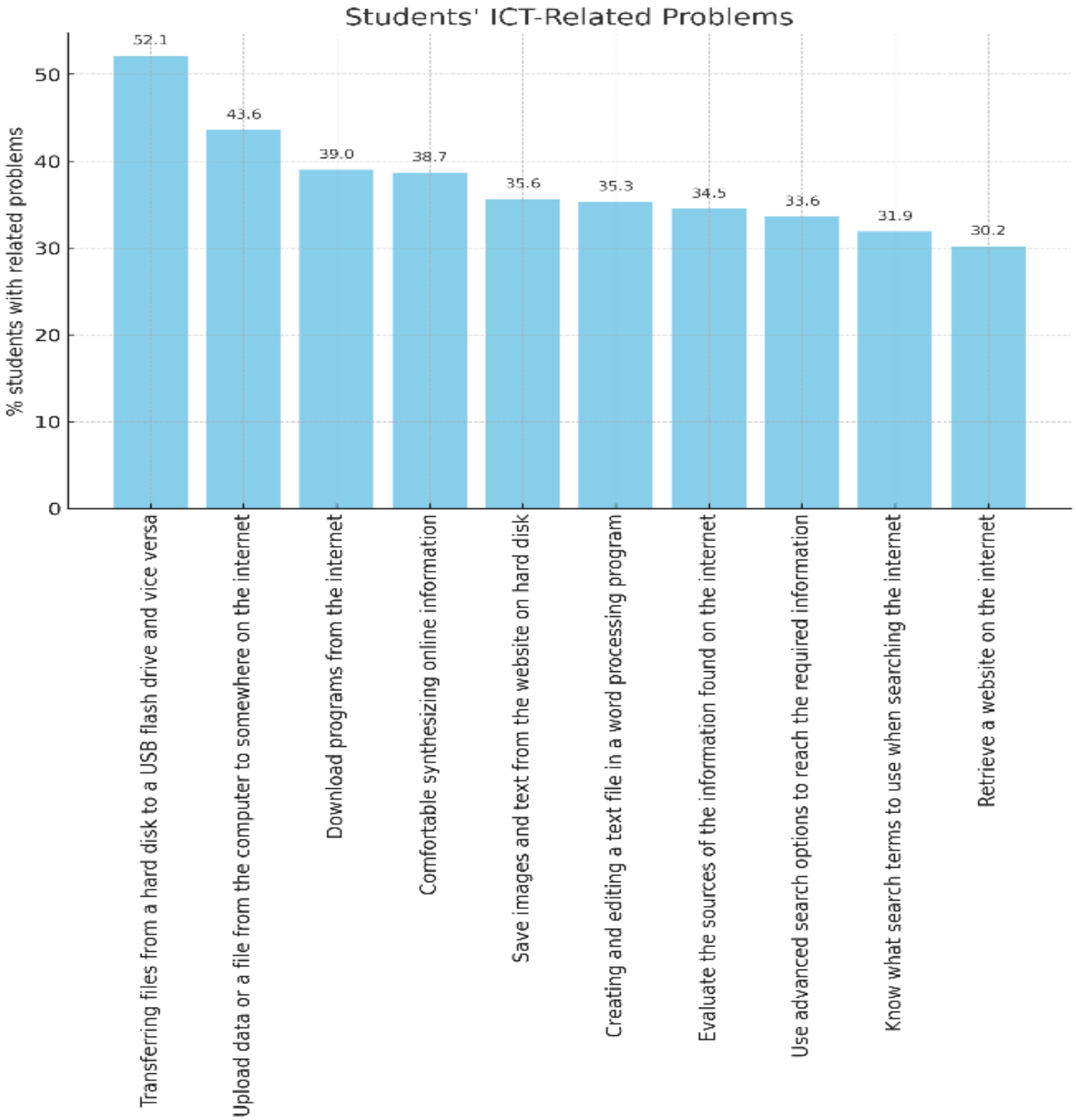
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Download programs from the internet | 137 | 39.0 | 3.79 | 0.946 | 1.00 | 5.00 | **-3.639**$^{***}$ |
| Upload data or a file from the computer to somewhere on the Internet | 153 | 43.6 | 3.69 | 0.958 | 1.00 | 5.00 | **-5.539**$^{***}$ |
| Transferring files from a hard disk to a USB flash drive and vice versa | 183 | 52.1 | 3.51 | 1.047 | 1.00 | 5.00 | **-8.231**$^{***}$ |
| Total | 205 | 58.4 | 3.66 | 0.815 | 1.33 | 5.00 | **-7.101**$^{***}$ |
| Know what search terms to use when searching the internet | 112 | 31.9 | 3.94 | 0.847 | 1.00 | 5.00 | -0.597 |
| Use advanced search options to reach the required information | 118 | 33.6 | 3.91 | 0.851 | 1.00 | 5.00 | -1.221 |
| Evaluate the sources of the information found on the internet | 121 | 34.5 | 3.89 | 0.847 | 1.00 | 5.00 | -1.668 |
| Comfortable synthesizing online information | 136 | 38.7 | 3.84 | 0.850 | 1.00 | 5.00 | **-2.854**$^{**}$ |
| Total | 155 | 44.2 | 3.90 | 0.745 | 1.25 | 5.00 | -1.807 |
| Retrieve a website on the internet | 106 | 30.2 | 3.93 | 0.833 | 1.00 | 5.00 | -0.478 |
| Easily choose from search results | 81 | 23.1 | 4.13 | 0.804 | 1.00 | 5.00 | **3.618**$^{***}$ |
| Make a choice by consulting the internet | 96 | 27.4 | 4.01 | 0.809 | 1.00 | 5.00 | 0.893 |
| Reach the intended goal while using the internet | 95 | 27.1 | 4.01 | 0.821 | 1.00 | 5.00 | 0.945 |
| Easy to work towards a specific goal on the internet | 86 | 24.5 | 4.07 | 0.811 | 1.00 | 5.00 | **2.405**$^{*}$ |
| Gain benefits from using the computer and the internet | 67 | 19.1 | 4.21 | 0.775 | 1.00 | 5.00 | **5.819**$^{***}$ |
| Achieve the goals by using various digital technologies | 91 | 25.9 | 4.03 | 0.810 | 1.00 | 5.00 | 1.353 |
| Confident in making important decisions with the help of the internet | 91 | 25.9 | 4.06 | 0.826 | 1.00 | 5.00 | **1.973**$^{*}$ |
| Total | 126 | 35.9 | 4.06 | 0.680 | 1.00 | 5.00 | **2.426**$^{*}$ |

$^{*}p < 0.05$ $^{**}p < 0.01$ $^{***}p < 0.001$

For the first category of digital skills which is formal skills, the analysis presented in figure 1 revealed that 58.4% of students reported difficulties, particularly in transferring files between devices (52.1%), uploading

data to the internet (43.6%), and downloading programs (39%). Meanwhile, for category informational skills 44.2% of students reported difficulties with common problems including synthesizing online information (38.7%) and evaluating information sources (34.5%). For operational skills, 39.9% students had issues, such as creating or editing text files (35.3%) and saving online content (35.6%). Lastly, strategic skills, 35.9% of students experienced problems such as notably retrieving websites (30.2%). Overall, formal skill-related problems were the most prevalent, while strategic skill-related problems were the least.

Figure 1 Proportion of students with ten most related problems in digital skills

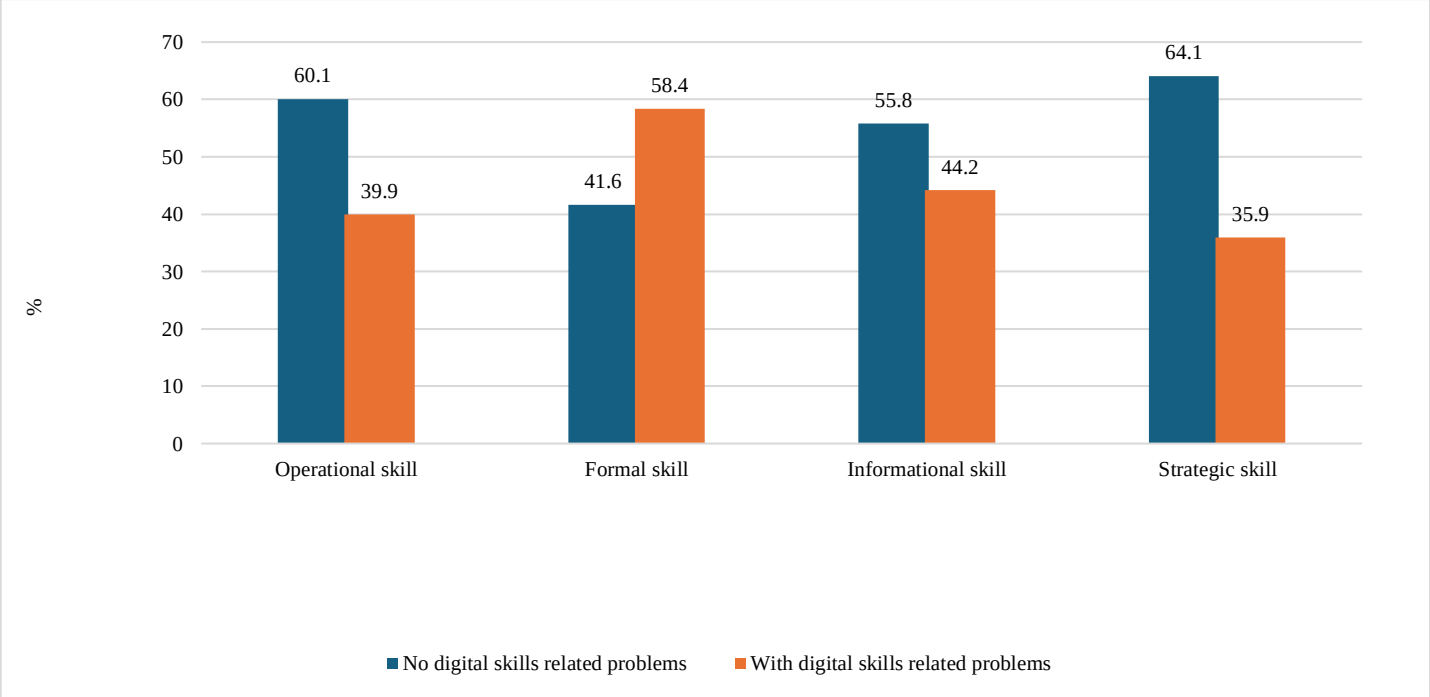



The differences between students who experience digital skill-related problems and those who do not.

To address research question 2, first, the calculated mean score for each type of digital skill and using the overall mean score of 3.97 as cut-off point, the mean score of the individual student for each type of digital skill was recoded as 0 – no digital skills related problems (calculated mean below 3.97) and 1 – with digital

skills related problems (calculated mean 3.97 or above). Figure 2 shows 58.4% students had the highest formal skills related problems, followed by 44.2% students had informational skills related problems, then 39.9% students had operational skills related problems, and 35.9% students had the least related problems in strategic skills. Figure 2 illustrates the results.

Figure 2 Proportion of students with and without digital skills related problems




Findings challenge the assumption that digital natives possess advanced digital competencies. Despite growing up with technology, students reported persistent problems in both basic and advanced digital tasks. Formal skill-related problems were particularly common, suggesting a lack of confidence in file management and internet-based operations. Similarly, difficulties in synthesizing and evaluating online information highlight gaps in higher-order digital literacy. These findings align with international studies by Van Deursen and Van Dijk (2009), and Deursen and Diepen (2013) that emphasize the persistence of skill-related challenges even among young, tech-savvy users.

In the Malaysian context, despite near-universal internet access, the existence of such problems suggests that digital fluency cannot be assumed solely based on device ownership or exposure. Structured interventions, such as digital literacy courses and workshops, are necessary to bridge these gaps and better prepare students for academic and professional tasks.

## CONCLUSION

This study demonstrates that Malaysian digital natives continue to face challenges in all four categories of digital skills, with formal skills emerging as the most problematic. Universities should prioritize digital literacy training that addresses both basic and advanced skills, focusing particularly on file management, information evaluation, and information synthesis. Such initiatives are vital not only for improving students' academic performance but also for enhancing their ability to navigate the digital world effectively. Future research could explore the difference of socio-demographic and the types of digital skills related problems predict academic digital usage and general usage.

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