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# SMARTPHONE APPLICATION USAGE AMONG NURSING STUDENTS IN IIUM KUANTAN MALAYSIA

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**Abstract**

For nursing students, mobile technology with its various features can be applied in nursing education to enhance learning outcomes, besides they are the forefront of adopting emerging technologies in healthcare. Although there is widespread use of smartphones, there is limited knowledge regarding the ownership and usage of smartphone. This study aims to investigate the current status of smartphone usage for learning among Bachelor of Nursing students at the International Islamic University Malaysia (IIUM), Kuantan Pahang Malaysia. The study utilized convenience sampling, a non-probability sampling technique that collects data from members of the population who are easily accessible and available to the researcher. The findings suggest that nursing students primarily use their smartphones for accessing educational resources in a range of academic and non-academic environments. The study reveals that nursing students in Malaysia use their smartphones primarily for accessing educational resources in various locations, such as university dormitories, and while most use only one smartphone device with Android being the preferred operating system, there is potential for encouraging greater usage of a broader range of learning-related applications through interventions promoting active and collaborative learning.

**Keywords:** Mobile Technology, Nursing Education, Mobile Learning, Smartphone Applications

## INTRODUCTION

The use of smartphones for internet access in Malaysia continues to dominate the market. According to the Malaysian Communications and Multimedia Commission's (MCMC) 2020 Internet Users Survey (Malaysian Communications and Multimedia Commission, 2020), an overwhelming 98.7% of internet users in Malaysia access the internet via their smartphones. This data also suggests a continued high demand for smartphone applications in Malaysia.

Malaysia continues to be one of the top Southeast Asian countries with the highest internet penetration, along with Singapore and Thailand, with more than 80% of the total population having internet access (ASEANUP, 2019). This indicates a society that is highly motivated to explore various disciplines of knowledge. According to the MCMC (2018), full-time students make up 12.1% of the total internet users in Malaysia, highlighting the potential for smartphone technology to revolutionize education and support the government's push for Industry 4.0. The widespread availability of the internet and smartphones in Malaysia provides opportunities for the country to further enhance its technological and educational capabilities, leading to a more competitive and innovative economy. This further support Malaysia's vision to establish itself as a prominent regional leader in the digital economy and simultaneously attain inclusive, responsible, and sustainable socioeconomic development (Malaysia Economic Planning Unit, 2021).

The advancement of mobile technology has brought about significant improvements over the years. From its early days as a simple communication tool, it has evolved to

become a device capable of performing most of the functions of a computing device. One of the most notable benefits of smartphones is their ability to assist students in accessing educational content anytime and anywhere (Ifeanyi & Chukwuere, 2018; Masrom, 2016; Mekhzoumi et al., 2018). This feature has a significant positive impact on learning outcomes. Firstly, it increases the flexibility of learning, as students can learn at their own pace and convenience (Muthuprasad et al., 2021). Secondly, it allows for personalized learning, where students can choose the content and resources that best suit their learning needs (Kacetl & Klímová, 2019). Thirdly, it facilitates collaboration and communication (Kim & Park, 2019), as students can easily connect and share information with their peers and teachers . Mobile technology with bigger screens, longer battery life, improved data processing, and larger memory systems can enhance learning by providing a more immersive and engaging experience, faster access to information, and greater flexibility in using devices for learning purposes. These features allow students to view larger images, diagrams, and videos, use educational apps for extended periods, access online resources more quickly, and store large amounts of data.

For nursing students, mobile technology with its various features can be applied in nursing education to enhance learning outcomes. For example, nursing students can use mobile devices to access educational resources such as e-books, online videos (Chuang et al., 2018; H. S. Jeong, 2017), and apps to learn and practice clinical skills (H. Jeong & Kwon, 2018). The bigger screens can provide a better view of medical diagrams, while longer battery life ensures that students can use their devices for extended periods of time in clinical settings. Although there is widespread use of smartphones, there is limited knowledge regarding the ownership and their usage by university students. It is vital to explore the utilization of smartphones among nursing students since they are often at the forefront of adopting emerging technologies in healthcare. Investigating their usage patterns can provide valuable insights into how these devices can be effectively integrated into nursing education and practice. This study aims to investigate the current status of smartphone devices and their usage for learning, including smartphone applications, among Bachelor of Nursing students at the International Islamic University Malaysia.

## METHODOLOGY

This study focuses on undergraduate nursing students who study full-time at Kulliyyah of Nursing, International Islamic University Malaysia. The inclusion criteria require respondents to be undergraduate nursing students at Kulliyyah of Nursing and have experience learning clinical skills while the exclusion criterion includes that student on leave at the time of data collection. The study utilized convenience sampling, a non-probability sampling technique that collects data from members of the population who are easily accessible and available to the researcher (Saunders et al., 2009). The sample size was calculated with a margin error of 5% and a 95% confidence interval from estimated population sample size of 335 students at the time of data collection, which is in 2019.

The survey instrument in this study was a self-administered questionnaire, adapted from the study of Mansour (2016) and Biloš et al. (2017) which has been reviewed. In this study, the first section consisted of three questions concerning basic demographic characteristics (gender, age and previous level of education). The second section was about the students' use of smartphones (year of using smartphone, number of

smartphone and type of smartphone OS in use). The third section concerning on the usage of smartphone application (level of expertise and number of learning apps). The fourth section explored the location and tasks done on the accessed smartphone application. Descriptive statistics were used to summarize the data collected and to gain a better understanding of the students' characteristics. A descriptive analysis was performed using mean (M) and standard deviation (SD).

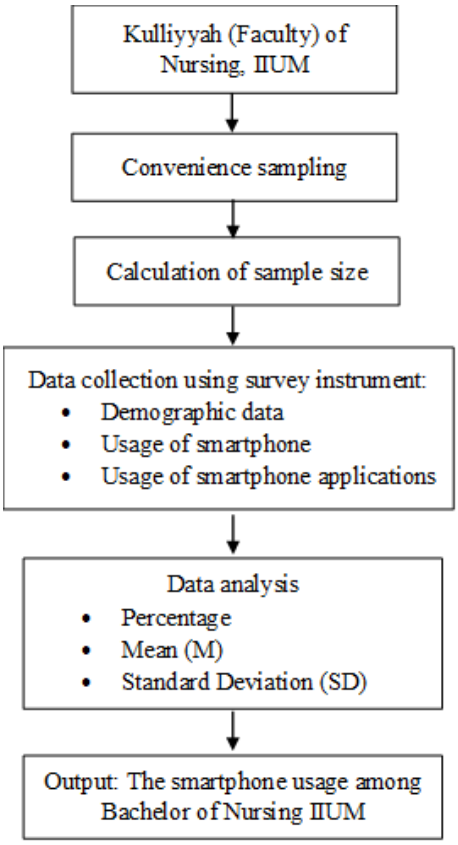


**Figure 1: Flowchart of Study Methodology**

## RESULTS

Of the total population, 74% responded to the questionnaire, with 88% of them being female and 12% male. The students were distributed across different academic levels, with 28.1% first-year students, 32.9% second-year students, 29.3% third-year students, and 9.6% fourth or final year students. The age of the participants ranged from 20 to 24 years old, with 24.1% of students being aged 20 and below, 63 students aged 21, 27.3% aged 22, and 23.3% aged 23 and above. Most students (88.4%) entered the program through the university's foundation study centre, while 10% entered through the Malaysia Higher School Certificate. This information is presented in Table I.

**Table I: Sample Characteristics**

| Variable | Participants | |
|---|---|---|
| | N | % |
| Gender | | |
| Male | 30 | 12.04 |
| Female | 219 | 87.96 |
| Year of Study | | |
| Y1 | 70 | 28.11 |
| Y2 | 82 | 32.90 |
| Y3 | 73 | 29.32 |
| Y4 | 24 | 9.64 |
| Previous level of education | | |
| Foundation study | 220 | 88.35 |
| Matriculation | 2 | 0.80 |
| Diploma | 1 | 0.40 |
| Malaysia Higher School Certificate | 25 | 10.04 |
| Other | 1 | 0.40 |

According to the survey, all students who participated were identified as users of smartphones. Table II reveals that the majority of students (53.8%) have been using smartphones for more than six years, while 37.75% have been using them for four to five years, and only 8.43% have been using them for three years or less. Additionally, most students (89.2%) use only one smartphone device, while a smaller proportion of students (10.44%) use two devices, and the least number of students (0.4%) use three or more devices simultaneously. It is worth noting that the majority of smartphones owned by students (more than 74%) use the Android operating system, followed by iOS and WinOS. It was also found that almost three quarters (72.29%) of the smartphone application users surveyed in this study perceived themselves as intermediate users, in which they occasionally download applications when there is a need or when their friends recommend something new (Biloš et al., 2017). Table III shows that the highest percentage of smartphone users (82.73%) use about one to five applications for learning purpose and another 4.42% use about six to ten applications for learning purpose. The remaining 12.45% said they have never used any learning-related applications in their smartphones.

**Table II: Usage of Smartphone**

| Variable | Participants | |
|---|---|---|
| | N | % |
| Years of using smartphone | | |
| Less than 1 year | 1 | 0.40 |
| 2 to 3 years | 20 | 8.03 |
| 4 to 5 years | 94 | 37.75 |
| More Than 6 years | 134 | 53.82 |
| Number of smartphones currently in use | | |
| One smartphone | 222 | 89.16 |
| Two smartphones at the same time | 26 | 10.44 |
| More than two smartphones at the same time | 1 | 0.40 |
| Smartphone OS currently in use | | |
| Android | 194 | 74.05 |
| iOS | 65 | 24.81 |
| WinOS | 1 | 0.38 |
| Others | 2 | 0.76 |

The survey also asked students to indicate where they typically use their smartphone applications. As shown in Table IV, the most common location for using smartphone applications among students was on their university campus (M = 5.277, SD = 0.821), followed by their home or dormitory (M = 5.1, SD = 0.95) and the clinical skills centre (M = 3.743, SD = 0.1.248).

In terms of the features of smartphone applications used for learning purposes, the survey found that the most frequently used feature was surfing the web for learning materials (M = 5.293, SD = 0.873), followed by reading lecture notes (M = 5.068, SD = 0.948) and sharing notes with classmates (M = 5.036, SD = 0.975). On the other hand, the feature of making notes was found to be the least used (M = 3.932, SD = 1.295) when using smartphone applications for learning. These results suggest that students primarily use their smartphones for accessing and consuming educational content, rather than creating and generating their own content.

**Table III: Usage of Smartphone Application**

| Variable | Participants | |
|---|---|---|
| | N | % |
| Level of expertise of using smartphone applications | | |
| Novice | 32 | 12.85 |
| Intermediate | 180 | 72.29 |
| Advanced | 37 | 14.86 |
| Expert | 0 | 0 |
| Number of learning applications | | |
| None | 31 | 12.45 |
| Yes: 1 to 5 applications | 206 | 82.73 |
| Yes: 6 to 10 applications | 11 | 4.42 |
| Yes: More than 10 applications | 1 | 0.40 |

## DISCUSSION

The majority of participants in this study were female, which reflects the gender distribution of students in the nursing faculty where nursing is generally considered a female-dominated profession in Malaysia (Abdollahimohammad et al., 2014). The age distribution of the study participants was in line with that of college students in Malaysia. Furthermore, the fact that all nursing students used smartphones highlights the widespread use of smartphones as a primary means of internet access in Malaysia.

More than half of the students surveyed had been using smartphones for over six years indicates their familiarity and established habits with this technology. The design of smartphones utilizes habit-forming technologies, and it influences human tendencies to use smartphone frequently, including repetitive checking and quick access to dynamic content. This is similar to Fook et al. (2021) reported that half of the students spent three to six hours a day on their smartphones. These habits can potentially lead to the formation of long-term habits and may have implications for the ways in which users interact with technology technology (Dai et al., 2021).

Interestingly, most students reported using only one smartphone device, which may reflect satisfaction with a single device. Besides it also indicates the difficulty in managing multiple devices. A minority of students reported using two devices, which may be due to work-related requirements or personal preferences. The ownership of

a smartphone by students is often linked to their purchasing intention, and they often find the best fit for their budget and needs (Rahim et al., 2016). However, scholars have expressed concerns that it is also apart from the impact of digital multitasking, whereby students tend to check their phones even while studying. This behavior is consistent with the results of a Hand Phone Users Survey 2021 (Malaysian Communications and Multimedia Commission, 2021) conducted in Malaysia, which found that 42.1% of users checked their phones frequently (every 30 minutes or less) even when there were no notifications.

**Table IV: Usage of Smartphone Application by Locations and Tasks Done**

| Variable | Mean | Standard deviation |
|---|---|---|
| Location of accessing smartphone applications | | |
| Home or dormitory | 5.100 | 0.950 |
| University campus | 5.277 | 0.821 |
| University library | 4.129 | 1.090 |
| In the class | 4.233 | 1.091 |
| In the clinical skills centre | 3.743 | 1.248 |
| On the go (e.g. on the bus and while walking) | 4.382 | 1.149 |
| Tasks done on smartphone applications | | |
| Look up course timetable | 4.478 | 1.239 |
| Look up portal announcements | 4.209 | 1.257 |
| E-mail faculty staff or classmates | 4.743 | 1.111 |
| Read lecture notes | 5.068 | 0.948 |
| Watch lecture videos | 4.655 | 1.087 |
| Watch instructional video | 4.639 | 1.082 |
| Do library or literature searches | 4.398 | 1.097 |
| Surf the web for learning material | 5.293 | 0.873 |
| Share notes with classmates | 5.036 | 0.975 |
| Making note | 3.932 | 1.295 |
| Record learning activities | 4.112 | 1.309 |

Notably, nursing students preferred the Android operating system over iOS, potentially due to its user-friendly interface and the availability of free applications (Susanto et al., 2016). The fact that over 74% of student-owned smartphones used the Android operating system suggests that it is the most popular among students, possibly due to affordability, customization options, or familiarity.

In terms of using smartphone application, the students considered themselves as intermediate users, indicating that there is room for improvement in user education or training to enhance the usage and effectiveness of learning-related applications. The results also suggested that students are selective in their choice of applications, with most of them using between one to five learning-related applications. Possible reasons for why students use fewer applications could include a lack of awareness or exposure to different learning-related applications, a preference for certain types of applications, or a belief that they do not need to use multiple applications to achieve their learning goals. These findings can guide the development of strategies aimed at promoting the benefits and utility of learning-related applications among this population.

These findings suggest that students use their smartphones to access educational resources in various settings, including both academic and non-academic environments. The clinical skills centre was found to be the least preferred location for

students to use smartphone applications, likely due to concerns about perceived unprofessionalism (Mcnally et al., 2017). Additionally, the results suggest that students primarily use their smartphones for accessing and consuming educational content, rather than creating and generating their own content. This information can guide the development of interventions to encourage more active and collaborative learning through the use of smartphone applications, as suggested by (Zainudin et al., 2019).

## CONCLUSION

In conclusion, this study provides insights into the usage of smartphone for learning purposes among nursing students particularly in IIUM Kuantan Pahang, Malaysia. The findings suggest that nursing students primarily use their smartphones for accessing educational resources in a range of academic and non-academic environments, with the university dormitories being the most common locations. The majority of students reported using only one smartphone device, with Android being the preferred operating system. While most students reported using one to five learning-related applications, there is potential for encouraging greater usage of a broader range of learning-related applications. The study also identified a need for interventions to enhance user education and training, as well as to promote more active and collaborative learning through the use of smartphone applications. Overall, the findings can inform the development and implementation of effective strategies to promote the use of smartphone applications for learning purposes among nursing students in Malaysia.

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