

# Development of Teaching Model Mobile Seamless Learning as Future Teaching Guide

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## Abstract

The effective teaching and learning process in a class is one of the important aspects that need to be emphasized nowadays. There are various ways for teachers to plan teaching content in our education system. The development of mobile technology such as smart phones can help student learning happen outside of context, that is, it can happen regardless of time and place without being bound by space and time. This has the opportunity to create learning that occurs naturally. Students can be equipped with facilities so that they can go through the learning process without having to think about time constraints and where as long as it suits their wishes. Therefore, accurate teaching concepts and planning in preparation for effective learning for students are very necessary when using mobile technology. This is an

innovative method where students are exposed to the outside world through technology. However, the implementation of this method is not as easy as expected if there is not enough support from teachers as teaching staff. The learning process that takes place without time and space limitations that contains the concepts of fluency and continuity is a teaching model known as Mobile Seamless Learning (MSL). This article explains the concept without limitations in developing teaching and learning based on MSL.

**Keywords:** seamless learning; mobile seamless learning; mobile technology; smart phone

## 1. Introduction

The role of teachers in mobilizing comprehensive and integrated digital education through educational transformation that enables creative and innovative use of digital technology needs to be enacted to ensure that the country's future generations are able to face the digital wave and post-pandemic challenges of COVID-19 so that they are able to compete in the digital era. Digital education is a teaching and learning process that applies digital technology in an integrated, creative and innovative manner to produce digitally fluent students. Digitally savvy students are defined as students who are able to achieve creative and innovative use of digital technology to:

- Create and produce innovations.
- Analyse data scientifically.
- Solve problems.
- Improve the effectiveness of communication and collaboration.
- Use technology safely, responsibly and ethically.

In the era of IR4.0, students need to be given sufficient exposure and knowledge so that they will become a digitally savvy generation in the future. For that purpose, teachers need to prepare themselves with digital competence skills so that they can guide students towards achieving that goal. Issues and challenges, especially during the closure of all schools as a result of the COVID-19 pandemic, have made teaching and learning at home a new normal in the world of education around the world. Among the issues and challenges that need to be addressed strategically by BSTP, or the Strategic Core of Strengthening the Integration of Educational Technology, is that teachers need to improve their skills in integrating digital technology in teaching and learning. The Ministry of Education Malaysia (MOE) always ensures that the development of the world of digital technology in education in Malaysia moves along with the needs of teachers and students today.

Therefore, a new teaching model should be introduced to improve teaching and learning activities especially in primary schools, increasing interest and motivation among students. Teachers need to be exposed to the latest teaching techniques in accordance with the development of increasingly sophisticated and advanced mobile technology. It can further improve the professionalism of teachers, which indirectly has a good effect on student learning, as well as improving the achievement of students in primary schools in particular.

The purpose of this study is to develop and evaluate a new teaching model, the Mobile Seamless Learning (MSL) teaching model, which will be used in teaching Science in primary schools. The use of this teaching model is expected to enable teachers to practice the use of technology in their teaching and at the same time enable student learning to occur outside of context, that is, it can occur regardless of time and place without being bound by space and time.

### *1.1 Seamless Learning*

Nowadays, learning theories and concepts do not only emphasize the social interaction between teachers and students with the learning environment alone, but the emphasis is more on the learning process that occurs naturally in which the student himself is an active person in the process. Along with the 21st century, the time has come for students to be given the opportunity to choose their own learning methods and styles, where students can decide when and where they can study a subject. In addition, emotional mood or the desire to learn for everyone can happen regardless of time and place until it happens, students need to be equipped so that they can learn immediately, including preparation in terms of learning resources, learning media and learning environment. With these conditions, allowing students to learn in various conditions, the learning process can occur in formal or informal conditions, whether in class or outside of class, individually or in groups, digital and non-digital media, or even in the environment whether it is a physical or virtual environment.

According to Chan et al. (2006), the continuity of learning through various conditions is known as the term Seamless Learning. Chan et al. have adopted the term Seamless Learning for all activities characterized by the continuity of learning experiences through different learning contexts by using mobile and ubiquitous technology, in this regard mobile devices such as smartphones play a major role in Seamless Learning.

### *1.2 Mobile Seamless Learning*

Seamless learning can be understood as a continuous learning experience in various contexts (Wong, 2012). Boundless learning enables continuous learning experiences in various environments, such as at school or at home (Alokaily, 2019), while boundless learning is spread through various environments (Toh et al. 2013). Referring to Safiah et al. (2020), borderless learning is a seamless network where it takes place without time limits and anywhere. Unlimited learning refers to the seamless integration of learning environment boundaries covering several dimensions, including formal and informal learning contexts, individual and social learning, as well as the physical and virtual world (Hidayat & Khotimah, 2019) through various processes and learning spaces whether (in or out of class). MSL is also a learning model where a personal mobile device as a mediator easily, quickly, and seamlessly changes learning and cognitive activities from one scenario or context to another (Chan et al., 2006).

Combining two learning models and combining them, can optimize the benefits of each in every respect. This can help increase the number of learning activities that can be accessed by students through structured and interactive learning (Wong & Looi, 2011). There are ten

dimensions of MSL, namely: (1) including informal and formal teaching; (2) social and individual teaching; (3) across place / location; (4) across time; (5) access to knowledge / resources everywhere; (6) covering the digital and physical world; (7) the combined use of several types of devices; (8) switching between tasks; (9) synthesis of knowledge; and (10) covering several models of pedagogical activities (Wong et al., 2015)

### *1.3 Past Studies in Science Teaching and Learning*

The study by Jusup and Sharif (2021) is related to the development of a primary school stem integration energy literacy learning module in a needs analysis conducted to identify issues and problems related to energy and electricity for primary school students in the Kota Kinabalu district, Malaysia. This study was conducted qualitatively through semi-structured interviews (3 teachers and 4 students) and quantitatively using questionnaires (100 students). The results of the qualitative study obtained meet the characteristics of the requirements stated by Morrison et al. that is: i) existing needs of students and teachers; and ii) emotional needs of students and teachers. The existing needs of students and teachers are examined through topics that are difficult to teach and learn, students' learning experiences, teachers' teaching practices and the problems faced by teachers when teaching those topics. Meanwhile, based on the findings from the questionnaire for the learning title Energy and Electricity, the module development requirement item showed a high percentage compared to all the items in the questionnaire. In conclusion, the need for the development of this module should be emphasized so that energy literacy, which includes aspects of students' knowledge, attitude and behavior towards energy, can be improved.

Next, a study by Rahim et al. (2021) focused on the impact and effect of cooperative learning styles in social stimulus on the learning of science subjects. The case study was conducted at a national school located in Rawang, Selangor. A science teacher with 16 years of teaching experience was interviewed with 10 semi-structured interview questions. The findings of the study show that the cooperative learning style can attract interest and increase the understanding of year 4, 5 and 6 students in the science subject. Furthermore, it also shows the characteristics of students who meet the aspirations of national education. It refers to various types of skills such as communication and interaction, thinking creatively and critically, problem solving, working in groups, socializing and social values and leadership that can be indirectly applied in their implementation.

Poobalan et al. (2019) have conducted a study on the use of 'Scratch' which is an interactive 3D animated multimedia material with blended learning techniques on the interests and achievements of Year 5 students in science subjects. In order to improve the achievement of Science subjects, researchers have combined Scratch and blended learning. Science learning is conducted by combining 'online' and conventional learning techniques. Through this study, the researchers found that the use of multimedia materials such as 'Scratch' in the subject of science can have a positive impact through aspects of its use. This shows that the problem of low student performance through teaching techniques without using multimedia materials and teacher-centered can be overcome by giving students the opportunity to use the 'Scratch' application during the learning process.

#### *1.4 Issues and Challenges in Science Teaching and Learning (Elementary School)*

There are various issues and challenges related to the teaching and learning of science subjects in primary schools. The development of information technology will certainly challenge the credibility of teachers in changing education today. The teacher is no longer an important factor as a transmitter of knowledge. This is because the role of a teacher will change from someone who only teaches and educates to a facilitator, planner, tutor, and evaluator of student learning. The first issue that can be identified in the teaching and learning of science in primary schools is in terms of constraints on ICT facilities such as devices or internet access or sufficient basics, especially for students in rural schools. In urban schools, some teachers still maintain the traditional "chalk and talk" teaching technique. This is because they lack exposure or guidance regarding knowledge to take advantage of the ICT facilities available at school. It can simultaneously affect students' interest in learning as well as exam achievement in science subjects (Poobalan et al., 2019).

The second issue is related to the teacher's teaching strategy or method. A number of students lose interest or focus (Nasip & Tek, 2022) in the subject of science due to the teacher's traditional teaching strategy or method, which is not using information technology (Muslihin et al., 2018) in imparting knowledge. Among the important factors that affect a person's learning achievement is a person's interest (Rusmiati, 2017). For students of the 21st century generation who are always exposed to sophistication and access to various information through the internet, they are more interested in the use of technology such as video screenings or activities in the classroom. This is because traditional teaching methods have weaknesses because science concepts and facts are usually abstract and difficult to understand.

Besides that, most science teachers face the problem of a lack of time (Akhbar & Mazlini, 2018) to solve the topics for the dense science subjects. Among the factors that cause this issue to occur is due to various other activities carried out at school or Science teachers who need to attend workshops, courses and others. This is because, in a year, a minimum of 48 hours are allocated for Level 1 and 64 hours for Level 2 for science subjects (MOE, 2019).

## **2. Method**

Based on this study, the design development research (DDR) research method was chosen because it is compatible with the purpose of the study to be carried out, which is to develop and evaluate the MSL teaching model for primary schools. In this section, the researcher will explain the methodology used in the development of the proposed teaching model. The formulated methodology is based on empirical design development research (DDR) (Richey & Klien, 2007). It emphasizes that the instructional design process is like a scientific problem-solving process. Richey & Klien (2007) say that using the DDR approach is very systematic which involves the process of analyzing needs, the design and development process and then the evaluation where it is an empirical study.

Support from other scholars who use DDR indicates that this method is approachable for developing measurement tools, products and processes. While Hevner et al. (2004) and Ellis

and Levy (2008) assert that the DDR approach can be used as a guideline in the following research:

- Produce a new theory for solving problems.
- Design and development of new models in a field of study.
- Development of new methods and processes in existing implementation models or equipment.

Ellis and Levy (2008) clearly state that the DDR approach is not a product, but it is closely related to research, these criteria are as follows:

- Studies were conducted to solve problems.
- Studies were conducted based on literature and empirical studies.
- Research were conducted to contribute to the body of knowledge.

Based on criteria 1, this research aims to solve the problem. So, at an early stage, researchers have identified the important need for test effort estimation in regression testing. Using criteria 2, this study was conducted based on literature and empirical studies. Ellis and Levy (2008) support the idea that literature is important because it will include the needs, interests, and problems that lead to research. Ven den Akker et al. (2006) expressed the same opinion that for research studies, design and development process, it should involve theoretically, literature exploration. Finally, for criteria 3 studies conducted to contribute to the body of knowledge. The contribution can be made in various ways and is supported by Richey and Klien (2007) stating that DDR is able to develop approaches and improve existing knowledge leading to various new areas of research. Table 1 shows the summary of the DDR approach to be taken, along with the techniques used.

Table 1. Summary of DDR approach and techniques to undertake

<b>Phase</b>	<b>Technique used</b>
1) Need Analysis	Literature Review
2) Design and Development	Fuzzy Delphi Method (FDM)
3) Usability Assessment	Nominal Group Technique (NGT)

In DDR, the first phase is the needs analysis. The process involved in this study is a literature review, resulting in the identification of the research problem and the elements in the proposed model. In the second phase, the researcher designs and develops this model based on expert opinion. The evaluation and validation process will use the Fuzzy Delphi Method (FDM). The usability analysis completes the final phase. It is designed to evaluate the applicability of the proposed model using the Nominal Group Technique (NGT). This study shows the three phases carried out for the development of the model.

### 3. Conclusion

This MSL teaching model can be a good alternative to the existing teaching model. This is because there are various advantages offered by this teaching model that can make the student's teaching and learning process more meaningful. The analysis of previous studies shows that this model is suitable for use in the context of education in primary schools abroad. Thus, there is a need to develop and evaluate this model to be developed in the context of education in Malaysia.

From a theoretical point of view, this concept paper has provided an overview and preliminary information about the advantages of using this teaching model in primary schools. With the results of the latest research findings regarding the use of this MSL model among teachers in primary schools, especially in science subjects, it will be able to help the relevant parties such as teachers, the Education Technology Sector Division, the Malaysian Teacher Education Institute and the Curriculum Development Division at Ministry of Education (MOE) to practice this teaching model in the future.

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