# A Study to Assess the Level of Student's Perception on Mobile Learning Applications Use in Steel Structure Design Course

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## Abstract

Examining students' opinions of smartphone applications as m-learning (mobile learning) resources for Kota Kinabalu Polytechnic Steel Structure Design Course (SSDC) is the goal of this article. In addition to descriptive data, this study used a survey methodology. Thirty-one male and nine female students participated in the study, which used a structured questionnaire consisting of fifteen questions covering three areas: (1) students' inclination to use smartphones; (2) acceptance of smartphone applications as m-learning tools for SSDC; and (3) the impact of using smartphone applications in m-learning for SSDC. 93% of students believe that students use smartphones frequently, whereas 7% believe that students use smartphones infrequently (M=4.0, SD=0.638). In the SSDC, 85% of students (M=3.6, SD=0.449) had a high opinion of smartphone applications as m-learning resources, whilst 15% had an intermediate opinion. The results of the survey showed that when it comes to adopting mobile applications for m-learning, 100% of respondents identified a high level of impact for the SSDC (M=3.8, SD=0.512). As m-learning aids for SSDC, smartphones were generally viewed favourably by students, according to the results. It has a lot of promise to employ smartphone applications for m-learning for SSDC. Students can possess smartphones, which explains why. Additionally, there is evidence of a favourable influence from the use of smartphone applications for m-learning. All things considered, it is fair and reasonable for students to utilize cell phones as m-learning tools at SSDC. To make sure that the usage of smartphone applications as m-learning aids may improve SSDC instruction and learning, a number of recommendations were also made.

**Keywords**: Smartphone, M-Learning, Steel Structure Design Course (SSDC), Steel Design Smart App (SDSA)

## 1.0 Introduction

Education is considered to be one of the areas impacted by the globalization wave and the growth of information technology, in keeping with the advancements made in the field of information and communication technology worldwide, particularly through smartphone applications. Many teaching and learning activities used to occur in the classroom with books and traditional techniques like "chalk and talk." But thanks to the internet's availability and ease, anyone may now access any information and expertise from anywhere at any time, regardless of location or time constraints. Virtual learning-based teaching approaches have replaced traditional ways of instruction as a result of internet usage. A study conducted by Marhaini, Tajul Azmi, and Sarimah (2024) found a significant and very strong correlation between motivation and readiness for online learning.

The Ministry of Higher Education has instituted the industry 4.0 revolution, which involves extensive utilization of technology and the internet. According to Amir (2017), learning will occur through games and in a more dynamic, engaging, immersive, problem-based, and difficult product environment. Among the pedagogies that assist STEM (science, technology, engineering, and mathematics) learning is mobile learning. At the Polytechnic, the mobile learning approach—a component of e-learning—is also fostered and used. The major responsibility of lecturers is to guarantee that the teaching and learning process that occurs in the lecture hall is efficient and of the highest caliber in order to fulfil the goal of the Malaysian Higher Education Development Plan (PPMPT), which is to generate competent TVET Graduates. It is therefore recommended that lecturers create and utilize smartphone applications as instructional aids and learning support systems for their pupils. Learning can now occur anywhere, at any time, with the availability of smartphone applications as m-learning tools.

### 1.1 Research Background

Students in the Diploma Engineering program are required to take the SSDC course. In addition to Eurocode coding, design, analysis, computations, and theoretical knowledge or concepts, students will also learn practical skills. According to test results and student input, concepts pertaining to theories, principles, and the design process are hard for students to understand. Students become less confident and driven when answering questions on assignments and tests as a result. Furthermore, students find that softcopy notes sent by lecturers on WhatsApp and Telegram are less effective since they need them to "scroll" through their phone displays in order to locate the notes. These notes are sometimes mixed up with other information. An innovation in the shape of a smartphone application has been developed to address this issue and guarantee the efficacy of the teaching and learning process for this course. The Steel Design Smart App (SDSA) is a smartphone application that has been developed and is used as a teaching aid by lecturers in the classroom and as a mobile learning tool. Therefore, the following are the objectives of this study;

i. To identify the level of tendency to use smartphone applications among students.

ii. To identify level of acceptance of smartphone applications as m-learning tools for SSDC.

iii. To identify level of impact of using smartphone applications in m-learning for SSDC.

## 2.0 Literature Review

M-learning is a novel idea in education that stresses mobility, electronic learning, distant learning, and ICT-assisted learning that makes use of mobile devices (Nurul, Ahmad and Muhammad, 2023; Traxler, 2009; Brown, 2005; Prensky, 2001). With the availability of smartphones, the teaching and learning process may now take place anywhere, at any time, instead of being

limited to traditional classroom settings. As per Traxler (2007), mobile learning (m-learning) is more about being able to learn on-the-go, just-in-case, on-platform, and on-demand than it is about being restricted to a single classroom or platform. When m-learning is used in the teaching and learning process, instructors have more freedom to create original content, such as Android applications that are relevant to the subjects they teach. One can download this app to their smartphone. Instructors can utilize it as a teaching tool, and students can download the app to improve their comprehension of the lecture. Smartphones combine the features of a PDA and a mobile phone; they may run multimedia programs and have internet connectivity (Rosli et al., 2011). According to Nizam (2006), smartphones can be used as PDAs and come with microprocessor chips and memory modules like RAM, ROM, or Flash. Using smartphone applications in m-learning has several benefits, including the ability to boost student motivation, enhance organizational abilities, foster a sense of responsibility, promote collaborative learning, and facilitate more rapid and effective progress monitoring (Savill-Smith et al., 2003). Google Corporation, the world's largest search engine firm, supports the Android program, an open-source mobile phone operating system. According to Hamdan et al. (2012), instructors and students alike ought to seize the chance to incorporate a variety of free Android applications into their teaching strategies. As Ahamad (2010) points out, m-learning techniques have really been around for a while in developing nations like Europe and the US. Still in its infancy, m-learning is practiced in Malaysia. However, one of the earliest studies on the usage of M-Learning was done by Rahim (2013) under the title A Study on the usage of M-Learning for Learning Purposes Among Engineering Students. Next, research was conducted on how widely mobile phone m-learning is accepted in Islamic education (Nawi, et al., 2013). Subsequently, research was conducted on the application of mobile science, technology, and engineering courses in Islam (Yusoff et al., 2018) and the efficiency of al-Quran m-learning applications in raising students' hifz al-Quran achievement (Baharudin et al., 2021).

## 3.0 Methodology

The researcher's method of choice for conducting research is a survey. The survey approach is used by researchers because it is quick to execute and makes data analysis simpler. The purpose of the study was to assess how people felt about using smartphone applications as m-learning tools at SSDC (Azmira, M. & Siti Mariam, M. A., 2023). Ten students who match the real study sample in terms of characteristics participated in a pilot study. Testing the questionnaire's validity and reliability is the goal. This leads to a Cronbach's Alpha score of 0.897 for the whole question item. A high validity is indicated by this value. Mohd Salleh Abu and Zaidatun Tasir (2001) state that an instrument used in a study has good reliability if the Alpha value is more than 0.6. Using the SSDC as a basis, researchers created the smartphone app "SDSA." Civil engineering students in their fourth semester (Session II, 2022–2023) made up the study's respondents. For the purpose of the SSDC teaching and learning process, students must download this application to their smartphones. Students who completed the Google Form

link were given questionnaires to assess their opinions about the use of smartphone applications as m-learning tools at SSDC. After that, the researcher used SPSS software to analyse the raw data. This survey is divided into two sections: Part A requests personal information from the respondents, and Part B asks about their opinions about using smartphone applications as m-learning tools in SSDC Form. Students must select multiple choice answers for six demographic categories in Part A and use a 5-point Likert scale to answer fifteen items in Part B (1 being Strongly Disagree, 2 being Disagree, 3 being Not Sure, 4 being Agree, and 5 being Strongly Agree). Standard deviation, mean, frequency, and percentage are examples of descriptive statistics in use. Pallant (2007) states that the following mean score interpretation scale is in use:

Table 1: Level of tendency to use smartphone applications among students

| Mean value | Mean interpretation level |
|---|---|
| 0.00 – 1.66 | Low |
| 1.67 – 3.33 | Medium |
| 3.34 – 5.00 | High |

## 4.0 Results and Discussion

Three items make up Part A: smartphone kind, service provider, and gender. A total of 40 respondents from Semester 4 Civil Engineering students (Session II 2022/2023) participated in this study, as indicated by Table 2. 31 men (78%) and 9 women (22%), representing both sexes, participated in this study. Regarding service providers, Digi Services had the largest percentage (37%; 15 people), followed by Maxis Services (27%; 11 people), and the remaining 20% (eight people) utilizing Celcom Services. Regarding phone types, 7% (7 individuals) use iPhones and 80% (32 individuals) use Android smartphones.

Table 2: Distribution of Personal Information of Respondents

| Statement | Category | Frequency | Percentage |
|---|---|---|---|
| Gender | Male | 31 | 78 |
| | Female | 9 | 22 |
| Service provider | Digi | 15 | 37 |
| | Maxis | 11 | 27 |
| | Celcom | 8 | 20 |
| | Others | 6 | 16 |
| Type of phone | Android | 32 | 80 |
| | iPhone | 7 | 17 |
| | Others | 1 | 3 |

The degree of student smartphone use is displayed in Table 3 (Mean=4.0, SD=0.638). This particular aspect involves five items that are evaluated. These include the use of smartphones by students for online gaming and email, the use of smartphones to locate academic information, the use of smartphones exclusively for social media browsing, the use of smartphones for entertainment and daily academic use, and other uses. Table 3 indicates that of the students, 37 (93%) had a high degree of smartphone use inclination,

and 3 (7%) had a moderate level. The study's findings indicate that students frequently use their smartphones for social, educational, and recreational purposes. Their smartphone usage extends beyond online gaming and entertainment; they use it for email correspondence, social media browsing (Facebook, Instagram, etc.), and academic research. The ease with which kids can use the internet at any time and from any location is one of the elements that has been observed to impact this high tendency. These findings are consistent with a study conducted in 2021 by Shaffai and colleagues, which found that pupils had a strong propensity to utilize smartphone apps.

Table 3**:** Level of tendency to use smart phones among students

| Aspect | Score | | | |
|---|---|---|---|---|
| | High | Medium | Low | Total |
| Level of tendency to use smart phones among students | 37 | 3 | 0 | 40 |
| Percentage | 93% | 7% | 0% | 100% |

According to Table 4 (Min=3.6, SD=0.449), SSDC users' adoption of smartphone applications as m-learning tools is high. Five items are assessed: 1) like being able to use smartphone applications for teaching and learning activities; 2) enjoy using smartphones for these purposes; 3) prefer using m-learning techniques with smartphone applications over traditional methods (whiteboards); 4) use smartphone apps to communicate with lecturers, take notes, download activities, obtain up-to-date information, and complete tutorials; 5. Smartphone applications are flexible and accommodating teaching tools for mobile learning, enabling students to create exercises and retrieve notes at any time and from any location. Table 4 indicates that, of the students, 34 (85%) had a high degree of acceptability (or willingness to use smartphone applications for m-learning), and 6 (15%) had a moderate level of acceptance. The results of Shaffai et al. (2021) are corroborated by this finding. Both this transformation and the recent technology advancements are ones that the students can embrace. Using smartphone applications as m-learning aids during teaching and learning activities in the classroom actually makes them happy and piques their curiosity. The reason for this is that m-learning smartphone applications are viewed as more flexible and accommodating teaching tools. Student access to notes and exercises, for instance, is available to them at any time and location.

Table 4: Level of acceptance of smartphone applications as m-learning tools for SSDC

| Aspect | Score | | | |
|---|---|---|---|---|
| | High | Medium | Low | Total |
| Level of acceptance of smartphone applications as m-learning tools for Engineering Science course | 34 | 6 | 0 | 40 |
| Percentage | 85% | 15% | 0% | 100% |

An analysis of smartphone applications in SSDC is presented in Table 5. Five items are assessed, which are as follows: 1) Using smartphone applications as an m-learning tool for SSDC makes students more interested in learning; 2) Using smartphone applications as m-learning tools saves money and reduces the need for paper; 3) Using smartphone applications in m-learning is not boring; 4) Using smartphone applications allows students to learn at any time or location; and 5) Using smartphone applications as m-learning tools makes it easier for students to connect with lecturers during class. 45 students, or 81% of the total, demonstrated a high level of influence on the use of smartphone applications in m-learning for SSDC, according to Table 5. Of the remaining kids, eleven (19%) demonstrated a moderate level. Item number five had the highest mean score. Students can access resources, information, and lecturer connections more easily when they use cell phones for mobile learning. The use of smartphone applications by students is observed to be enjoyable in SSDC. These results corroborate those of a study conducted in 2020 by Darmaji and colleagues, which demonstrates a highly favourable influence on smartphone use in physics courses. Students are more engaged in their studies and have the flexibility to learn at any time and from any location when they utilize smartphone applications as an m-learning tool for SSDC. Of course, there are financial savings associated with buying paper and printing, but the biggest effect of using smartphone applications for m-learning is that it reduces paper use indirectly. Since they may now access information through online resources, students no longer need to scour the library for reference materials in order to discover information.

Table 5: level of impact of using smartphone applications in m-learning for SSDC

| Aspect | Score | | | |
|---|---|---|---|---|
| | High | Medium | Low | Total |
| Level of impact of using smartphone applications in m-learning for Engineering Science Course | 40 | 0 | 0 | 40 |
| Percentage | 100% | 0% | 0% | 100% |

Teaching and learning are made more flexible and accommodating by utilizing the SDSA in conjunction with the m-learning method. The utilization of smartphone applications in m-learning for SSDC provides researchers with a basic understanding of the benefits of implementing this approach. In addition, it provides instructors with the opportunity to investigate the m-learning potential of smartphone applications by creating applications that align with the course curriculum.

## 5.0 Conclusion(s)

According to the study's findings, students generally use smartphone applications in their daily lives, and they are generally open to using these apps as m-learning aids, particularly for SSDC. Moreover, it has been demonstrated that using the program helps students learn more and increases their motivation to learn in a supportive environment during instruction. The created smartphone applications exhibit significant potential for growth. Thus, it is important to investigate and put into practice the usage of smartphone applications for m-learning in order to guarantee better delivery quality and an enhanced teaching and learning process for Steel Structure Design.

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**Author Contributions**

**Rackford, B.**: The author conceived and design the study, collected and analyzed the data, interpreted the results, and drafted the manuscript.

**Conflicts of Interest**

The author declares no conflicts of interest regarding the publication of this research.

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