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HIGHER EDUCATION IN THE DIGITAL AGE: ASSESSING THE ROLE OF MOBILE APPS IN CAMPUS LIFE

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Abstract: *In today's digital era, mobile devices have become ubiquitous in people's lives. This research investigates the significance of mobile applications in assisting higher education students. Our approach involved the administration of a questionnaire to assess the types of mobile applications used by students and the frequency of their usage. Our findings indicate that students predominantly utilize mobile applications for educational, communication, and entertainment purposes. Notably, higher education students frequently engage with mobile applications. This study underscores the importance of mobile technology as an educational tool, particularly in facilitating efficient access to a wealth of information for learning purposes.*

Keywords: *Higher Education, Mobile Application, Digital Solutions, Digital Well-being*

Introduction

In a universe where everything is linked, the fourth industrial revolution has brought us closer than ever to deep learning, artificial intelligence, and the Internet of Things. In some manner, we are all affected by this cutting-edge technology development. Technology has touched practically every element of our everyday lives and has become indispensable to everyone's existence (Gopo, 2022). Mobile users have surpassed two and a half billion and are expected to grow to five billion by 2020. On the other hand, higher education people have been highlighted as one of the leading and largest target groups and the most active smartphone users (Al-Barashdi et al., 2015). Generation Z is the most frequent smartphone user, even though this group is disputed (Ozkan & Solmaz, 2015). Mobile device users have extremely distinct behavior when using their devices and applications, and it is critical to investigate and classify these actions in various circumstances. Students use their mobile devices to obtain courseware

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and connect with professors (Ching & Baldwin, 2020; Foti & Mendez, 2014). Using these technologies in informal learning scenarios can develop a distinct learning style and boost students' interest and competency. Nevertheless, mobile phones allow users to interact with the outside world, whether in class or at work, which can occasionally distract and interrupt their user experience.

Several issues, including transformation, pandemic, schedule, and class interruptions, besets global higher education. By enabling worldwide communication, study aids, and flexible location-based services for learners, mobile applications have the potential to improve teaching and learning in higher education institutions substantially. Furthermore, because mobile devices have grown widespread on university campuses among students and staff members in both developed and developing countries, the higher education environment is particularly well suited for adopting student-centered mobile educational applications (Atkinson et al., 2023). The effective use of mobile devices that help students in higher education must be thoroughly understood. Therefore, this research aims to: (i) determine the frequency of the usage of mobile applications in the students' learning duration and (ii) investigate if mobile applications might be used as viable educational tools in the higher education sector.

To achieve the objectives, we require additional information regarding the student population's mobile access and use to implement mobile technology across the institution properly. The findings of a campus-wide poll on mobile technology ownership and use among university students are shown here. Our research focuses on mobile technologies, specifically their use of mobile applications, learning habits, and demographic features. We seek to answer the following questions: (i) What mobile applications do higher education students use to access and interact with digital content? Do demographic considerations have an impact on access? and (ii) How frequently do higher education students use mobile technology (devices and applications) to help them with their studies? What demographic considerations have an impact on this behavior? This research project has three primary scopes: Firstly, it offers a thorough overview of e-learning, particularly on mobile applications designed to support contemporary high school students. Secondly, it restricts its consideration to papers published from 2015 onward to ensure the relevance and currency of the findings.

Lastly, the research aims to evaluate mobile applications tailored for higher education individuals, specifically focusing on soliciting feedback and suggestions to drive future improvements in these applications. While considerable study has been done on using mobile technology in higher education, several aspects that influence its use have yet to be completely investigated. We aimed to establish a baseline of mobile technology ownership and use from which future studies might be built. The findings are expected to inform possible efforts to assist learners in implementing more effective learning throughout curriculum areas. The consequences of student training, skills enhancement, and teacher assistance are discussed in detail.

Mobile Application Increase Global Competency

Mobile telecommunication technology advancements have led to a more linked globe. Nevertheless, these technologies aren't used as effectively as they may be to address global concerns (Fox & Fox, 2020). One difficult problem is the lack of preparation college/university graduates receive to actively contribute to the requirements of an interconnected global society (Ravi & Singh, 2020). Organizations such as UNESCO, NAFSA, and the OECD have lately stated the vital need for the next generation to enhance their global competency, assessing social

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challenges and collaborating with people from other backgrounds to effect change. Educators must train students to flourish in diverse cultures and handle contemporary concerns. With such a high proportion of mobile device adoption among college students, mobile devices might be perfectly placed as a multi-functional tool to aid students in acquiring these abilities (Eom, 2023). Although mobile devices may have contributed to the rising demand for internationally competent persons, this study posits that they may also be utilized to develop these skills among university students. The OECD's PISA global competency framework recommends how instructors might employ mobile technologies and research-based methods to improve students' global competence (Briciu et al., 2020; Jiménez-Chala et al., 2022; Yordanova, 2007).

Mobile Application in Education

This study discusses the use of mobile applications in higher education and subject-specific mobile applications. Mobile applications serve as a way to transmit human knowledge (Botzer & Yerushalmy, 2007). Learning is a never-ending process, and the emphasis has shifted entirely to eLearning (Ching & Baldwin, 2020; Fox & Fox, 2020; Ravi & Singh, 2020). Students may learn at their own pace and take their time understanding things due to mobile phones and numerous feature-oriented applications, as everything is just a click away (Khalitova & Gulnara, 2016). The use of mobile devices in the teaching and learning process has brought a new age in education. It improves the interaction and effectiveness of the teaching-learning process. It has the potential to assist in delivering high-quality education to anybody, everywhere. The implementation of mobile apps and technologies, in general, can provide numerous benefits to the university learning environment.

Research Methodology

In this research, we employed the Problem, Plan, Data, Analysis, and Conclusion/Communication (PPDAC) methodology (Figure 1) to structure our investigative process, consisting of five distinct phases (González et al., 2022). Phase 1 involves defining the research context, articulating the problem statement, specifying research questions, objectives, scope, and elucidating the study's significance, informed by a comprehensive review of relevant literature. Phase 2 entails data collection, where we utilized a Google Form questionnaire to gather quantitative data from a diverse sample of 45 respondents representing various higher education institutions. Phase 3 focuses on data cleansing, a critical step wherein irrelevant data unrelated to the research topic is meticulously removed to ensure the integrity and accuracy of subsequent analysis. In Phase 4, we delve into the heart of the research, analyzing and interpreting the meticulously cleansed data from Phase 3, seeking to draw meaningful conclusions from our findings. Lastly, in Phase 5, we embark on an evaluative journey to discern the mobile applications preferred by higher education students and their frequency of use in academic contexts. To execute our research, we conducted a survey utilizing a Google Form, disseminated through social media platforms such as WhatsApp and Facebook, specifically targeting higher education students at the Universiti Utara Malaysia (UUM). This survey format enabled us to collect data in both descriptive and quantitative formats, ultimately enhancing the comprehensiveness of our research findings.

Figure 1: Research Methodology

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Results

The quantitative method has been used to collect data and information in this research. A set of questionnaires was constructed for 150 UUM students. The questionnaire was distributed online to students in three main colleges of school, which are the College of Art and Sciences (CAS), College of Business (COB) And College of Law, Government and International Studies (COLGIS). All the responses gathered were analyzed to get the average percentages of all the answers.

The first section of the questionnaire is about the demographics of all the respondents. Based on the result in Table 1, the students who responded to this questionnaire came from various backgrounds (gender, age, level of education, college, and semester). The respondents were mostly females, taking up 56.7%, and there are 43.3% of male students. Meanwhile, for age, respondents are mostly in the age group of 22-25 years old, with 66% then, followed by respondents in the age group 18-21, which have 24% and 26 to 29 years old, with 10%. Meanwhile, respondents' education level is divided by foundation, bachelor's, and master's degrees. The students that participated in the questionnaire have 82.7% bachelor's degrees, 9.3% foundation and 8.0% of master's degrees. Besides we also collect data on students' semesters. The respondents in this questionnaire have 36% of semester five students, 20.7% of semester one students, 14% of semester six and above, 12.3% of semester three students, 9.3% of semester two students and 8.7% of semester four students.

Table 1: Demography of Respondents

Gender	
Male	43.30%
Female	56.70%
Age (Years)	
18-21	24.00%
22-25	66.00%
26-29	10.00%
Level of Education	
Foundation	9.30%
Bachelor's degree	82.70%
Master's degree	8.00%
College	
COB	39.30%
CAS	37.30%
COLGIS	23.30%
Semester	
First	20.70%
Second	9.30%
Third	12.30%
Forth	8.70%
Fifth	36.00%
Sixth and above	14.00%

In section 2 of the questionnaire, we investigated the mobile applications commonly used by higher education students for accessing and interacting with digital content. Based on Table 2, several Likert scale questions were posed on the topic. The first question, "I like to use my mobile device to help me know many things," received a significant response, with 55.30% of respondents strongly agreeing and 37.30% agreeing. A small percentage (7.30%) remained

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neutral, and no respondents disagreed or strongly disagreed with this statement. Question 2 also garnered positive feedback, with 47.3% strongly agreeing and 36% agreeing, while 10% remained neutral and no respondents disagreed. Question 3 showed a similar trend, with 48.7% strongly agreeing and 42.7% agreeing, but 13.30% staying neutral and 2% disagreed. These three questions indicate that most higher education students prefer using mobile applications to gather information, though some still prefer seeking information directly from people.

Moving on to question 4, we inquired about respondents' interest in using educational applications to aid their studies. A significant portion, 42% and 42.7%, strongly agreed and agreed, respectively, while 14.70% stayed neutral, and a mere 0.7% strongly disagreed. Question 5 revealed similar sentiments, with 44% strongly agreeing and 44.7% agreeing, 10.7% remaining neutral, and 0.7% disagreeing. For question 6, 48% and 36.7% of respondents liked using entertainment applications to reduce stress, while 15.30% remained neutral. These results suggest that the applications used by higher education students can be broadly categorized into educational, communication, and entertainment. This diversity reflects the multifaceted needs of these students, who require educational apps for academic support, communication apps for peer and lecturer interaction, and entertainment apps for stress relief.

Regarding question 7, most respondents indicated a willingness to share useful applications with their friends, with 44% strongly agreeing and 35.3% agreeing. However, 16.7% remained neutral, and 4% expressed reluctance to share such applications. It's important to note that sharing habits may vary among individuals due to personality and characteristics, with some possibly perceiving certain applications as not relevant to their friends' needs. Overall, the data from this section provides valuable insights into the preferences and behaviors of higher education students regarding mobile applications.

Table 2: Analysis of Responses

Questions	Likert Scale				
	Strongly Disagree	**Strongly**	**Strongly**	**Strongly**	**Strongly Agree**
Q1. I like to use my mobile device to help me know many things.	0.00%	0.00%	7.30%	37.30%	55.30%
Q2. I like to use mobile devices to access course materials anytime, anywhere.	0.00%	0.00%	10.00%	42.70%	47.30%
Q3. I like to find information through mobile applications rather than asking people.	0.00%	2.00%	13.30%	36.00%	48.70%
Q4. I like to use educational applications to ease my study.	0.70%	0.00%	14.70%	42.70%	42.00%
Q5. I like to use communication applications to communicate with my lecturers and teammates.	0.00%	0.70%	10.70%	44.70%	44.00%
Q6. I like to use entertainment applications to reduce my stress.	0.00%	0.00%	15.30%	36.70%	48.00%
Q7. I like to share useful mobile applications with my friends.	0.00%	4.00%	16.70%	35.30%	44.00%

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In section 3, we administered questions to assess the frequency with which higher education students use mobile applications to support their studies. Figure 2 indicates that most respondents primarily use mobile apps for communication, likely employing platforms such as WhatsApp, Telegram, and Discord. Moving to Figure 3, it becomes evident that a significant portion of respondents (43.3%) reported spending 4 to 5 hours on mobile devices, with a substantial 38.7% indicating that they utilize mobile devices throughout the entire day. Meanwhile, a smaller fraction (18%) mentioned spending 2 to 3 hours on mobile devices. This data underscores higher education students' substantial time allocation to mobile device usage.

Figures 4, 5, 6, and 7 offer a deeper insight into how respondents allocate their daily time to specific activities. The data suggests that a majority of respondents prefer to allocate 2 to 3 hours for educational purposes (53.3%), information-seeking (58%), communication (54%), and entertainment (38.7%). These findings indicate that higher education students strive to balance their academic commitments and leisure activities when utilizing mobile applications.

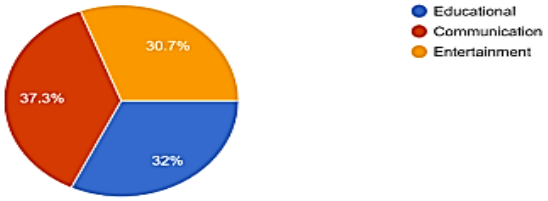

Figure 2: Types of Mobile Applications Used

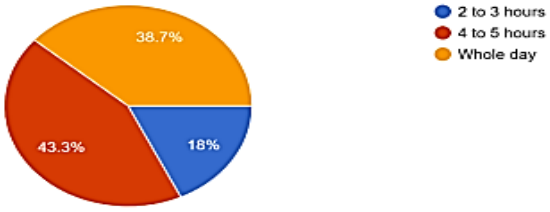

Figure 3: Time Spend on Mobile Devices

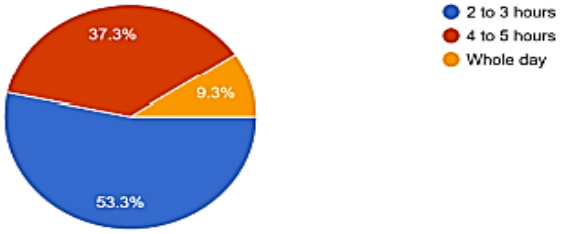

Figure 4: Time Spend in Apps for Education in a Day

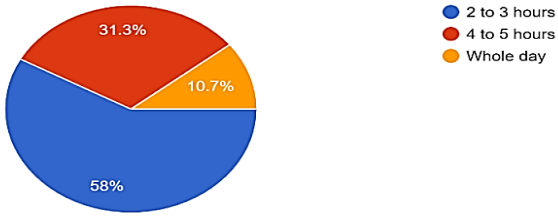

Figure 5: Time Spend Apps to Seek Information

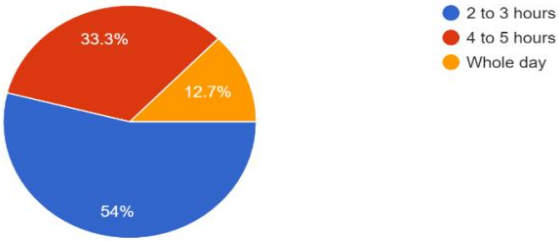

Figure 6: Time Spend on Communication Using Apps

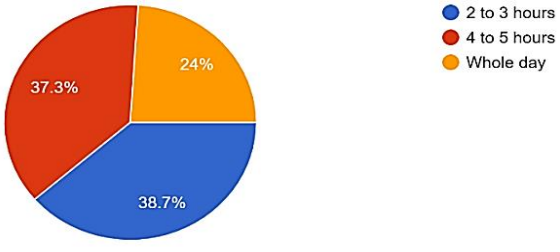

Figure 7: Time Spend on the Apps for Entertainment

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Discussion

As revealed by the study results, the implications of mobile app usage among higher education students underscore technology's transformative role in modern academia (Saidani Neffati et al., 2021). Firstly, the heavy reliance on mobile devices, with a substantial portion of students spending significant hours on these platforms, highlights the need for educational institutions to adapt their strategies. This shift towards mobile learning signifies an opportunity to provide accessible and flexible learning experiences that cater to students' preferences and lifestyles. However, it also underscores the importance of ensuring that educational content and resources are optimized for mobile consumption to enhance the quality of learning.

Secondly, the balanced allocation of time among educational activities, information-seeking, communication, and entertainment suggests that mobile apps are integral to students' daily lives, serving as educational tools and vehicles for social interaction and leisure. This duality presents educators with a unique challenge and opportunity. By integrating educational apps that align with students' interests and habits, institutions can harness the potential for learning enhancement while acknowledging the role of mobile apps in students' holistic development. Moreover, the willingness of students to share useful apps highlights the importance of building collaborative learning communities where students actively contribute to the digital learning ecosystem. In navigating these implications, higher education institutions can optimize the use of mobile apps to support and enhance the overall educational experience for their students.

Conclusion

In conclusion, this research is to study the usage of mobile applications in the students' learning duration and investigate if mobile applications might be used as viable educational tools in the higher education sector. Based on our research, higher education students will use mobile applications frequently to assist their studies. From the research, we could identify the applications students use for educational, communication and entertainment purposes. Mobile applications are suitable for learning because students can use their mobile devices to access digital content such as course materials, tests, content, and class meetings. Due to the balance of study and rest, mobile applications could reduce the stress caused by the study burden. Hence, mobile technology accelerates evaluating learning results and allows students and teachers to track progress quickly. As we need to catch a lot of information for learning, mobile technology helps as an educational tool.

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References

Al-Barashdi, H., Bouazza, A., & Jabur, N. (2015). Smartphone Addiction among University Undergraduates: A Literature Review. *Journal of Scientific Research and Reports*, *4*(3), 210–225. https://doi.org/10.9734/jsrr/2015/12245

Atkinson, R. B., Sidey-Gibbons, C., Smink, D. S., Askari, R., Pusic, A. L., Cho, N. L., Robertson, J. M., & Rangel, E. L. (2023). Real-time student feedback on the surgical learning environment: Use of a mobile application. *Journal of Surgical Education*, *80*(6), 817–825. https://doi.org/10.1016/j.jsurg.2023.02.017

Botzer, G., & Yerushalmy, M. (2007). Mobile application for mobile learning. *IADIS International Conference on Cognition and Exploratory Learning in Digital Age, CELDA 2007*, *Celda*, 313–316.

Briciu, A., Briciu, V. A., & Kavoura, A. (2020). Evaluating how "smart" Brasov, Romania can be virtually via a mobile application for cultural tourism. *Sustainability (Switzerland)*, *12*(13). https://doi.org/10.3390/su12135324

Ching, Y.-H., & Baldwin, S. J. (2020). Guidelines for Designing Online Courses for Mobile Devices. *TechTrends*, *64*, 413–422.

Eom, S. (2023). The effects of the use of mobile devices on the E-learning process and perceived learning outcomes in university online education. *E-Learning and Digital Media*, *20*(1), 80–101. https://doi.org/10.1177/20427530221107775

Foti, M. K., & Mendez, J. (2014). Mobile Learning : How students use mobile devices to support learning. *Journal of Literacy and Technology*, *15*(3), 58–78.

Fox, E. M., & Fox, E. (2020). A tool to increase global competency among higher education students. *International Review of Research in Open and Distributed Learning Students Mobile Technology*.

González, B. A. R., Ibarra, G. N. F., Barbosa, O. G., & Muñoz, H. A. D. (2022). The use of the empirical rule in the Probability class: A proposed application for university students to determine the type of statistical thinking. *Canadian Journal of Science, Mathematics and Technology Education*, *22*(3), 521–537. https://doi.org/10.1007/s42330-022-00237-y

Gopo, C. (2022). The role of technology in the 21st century education of learners. *The Official Research Journal of Tagum City Division*, *18*(6), 357–361.

Jiménez-Chala, E. A., Durantez-Fernández, C., Martín-Conty, J. L., Mohedano-Moriano, A., Martín-Rodríguez, F., & Polonio-López, B. (2022). Use of Mobile Applications to Increase Therapeutic Adherence in Adults: A Systematic Review. *Journal of Medical Systems*, *46*(12). https://doi.org/10.1007/s10916-022-01876-2

Khalitova, L., & Gulnara, G. (2016). Mobile technologies in teaching English as a foreign language in higher education: A case study of using mobile application Instagram. *9th Annual International Conference of Education, Research and Innovation*, 6155–6161.

Ozkan, M., & Solmaz, B. (2015). Mobile Addiction of Generation Z and its Effects on their Social Lifes. *Procedia - Social and Behavioral Sciences*, *205*(May), 92–98. https://doi.org/10.1016/j.sbspro.2015.09.027

Ravi, S., & Singh, E. (2020). A study on mobile applications in education. *IITM Journal Of Management And IT*, *11*(1), 91–97.

Saidani Neffati, O., Setiawan, R., Jayanthi, P., Vanithamani, S., Sharma, D. K., Regin, R., Mani, D., & Sengan, S. (2021). An educational tool for enhanced mobile e-Learning for technical higher education using mobile devices for augmented reality. *Microprocessors and Microsystems*, *83*. https://doi.org/10.1016/j.micpro.2021.104030

Yordanova, K. (2007). Mobile learning and integration of advanced technologies in education. ACM International *Conference Proceeding Series*, *285*, 1–6. https://doi.org/10.1145/1330598.1330695