

Digital Capabilities towards Students' Academic Performance

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ABSTRACT

The increasing integration of digital technologies into educational settings has significantly impacted students' academic performance. This study examined the influence of digital capabilities towards academic performance of Masters' students in the Faculty of Information Science, UiTM Puncak Perdana Campus, Selangor, Malaysia. This study employed a quantitative approach and adopted a survey method. The sample size for the study are 138 respondents out of 196 total populations. The data collected were analysed using SPSS. This study also explores the role of digital capabilities in shaping students' learning experiences and academic outcomes.

Keywords: Digital capabilities, students, academic performance, digital solution

INTRODUCTION

The growth of digital technologies in education has changed old-fashioned learning atmospheres, providing students with extraordinary contact to resources and learning tools. Digital capabilities, for instance the use of mobile devices, laptops, educational apps, and virtual classrooms, have become essential to students' academic involvements. These technologies not only backing traditional learning models but also nurture new methods of engagement and interaction, thus manipulating students' academic performance (Ng, 2012).

As an implication of enhancements in information and communication technology, information is being extended, produced, stored, processed, and transferred through electronic media. Therefore, Paul G. Zukowski invented the phrase "information literacy" in 1974 to label the technical skill employed by the information literate in modelling information solutions and issues utilising a diversity of information resources, including original sources (ACRL, 2016). Digital capabilities are a set of capabilities that needs people to identify when they needed information and to be able to locate, analyse, and effectively use that information digitally (Anandhali, 2018). Digital capabilities should be mastered by all students no matter they are from the urban or rural areas to be engaged with the latest technology these days. According to Wan Mokhtar et. al. (2024), effort expectancy, social influence and technology tool skills have influence students' performance.

Soltani and Nikou (2020) highlight that digital capabilities are usually characterised as certain abilities that students must acquire in order to ethically search, analyse (evaluate), use, and share knowledge in higher education perspectives. On the other hands, the Framework for Information Literacy in Higher Education (Framework) is constructed on the premise that information literacy as an educational reform movement can only accomplish its full prospective if a richer, more refined collection of fundamental principles is established. The six concepts that anchor the frames are presented alphabetically for example, authority is created and contextual, information creation as a process, information has value, research as inquiry, scholarship as conversation, and searching as strategic exploration (ACRL, 2016). Information literacy skills are very crucial to the digital capabilities among students in urban and rural areas additionally.

Selwyn (2016) mentions that, the role of digital capabilities in academic performance has fascinated significant attention in educational research. Numerous studies recommend that the use of digital tools can improve academic results by providing students with tailored learning experiences, increasing engagement, and facilitating collaboration. Nevertheless, the influence of digital tools is not always straightforward, as elements

like access, digital literacy, and socio-economic status play a crucial role in determining their effectiveness.

LITERATURE REVIEW

Information Literacy Skill

Concerns about false news have reignited interest in media literacy in many forms. Prevailing assumptions hold that literacy interventions can assist audiences become "inoculated" against the negative consequences of false information. An empirical study by Jones-Jang et. al. (2021) examines whether people with higher levels of literacy (media, information, news, and digital literacies) are better at detecting false news, and which of these literacies are most important. It is revealed that information literacy, but not other literacies, enhances the chance of spotting false news articles considerably. Female respondents appeared to be more discerning than males in evaluating Internet sources, and males appeared to be more confident in the credibility and accuracy of the results returned by search engines, according to a study by Taylor and Dalal (2017) which evaluated a subset of student information literacy skill in relation to Internet information sources. Moreover, Rieh et al., (2019) presented a study that used librarian role-playing to see how capable college students are of demonstrating their information literacy skill while acting as an academic librarian, and the results showed that the role-playing method can help students develop meta-cognition about their search behaviour.

Chan (2016) presents the results of a standardised exam of information literacy administered by a university library in Hong Kong, which revealed that students' information literacy skill improved throughout the course of their studies. In a focus group with 12 undergraduate students, Dawson et. al. (2012) discovered that many students are unaware of the functions of various types of sources and search tools. Many students appeared to confuse journal databases with the online catalogue after receiving instruction, and they were unsure which tool could assist them in locating journal articles. The usage of encyclopaedias is unclear, and many students are unaware of the difference between popular and scholarly publications.

In addition, a study by DaLomba et al., (2020) looked at how an embedded librarian intervention may help occupational therapy students improve their information literacy abilities. The findings suggest that occupational therapy educators and students would benefit from explicit instruction and in-person modelling of information needs identification and database search techniques to locate best evidence for practise decisions, and that this should be emphasised as a lifelong requirement of client-centred care. A quasi-experimental study by Hsieh et al., (2014) evaluated four instructional techniques for single or multi-session information literacy. The findings revealed that student understanding of subjects covered in the training increased significantly in both the control and experimental groups, but there were no differences in the teaching techniques used.

Digital Capability in Academic Perspectives

Furthermore, a study by Lanning and Mallek (2017) analysed a variety of factors from current university students' high school experiences, such as demographic, educational, and economic factors, as well as current standing and grade point average (GPA), to assess the students' digital capabilities skill in relation to a 1000-level information literacy and digital capabilities course that is part of the university's general education requirement. Finally, only current university GPA and standardised test scores have any effect on information literacy and digital capabilities test results, according to regression studies.

A review on the critical digital capabilities by Tewell (2015) discovered that critical it is a valuable lens through which to examine and critique job and skill-based education, and that education should serve a purpose other than producing efficient employees. digital capabilities are immersed in, formed by, and shaped by the context in which it is embedded, according to all three theoretical perspectives. Meanwhile, Jacobson and Mackey (2013) proposed meta-literacy to allows learners to participate in interactive information environments, armed with the ability to continually reflect, alter, and contribute as critical thinkers, according to a proposal to redefine digital capabilities.

Diehm and Lupton (2014) found out that students learn information literacy in six ways: how to find information; how to use information to create a product; how to use information to build a personal knowledge base; how to

use information to advance disciplinary knowledge; and how to use information to grow as a person and contribute to others. In addition, a study by Radolovic (2018) which examined the relationship between digital capabilities and the education phenomena, as well as changes in educational results, in order to identify the key challenges that digital capabilities face in the context of education. The survey's findings indicate that issues and topics related to digital capabilities are certainly a requirement in the area of education in the current day. With primary sources, an article offers the structure for a set of standards and objectives that would be considered digital capabilities. Simultaneously, these principles provide a framework for archivists and librarians to evaluate their work with teachers and students (Carini, 2016).

There is no significant influence of digital capabilities on student academic performance, which contradicted prior findings by other researchers who indicated that rising levels of digital capabilities might enhance students' academic grades owing to specific factors (Mohd Idzwan et al., 2011). However, Foord (2020) found out that students did engage with digital capabilities and there was an improvement academically.

Digital Capabilities and Student Engagement

One of the primary benefits of digital capabilities is their potential to increase student engagement. Digital tools such as interactive multimedia, gamification elements, and online discussions provide opportunities for active participation and deeper learning. Research by Jisc (2014) highlights that students using digital resources often exhibit higher levels of engagement, which in turn positively affects their academic performance. Furthermore, Siemens (2005) mentions that learning management systems (LMS) such as Moodle and Blackboard have been found to improve communication between students and instructors, fostering a collaborative learning environment.

Online resources also provide students with immediate access to a wide range of materials, including lecture notes, videos, and peer-reviewed articles, which support self-directed learning. According to Johnson et al. (2016) this accessibility helps students to engage more effectively with their studies, as they can explore content beyond the classroom environment and at their own pace.

Singh and Mishra (2021) inform that active use of digital tools in schools and learning centers requires not only student access but also educators training. They added that, educators often lack the necessary professional development to assimilate digital tools into the curriculum effectively, which in turn influences students' academic performance.

Digital Capability and Academic Performance

Ng (2012) informs that digital capability, can be defined as the ability to use digital technologies effectively, is a critical factor influencing the impact of digital tools on academic performance. Students who possess strong digital capability skills are more likely to leverage technology effectively to enhance their learning. In contrast, students with low digital capability may struggle to navigate digital platforms, which can hinder their academic performance.

Digital capability includes not only the technical ability to use devices and software but also the cognitive skills necessary for evaluating and synthesizing information found online. A study by Vuorikari et. al. (2016) emphasized that digital capability influences students' capacity to engage with content critically and to use technology for problem-solving and independent learning. Educators are thus tasked with fostering digital capability skills among students to ensure that they can fully benefit from digital learning tools.

Chen and Zhang (2023) inform that studies have demonstrated that digital capability (the ability to effectively use digital tools and platforms) can lead to better academic performance, especially when students are provided training in using these tools. At the end of the day, the use of digital tools for learning (e.g., online research, educational apps) can enhance student engagement and improve outcomes.

The Role of Educational Apps and Online Platforms

The proliferation of educational apps and online platforms has revolutionized the way students access learning

materials and engage with their coursework. Applications like Google Classroom, Kahoot, and Quizlet provide interactive and user-friendly platforms for students to collaborate, test their knowledge, and receive immediate feedback. Martin et al. (2017) demonstrates that students who regularly use educational apps report higher levels of satisfaction and academic achievement.

Moreover, online platforms offer opportunities for personalized learning, allowing students to progress at their own pace and receive tailored content based on their needs. McTighe and Wiggins (2013) highlight that the use of adaptive learning technologies, such as those embedded in platforms like Duolingo and Khan Academy, allows for individualized feedback, which can be crucial for improving academic performance.

Akram and Ali (2022) highlight that, online learning (using smartphones and other portable devices for educational purposes) has been an operative resolution with inadequate infrastructure. Online platforms permit students to access educational materials, interact with peers, and complete assignments, thus overcoming some of the restrictions of traditional classrooms.

While Soni and Reddy (2023) stress that, some places have applied community-based learning centers with internet access and digital devices, which help students bridge the digital divide. These centers provide students with access to digital tools and resources that they otherwise wouldn't have in their homes, improving academic engagement and performance. Therefore, digital capability among students is very much needed to fully utilise the digital information usage.

Challenges and Considerations

While digital capabilities offer numerous benefits, there are also challenges that must be addressed. The digital divide remains a significant concern, as students from low-income backgrounds or rural areas may not have equal access to the necessary technology. A study by Warschauer (2004) highlights that access to digital resources is often uneven, leading to disparities in academic achievement.

Furthermore, the overuse of digital tools can lead to distractions and a decline in attention span. Rosen et al. (2013) suggests that excessive use of social media and entertainment apps can negatively impact students' focus, ultimately affecting their academic performance. It is essential for educators to strike a balance between integrating digital tools for learning and managing the potential risks of digital distractions.

METHODOLOGY

This study employs the quantitative approach where it was implemented through survey method. Questionnaire was developed in a Google Form and were distributed to the respondents through student emails and WhatsApp application. The target population was a Malaysian public university in the state of Selangor namely UiTM Puncak Perdana Campus. 196 postgraduates' students pursuing the Master's programs at the Faculty of Information Science, UiTM Puncak Perdana, Shah Alam, Selangor were participated in this study.

ANALYSIS AND FINDINGS

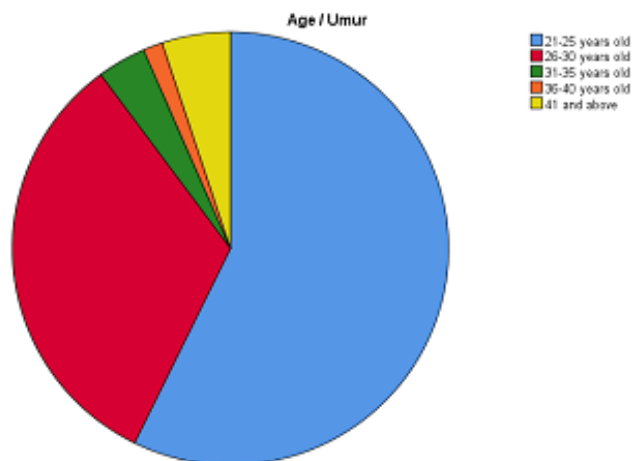
Frequency Analysis

This section will be presenting the frequency analysis of the demographic information of the respondents i.e., gender, age, program code and semester.

Table 4.1 Frequency analysis of participants according to gender

			Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	41	29.7		29.7	29.7
	Female	97	70.3		70.3	100
	Total	138	100		100	

Figure 4.1 Frequency analysis of participants according to age



From the Table 4.1, majority of the respondents are female which are 97 (70.3%) of the sample size while the remaining are male are 41 which is 29.7 %. While, from Figure 4.1, majority of the participants were aged between 21-25 years old (57.2%), followed by respondents aged 26-30 years old (32.6%) and respondents aged 41 years old and above (5.1%). The remaining were from respondents aged 31-35 years old and 36-40 years, which were 3.6% and 1.4% respectively.

Table 4.2 Overall Mean Score of Independent Variables

Independent Variables	Overall Mean Score
Searching Skill	4.22
Retrieval Skill	4.28
Evaluating Skill	4.04

The list of the independent variables with the highest overall mean in the descriptive analysis is shown in Table 4.2. It shows Retrieval Skill has the highest overall mean score (4.28), followed by Searching Skill (4.22), and Evaluating Skill (4.04) respectively.

Inferential Analysis

The chosen approach utilized for analyzing the hypotheses of this study is inferential statistics. During this step, it is usually possible to determine whether the factors do support the conclusions of the data or not. Pearson Correlational Analysis is the only inferential analysis used in this study as the tool for hypotheses testing.

Table 4.3 Correlation Table for SS, RS, ES and SAP

	ALL_SS		ALL_RS	ALL_ES	ALL_SAP
ALL_SS	Pearson Correlation	1	.454**	.728**	.763**
	Sig. (2-tailed)		0	0	0
	N	138	138	138	138
ALL_RS	Pearson Correlation	.454**	1	.550**	.399**
	Sig. (2-tailed)	0		0	0
	N	138	138	138	138
ALL_ES	Pearson Correlation	.728**	.550**	1	.653**
	Sig. (2-tailed)	0	0		0
	N	138	138	138	138
ALL_SAP	Pearson Correlation	.763**	.399**	.653**	1

	Sig. (2-tailed)	0	0	0	
N		138	138	138	138

**. Correlation is significant at the 0.01 level (2-tailed).

Based on Table 4.3, the correlation coefficient table shows that the lowest coefficient range is 0.399 and the highest is 0.763. Therefore, it indicates that Retrieval Skill has the lowest significant relationship towards Students' Academic Performance, while Searching Skill has the highest significant relationship towards the Students' Academic Performance among Masters students of FIS.

CONCLUSION

The drive of this study was to investigate the digital capabilities towards students' academic performance of Masters students pursuing studies at the Faculty of Information Science, UiTM Puncak Perdana Campus. Numerous prior studies have shown positive significant influence between digital capability and students' academic performance. Therefore, the influence of digital capability towards students' academic performance cannot be denied.

Digital capabilities have the potential to significantly enhance students' academic performance by providing them with tools that promote engagement, personalization, and collaboration. However, the effective use of these technologies depends on students' digital capability, access to devices, and the pedagogical strategies employed by educators. By addressing the challenges associated with digital equity and ensuring that students possess the necessary skills to use digital tools effectively, educational institutions can maximize the benefits of technology in improving academic outcomes.

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