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Perpustakaan Tuanku Bainun
Kampus Sultan Abdul Jalil Shah



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THE DEVELOPMENT OF ACCOUNTING
MOBILE LEARNING APPLICATION TOWARD
HANCEMENT OF COGNITIVE LEARNING
OUTCOME, ENGAGEMENT AND
MOBILE SELF-EFFICACY
AMONG UNIVERSITY
STUDENTS IN
INDONESIA



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DHANY EFITA SARI

SULTAN IDRIS EDUCATION UNIVERSITY

2024



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TOWARD ENHANCEMENT OF COGNITIVE LEARNING OUTCOME,
ENGAGEMENT AND MOBILE SELF-EFFICACY AMONG
UNIVERSITY STUDENTS IN
INDONESIA

DHANY EFITA SARI

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SULTAN IDRIS EDUCATION UNIVERSITY

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ABSTRACT

This research was conducted at an Indonesian university, explores the multifaceted impact of a mobile learning application (MLA) on cognitive learning outcomes (CLO), student engagement (SE), and mobile self-efficacy (MSE) within an introductory accounting course. Employing Richey and Klein's Design and Development Research (DDR) model, the study spans need analysis, design and development, and evaluation stages. Adopting a quasi-experimental approach integral to DDR methodology, the research employs t-tests and MANOVA to comprehensively assess MLA's effects on CLO, SE, and MSE. The study draws theoretical underpinnings from Bandura's socio-cognitive theory and Piaget and Vygotsky's constructivism theory, providing a robust framework for understanding the interplay of MLA within the educational context. Aligned with DDR principles, primary objectives encompass evaluating MLA's feasibility and gauging its impact on cognitive learning outcomes, student engagement, and mobile self-efficacy. The evaluation phase involves 101 second-semester students in a quasi-experimental design, with an experimental group utilizing MLA and a control group undergoing traditional instruction. Results demonstrate MLA's acceptability and significant positive effects on CLO, SE, and MSE, showcasing its potential to enhance various aspects of the learning experience. The study's results suggest that incorporating MLA into educational practices could significantly enhance CLO, SE, and MSE in introductory accounting courses. Therefore, it endorses the widespread adoption of MLA to advance educational strategies.





PEMBANGUNAN APLIKASI PEMBELAJARAN MUDAH ALIH UNTUK MENINGKATKAN HASIL PEMBELAJARAN KOGNITIF, PENGLIBATAN DAN KECEKAPAN DIRI MUDAH DI KALANGAN PELAJAR UNIVERSITI DI INDONESIA

ABSTRAK

Kajian ini dilakukan di sebuah universiti di Indonesia bagi meneroka impak serba sisi aplikasi pembelajaran mudah alih (MLA) terhadap hasil pembelajaran kognitif (CLO), penglibatan pelajar (SE), dan keberkesanan sendiri mudah alih (MSE) dalam kursus perakaunan pengenalan. Dengan menggunakan Model Penyelidikan Reka Bentuk dan Pembangunan (DDR) Richey dan Klein, kajian merangkumi fasa analisis keperluan, reka bentuk dan pembangunan, serta penilaian. Kajian menggunakan pendekatan kuasi-eksperimen yang penting dalam metodologi DDR, ujian t dan MANOVA untuk menilai secara menyeluruh kesan MLA terhadap CLO, SE, dan MSE. Kajian menarik asas teori dari teori sosio-kognitif Bandura dan teori konstruktivisme Piaget dan Vygotsky bagi memberikan kerangka yang kukuh untuk memahami interaksi MLA dalam konteks pendidikan. Selaras dengan prinsip DDR, objektif utama merangkumi menilai kebolegunaan MLA dan mengukur impaknya terhadap CLO, SE, dan MSE. Fasa penilaian melibatkan 101 pelajar semester dua dalam reka bentuk kuasi-eksperimen, dengan kumpulan eksperimen menggunakan MLA dan kumpulan kawalan menerima pengajaran tradisional. Keputusan menunjukkan kebolegunaan MLA dan kesan positif yang signifikan terhadap CLO, SE, dan MSE, menunjukkan potensinya untuk meningkatkan pelbagai aspek pengalaman pembelajaran. Hasil kajian ini menunjukkan bahawa memasukkan MLA ke dalam amalan pendidikan boleh meningkatkan CLO, SE, dan MSE dalam kursus perakaunan pengenalan. Oleh itu, ia menyokong penerimaan meluas MLA untuk memajukan strategi pendidikan.





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LIST OF ABBREVIATIONS

ACE	One of the accounting mobile learning applications’title
CMCT	Cognitive Multiple-choice Test
DG.MP	Discussion Guide for Multimedia Programmer
FGD	Focus Group Discussion
IP.CE	Interview Protocol for Content Expert
IP.EEA	Interview Protocol for Expert in Educational Apps
IP.IL	Interview Protocol for Instructional Language Expert
IP.ITS	Interview Protocol for Information and Technology Staff
MOEC	Ministry of Education and Culture
MLA	Mobile Learning Application
MSEQ	Mobile Self-efficacy Questionnaire
NAQ.L	Need Analysis Questionnaire for Lecturer
NAQ.S	Need Analysis Questionnaire for Student
SEQ	Student Engagement Questionnaire
SPSS	<i>Statistical Packages for The Social Science</i>

CHAPTER 1

INTRODUCTION

1.1. Introduction

Nowadays, integration of technology developments has influenced our cultures, and have fully changed people's way of life. Technology have penetrated into everyday human life in various ways and fields of life, as part of this, in education. Therefore, educational process at this time cannot be separated from the use of technology. Trepule, Tereseviciene, and Rutkiene (Trepule et al., 2015) agree that Information and Communication Technology (ICT) directly cannot improve the educational process, but ICT can trigger the use of innovative learning methods, therefore the learning process becomes efficient and attractive to students, especially in higher education.



The use of technology in the learning process in higher education has been widely carried out by several countries in the world. For instance, Electronic Information Educational Environment (EIEE), Russia has implemented a new educational standard in higher education through EIEE. EIEE in Russia has required certain standards for the learning process at the level of higher education which include several things, namely 1) revision and elaboration of textbooks used as learning material is done as often as possible; 2) development of website-based teaching material resources and certain resources; 3) use of professional software available on the internet; 4) development of their own certain software, including the use of mobile technology in the learning process (Golitsyna, 2017).

In addition, in the Midwestern, US, Lim & Richardson (2016) highlighted the use of Social Networking Sites (SNSs) such as Facebook, LinkedIn, Twitter, Myspace, and other social media, which is associated with students' perceptions in use of SNSs for educational purposes. The results show students often use SNSs in their daily lives and they show positive perceptions to use SNSs in the context of educational and learning goals.

The use of technology for advancing learning process actually began when electronic learning (e-learning) emerged in the late 1980's and 1990's (Crompton, 2019) . Since then, handheld devices have grown everywhere because of business communication, game media, and in general as a supporter of the lifestyle of the wireless community (Hashemi et al., 2011) . E-learning is the forerunner to the development of mobile learning. Mobile learning began to be developed in the early





2000's, because of cellular phone ownership expanded and increased in the availability of other portable and wireless devices that supports the learning process.

Technology implementation turns out to be aligned with strategic educational goals such as increasing student achievement and retention, supporting learning needs, and reaching students who will not have the opportunity to participate in education (Kukulska-Hulme & Traxler, 2005) . Considerable effort has also been dedicated to comprehending how cellular technology facilitates the connection between conventional learning and creative learning, while also showcasing the practical implementation of learning in many different areas of activity. In addition, the most important issues emerged when the development mobile learning technology applied. With the development of mobile learning in education, educational process is given extensive convenience in terms of access to learning resources through its mobile devices.

At present, perspectives on mobile learning generally divide in four categories (Sharples, 2006) . Firstly, mobile learning is technocentric, this perspective is about learning using cellular devices, such as cell phones, iPods, PDAs, and PlayStation Portable. Secondly, mobile learning is closely related to e-learning. This perspective characterizes mobile learning as a development of e-learning. Thirdly, mobile learning bridging formal education, formal education is often characterized as face-to-face learning. Lastly, learner-centered, concept of mobile learning was closely related to devices and the potential to improve learner-centered and lifelong learning (Sharples, 2000) . Based on those four perspectives, it can be stated that mobile learning closely related to learning by using handheld or cellular device which can be





a bridge for face to face and distance learning, therefore it provides potential to enable lifelong learning.

However, it became clear, instead of devices, the focus must be on student mobility. It means, based on student's perspective, mobile learning occurs when students are not in the specified location, or learning process occurs when students use cellular technology as a tool (Malley et al., 2005). Therefore, it can be highlighted, learner-centered in mobile learning requires students to be able to study independently by using cellular technology as a tool, both when students are in the classroom or outside the classroom.

In the development of mobile learning, not only mobile devices, but application or app also run as tools in mobile learning. In early 2008, app developed in the smartphones began to emerge in that year. The development of app on mobile phones was originally done by Apple which added functionality to the iPhone by creating HTML-based Web applications using JavaScript and CSS to provide interactivity (Crompton, 2013). Then, Apple announced that it would allow native applications designed for the iPhone. Furthermore, the Apple App Store began to be developed and integrated into the iTunes Store. Apple is actually very successful with the App Store which has around 400,000 applications to date. Furthermore, another smartphone Operating System (OS) has implemented a similar system, Google's Android OS, which appeared after the success of Apple's App Store (Godwin-jones, 2011).



Now, many applications are available on Android smartphones or iPhone which developed for educational goals. It started from the emersion of iLearn and PBS Kidz on App Store (Chiong & Shuler, 2015), and many others developed in order to make interactive learning using application (Clayton & Murphy, 2016b). This makes students and teachers easier to choose the most appropriate way to develop mobile learning at various education levels and subjects.

Mobile devices and application are one of factors in successful mobile learning implications. Briz-ponce & Juanez-Mendez found that through the use of mobile devices in the learning process, 69.95% of students had significantly better performance in cognitive achievement (as dependent variable) than those who do not use a mobile device (Briz-ponce & Juanez-Mendez, 2015). Another study found, the use of mobile learning, mobile application, or mobile devices for educational purposes also can improve student's mobile self-efficacy (Mahat, Fauzi, et al., 2012a). In line, the use of appropriate technology can also foster student engagement in the learning process (Matias & Wolf, 2015a).

1.2 Research Background

Mobile learning is not a new thing, but the use of mobile learning application is relatively new compared to another learning media. The study of mobile learning implementation in Indonesia has been studied several years ago in a number of science subjects and in various ages of students. For example, in the fields of



education and culture, children aged 4-10 years are taught about how to recognize and learn traditional clothing from all regions in Indonesia by using an Android-based educational game that is uploaded to the Google Play Store and can be used at various age levels (Agustina & Wahyudi, 2015). This showed that mobile learning application can be easily use at all ages because of the ease of ways to apply it in learning process .

In the middle school, mobile learning has also been applied in physics learning. Mobile learning is developed using a contextual learning approach or Contextual Teaching and Learning (CTL). Mobile learning is developed using multimedia supplementary sources that can be accessed through mobile devices (Zulham & Sulisworo, 2017) . Therefore, it is certainly a great potential which can be used to support learning in the classroom, especially using mobile devices as learning media.



Furthermore, at senior high school and vocational high school, mobile learning also applied in physics by using Moodle and Adobe Flash for supplementary sources. Moodle in mobile learning is supplementary sources in the form of software that can be accessed online through mobile devices. Moodle is an application program that can transform a learning media into a website (Setiawati et al., 2015) . Besides, Adobe Flash is a software which can support to make animations to help student understand easily (Astra et al., 2012). This showed that Moodle and Adobe Flash Animation are online platforms and software which can support mobile learning implementation, especially to make a supplementary resources and instructional media for learning.

For higher education in Indonesia, one of mobile learning implementation has been developed using the Android platform. Applications made not only for lecturers,



but also for students. This application has nine main features in mobile learning (for students and lecturers), namely the registration features, materials, assignments, quizzes, forums, grades, announcements, wikis, and lectures. These features are implemented into mobile learning in the form of application menus (Purnamasari et al., 2014).

To sum up, mobile learning in Indonesia has been developed and applied at every level of education and various subjects. This can be caused by two aspects. First, the high number of smartphone users and internet users in Indonesia (Koran Tempo, 2015), and also the use of Information and Communication Technology (ICT) which is currently a concern of the Indonesian government in the field of education, especially for higher education (OECD & ADB, 2015).

In fact, based on a survey conducted by e-Marketer, Indonesia is the seventh largest smartphone user in the world in 2014. It increased become the fourth largest in the world in 2016. Smartphone users has increased from 2014 to 2016. In 2014, smartphone users in Indonesia about 38.3 million. In 2015, it became 52.2 million users, then it increased again with a total of 69.4 million people and occupies the 4th position in the world in 2016 (Koran Tempo, 2015). This has implications in every field of life, especially on using smartphones in teaching and learning process.

In addition, Indonesia is a country with a consumptive population as internet users. The trend of internet user penetration is increasing by consecutive years. In 2016, a total of 132.7 million Indonesian were internet users. In 2017, from



Indonesia's total population of 262 million people, 54.68% or 143.26 million people were internet users (T. Lim, 2018).

When viewed based on the device used to access the internet in the character of the city/district located in the rural-urban area, 59.67% of internet users use a personal smartphone or tablet, 2.88% use a personal computer or laptop, 32.10% use both, and 5.35% use other devices. This demonstrates internet users in Indonesia prefer to use a personal smartphone or tablet to access internet, based on various interests and purposes of use (Asosiasi Penyedia Jasa Internet Indonesia, 2018; T. Lim, 2018).

The survey results based on their last level education of internet users in Indonesia, presented 88.24% of internet users experienced an upward trend, ranging from the category of users who did not go to school, users with elementary school education, users with junior high school education, senior high school, Bachelor, and Master and PhD. Users with Masters and PhD level of education were the biggest users with a percentage of 88.24%, followed by Bachelor 79.23%, and Senior High School 70.54%. This trend supports the implementation of mobile learning based on mobile devices in the form of smartphones both online and offline at undergraduate students with a minimum level of senior high school education (Asosiasi Penyedia Jasa Internet Indonesia, 2018).

Referring to several national surveys that have been carried out in Indonesia, the population of Indonesia is the 4th biggest smartphone user in the world (Asosiasi Penyedia Jasa Internet Indonesia, 2018). Moreover, internet user penetration through





smartphones is enormous than internet users through personal computers (PCs) and laptops (Asosiasi Penyedia Jasa Internet Indonesia, 2018) . The integration of the internet into smartphone usage has made it a crucial component, resulting in a continuous increase in the number of internet users over the years. The majority of internet users are at senior high school, Bachelor's, and Masters/PhD levels (Asosiasi Penyedia Jasa Internet Indonesia, 2018).

Integration of internet technology is one of the reasons Indonesian Government is concerned to perform the Information and Communication Technology (ICT) in educational process. Former Indonesian Minister of Research, Technology and Higher Education in Indonesia, Mohamad Nasir, emphasized learning system in higher education must be based on distance and online learning, which would reach all regions in Indonesia (Kemenristekdikti, 2018a).

After integrating technology in education, 21st century skills become next challenge in educational process in Indonesia. Today, the Ministry of Research, Technology and Higher Education (Kemenristekdikti) program, 21st century skills are one of the main focuses in education. 21st century skills consist of, 1) mastering information & communication technology literacy skills; 2) critical thinking skills; 3) problem-solving skills; 4) effective communication skills, and; 5) collaborate skills (Laar et al., 2017). According to the United Nations, those skills are the characteristic of knowledge-based society in global era (Chaeruman, 2010; Suarsana & Mahayukti, 2013).



Technology literacy skills are inseparable from 21st-century skills. This is extension of Ubiquitous Computing which was coined in the 90's by a researcher XEROX PARC who coined this term, ubiquitous computing is a condition that reflects the conditions of daily life that can never be separated from ICT (Weiser, 1991). Weiser forecast, small devices will be embedded making computing expand and become a reality (1991). Now, the extraordinary growth in hardware technology has fulfilled his vision at that time (Vinu et al., 2011). Besides, the development of hardware that has been replaced with software and applications in online learning, has been regulated in Regulation of the Ministry of Research, Technology, and Higher Education Number 51, 2018 concerning Online Learning in higher education in responding to the challenges of Disruption 4.0 and implementing 21st century skills in learning (Kemenristekdikti, 2019).

Online learning or digital learning according to the Ministry of Research, Technology, and higher education (Kemenristekdikti) is defined as flexible learning that utilizes ICT and can be accessed anytime, anywhere, and by anyone (Kemenristekdikti, 2019). This learning can be done in distance learning or F2F learning. As well, the spectrum of learning based on Information and Communication Technology (ICT) in higher education is divided into five categories, namely 1) face to face (F2F) learning; 2) blended/hybrid learning; 3) distributed learning; 4) teleconference; 5) e-learning. Figure 1.1 shows the components in each category in the spectrum of ICT-based learning in higher education by Kemenristekdikti (Kemenristekdikti, 2019).

According to Figure 1.1, mobile learning that will be applied in this research is mobile learning highlighted in red, it calls components in e-learning. Mobile learning according to Figure 8 can be applied to several learning categories, 1) distributed learning and 2) e-learning. Related to distributed learning that is belongs to distance education and fully online learning, this research is more precisely categorized in the learning process with e-learning. Mobile learning has indeed been widely developed for higher education, this study concentrates to develop mobile learning by developing applications (application) accessed by smartphones (iPhone and Android) as one of the learning materials.

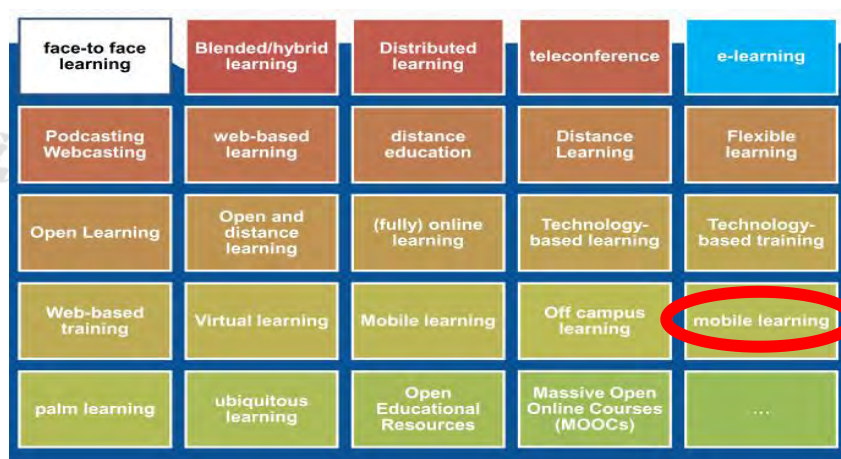


Figure 1.1. Spectrum of Mobile Learning in Higher Education in Indonesia, (Kemenristekdikti, 2019)

The advantages of using a smartphone in learning at higher education are, available for everyone, in the previous section it was explained that Indonesia is the 4th largest country as a smartphone user in the world (Koran Tempo, 2015). In the context of online learning, the significance of smartphones lies in their affordability compared to other handheld devices like PDAs and Notebook PCs. The sustained



lower cost of smartphones, coupled with competitive offerings from internet service providers for mobile devices, contributes to a gradual reduction in internet service prices that support smartphone operations. This trend proves to be more economical over time when contrasted with the rates for Short Messaging Service (SMS) or telephone calls. (Stott, 2007; Traxler & Wishart, 2011).

Compare with SMS or telephone call, internet service providers which offered in smartphone are affordable for users. Thus, smartphone users have been affecting generations, ranging from children, adolescents, adults, and the elderly, almost all generations know and use smartphones in everyday life for various purposes (Hutchison et al., 2012; Stockholm Unibersitetsbibliotek, 2017) . In the context of learning, the role of smartphones as a learning tool is facilitated due to their extensive coverage. This also holds true in Indonesia, where almost all regions are covered by internet networks, which serve as the primary support for using smartphones as a learning medium accessible anywhere and anytime. With wide coverage, smartphone networks can be utilized in almost all regions worldwide, especially in Indonesia (Yusri & Goodwin, 2013).

In educational purposes, smartphones give more benefits by using it as learning tools. As a learning tool, smartphone become devices that are usually always taken everywhere including when students follow the lesson (Gikas & Grant, 2013; Looi et al., 2009) . Formerly, carrying a smartphone during the lecture process is indeed prohibited if used in addition to the learning process (Fernandez, 2018; Johnson & Kritsonis, 2007), but the use of smartphones as learning tools to support the learning



process is certainly an exciting thing for students to be able to actively engage in learning.

In the same way, in terms of affective, readiness in accepting and using mobile learning is also one of the factors that influence the achievement of educational goals in higher education (Al-adwan et al., 2018; Chaka, 2017) . If students have readiness to use mobile learning application and are actively elaborated in learning process, it is expected educational goals can be reached (Al-mashhadani & Al-Rawe, 2018a).

In digital era, learning media has greatly influence the educational goals, among cognitive, affective, and psychomotor aspect to be achieved. Educational goals are not only always related to student learning outcomes or learning outputs. However, educational goals also include the learning process that should work so that the goals can be achieved (Adam, 2004). Mobile learning influenced several aspects of student during the learning process in class. Students are generally positive in using mobile devices for learning, which is important to be implemented in 21st century education (Vinu et al., 2011).

Mobile devices in mobile learning allows students to control their learning individually and makes it easier for students to change the learning context from formal to informal, in other words, from individual to social. The use of mobile devices in mobile learning facilitates interaction among students. This interaction not only makes learning more attentive and motivated but also allows teachers to understand that each student has different abilities. The use of mobile devices in the

context of mobile learning makes it easy for students to learn. Additionally, teachers also benefit from mobile learning, as it makes it easier for them to differentiate individual student needs and share resources among students (Dias, 2017a).

For students, mobile devices are easy to use and attractive. In this research, it can be more specific that mobile devices used is mobile learning application via smartphone usage. This device has a bigger screen, various applications, the use of software to record video and audio can also be done with mobile devices. Research on the use of mobile devices has a positive effect on student engagement in learning (Mango, 2015). In addition, students tend to spend more time learning attracts them. Other finding confirmed that mobile device can increase interest, creativity, enthusiasm, self-efficacy, engagement, motivation, independence, self-regulation, increased productivity in students, and learning process is more fun compare to the traditional learning (Morrone et al., 2012a).

Moreover, another finding by Yang (2012) showed that students have positive attitude and ability to use mobile devices in mobile learning easily and competently. In addition, the effects of self-efficacy in mobile learning, and positive student attitudes are also widely studied. Self-efficacy is a major factor influencing attitudes and behavior (Lee, 2009). Self-efficacy is related to an individual's willingness to always strive and be diligent to engage and participate in certain tasks (Usher & Pajares, 2008).

Saleem, Beaudry and Croteau define self-efficacy as an individual assessment of his ability to manage and take the actions needed to achieve predetermined targets

(Saleem et al., 2011). Previous studies have shown students attitudes and self-efficacy related to acceptance of information technology have become the main focus in educational research (Tsai & Tsai, 2010; Yang, 2012; Yorganci, 2017). Studies showed that students who have self-efficacy in high information technology, show more positive attitude towards information technology (Tsai & Tsai, 2010). Another study reported, students who have high mobile self-efficacy have the ability to be able to connect authentic material with the material being studied (Ayub et al., 2017). To conclude, self-efficacy and student attitudes are among the core factors that will determine the success of their engagement in mobile learning (Isman & Celikli, 2009a).

Student engagement in mobile learning is often studied in relation to learning outcomes. Study of the application of online learning platform revealed a positive relationship between student engagement with online learning resources for overall learning outcomes (Wong, 2013a). Engagement is influential and is important for academic competence, achievement, welfare and socialization of students and for effective learning (Coates, 2007; Li & Lerner, 2013a; Wang & Eccles, 2011a). It is impossible if learning is carried out without the involvement of students will produce positive results. So, it can be clearly seen that there is a positive influence between student involvement and learning outcomes or achievement (Fredricks & Mccolskey, 2018; Klein et al., 2005).

In the other words, engagement becomes essential in the learning process to produce student's performance, achievement or outcome (Gunuc, 2014a). To sum up, based on the theoretical rationale and empirical literature, this study focuses on how to develop mobile devices, in this case mobile applications (application) in mobile

learning environment and examine its impact on self-efficacy, student engagement and learning outcomes.

1.3 Problem Statement

Teachers has been emphasized in terms of improving the quality of education in accounting, interactive and innovative of teaching methods must be applied (Raluca, 2016). Teaching style and methods must be designed to achieve learning outcomes, therefore students are capable to handle real life accounting tasks in schools (as a teacher) and real business environments (as an accountant) (Handoyo & Anas, 2019).

In this era, mobile devices now a part of daily lives. In contrast, mobile learning is still rarely used in accounting education (Kemenristekdikti, 2018b). In fact, traditional learning (convention form of teaching and learning) was still applied in accounting at higher education. It involves lecture methods, boards, notes, textbooks and requires physical existence among educators and students. Researchers found, many teachers and educators taught using traditional learning in accounting education, specially, in introductory accounting course (Paz, 2017a; Srdar, 2017). In consequent, students to be lazy, disengage in class (Aquila et al., 2019), not achieving learning objectives (Srdar, 2017), and not enough to equip students with a dynamic working market in accounting (Becker, 2013).

Contrary, although rapid improvement of mobile technology devices has made in present day, it has not been commonly used in accounting education. Mobile



devices and application for teaching and learning (called, mobile learning application) should be able to make a new transformation in the function and structure of knowledge in accounting education. Whereas, mobile devices and application have indeed been widely studied, developed, and applied in various subject, but there is still little innovation for accounting (Apostolou et al., 2016) . Accounting students have become technologically knowledgeable, and the educators should be encouraged to pursue trying to extend conventional borders (Paz, 2017a).

In fact, various empirical evidence gathered from a literature review in accounting education done by Apostolou, Domine, Hassel and Rebele, and also literature research on google play store, mobile learning application in the field of Accounting, especially for the Introductory Accounting Course still little developed (Apostolou et al., 2016). Based on literature research at google play store, as depicted in Figure 1.2, four hundred and thirty-five (435) applications which developed in accounting subject (accounting in general). 57.5% of all application is used for educational context, and 42.3% application used for non-educational context. This showed that although mobile learning application have been established for accounting purposes, there are only a few which discuss more specific material, such as Introductory Accounting Course.

In addition, accounting application which have been released in Google Play Store does not clearly provide a demographic description related to the user's age (Huoy, 2015) , only a few applications explain the level of academic study for application users. Thus, more application in accounting were used for education, but



still left a problem, the absence of application specifically designed for learning on topic of adjusting entries.

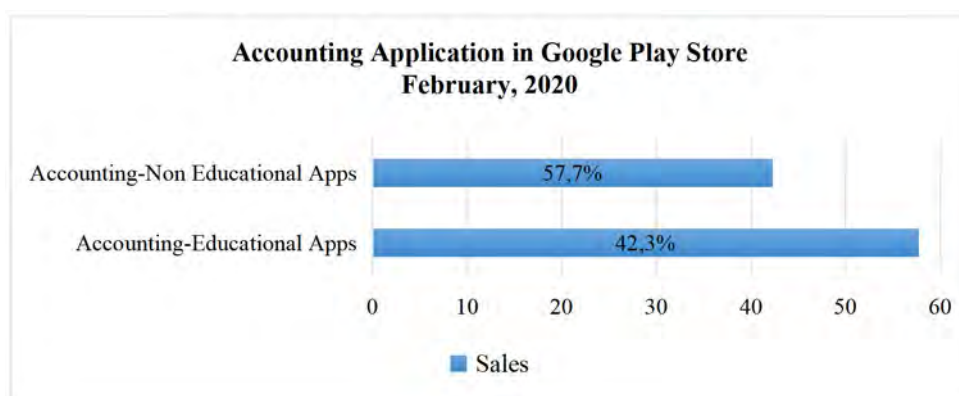


Figure 1.2. Accounting Application in Google Play Store, February 2020. Source: Google Play Store

Adjusting Entries is essential part to prepare financial statements. In reality, based on previous studies, student has the difficulty, and less capable to understand learning material, especially in adjusting entries (Almujab et al., 2018; Phillips & Schmidt, 2010; Sari, 2015). Even though, a study in adjusting entries has discovered and developed by (Denis, 2014), “Systems and Methods for Providing Computer-Automated Adjusting Entries”. However, its utility is constrained by its exclusive operability on computers, limiting its integration into the increasingly mobile-centric learning environments. This gap underscores the necessity for developing MLA for accounting education, particularly for the complex topic of adjusting entries. An MLA would not only address the flexibility and accessibility limitations of Denis's system but also align with the evolving educational needs, offering a more interactive and engaging learning experience in accounting.

In 2020, another problem found when the spread of Covid-19 in the territory of Indonesia in June 2020 has not shown any signs of decreasing. Instead, the infected trend is increasing, prompting the Indonesian Ministry of Education and Culture to take steps to prevent transmission in the educational environment, namely by making a Joint Decree of 4 Ministers which agrees that learning process especially in higher education in the odd semester of academic year 2020/2021 in all zones, must be held online for theoretical courses (Indonesian Ministry of Higher Education and Culture, 2020) . Meanwhile, practical courses should be conducted online wherever possible (Indonesian Ministry of Education and Culture, 2020).

The advent of the COVID-19 pandemic has dramatically altered the educational landscape, presenting significant challenges for both educators and learners. A critical issue identified in this research is the enforced transition to online learning platforms, a move that has fundamentally affected the dynamics of student engagement and interaction. While online learning offers continuity in education during such unprecedented times, it has inadvertently led to a notable decrease in effective student interaction during lessons. This reduction in interaction is not merely a technological issue but extends to the core of learning methodologies, affecting student engagement and participation. The change from a traditional classroom setting to an online environment, where personal interaction is minimized, has resulted in a decline in active participation in learning activities, a factor crucial for academic success, especially in subjects that require high levels of engagement like accounting.

Another significant concern highlighted in this research pertains to the technological platforms predominantly used by students during the pandemic. The on



platforms like Zoom and various Learning Management Systems (LMS), which are primarily accessed through laptops, has led to an unexpected consequence: diminished mobile self-efficacy among students in the context of Mobile Learning Applications (MLA) for accounting education. This issue is compounded by the fact that the use of MLAs in accounting education is still not widespread, particularly those that are smartphone-accessible. The limited exposure and utilization of MLAs in accounting signify a gap in the educational tools available to students, restricting their learning flexibility and adaptability in a rapidly evolving digital landscape. This gap is particularly concerning, given the growing importance of mobile learning in today's digital-centric educational environment.

Adjusting entries is more theoretical courses, it can be taught using teaching materials in digital form combined with other teaching materials in various forms, formats, media and sources. Teaching materials are generally divided into two, namely printed and non-printed teaching materials. During COVID-19 pandemic, non-printed teaching materials are more appropriate for online and mobile learning (Indonesian Ministry of Higher Education and Culture, 2020) . One of them is by using an application which can be accessed by using smartphones easily. Mobile learning application is unavoidable option throughout COVID-19 pandemic (Naciri et al., 2020).

To sum up, based on problem identification, and formulation of research objectives, the focus of the research topic to be examined is "The Development of Accounting Mobile Learning Application Toward Enhancement of Cognitive



Learning Outcome, Engagement and Mobile Self-Efficacy Among University Students in Indonesia”.

1.4 Purpose of The Study

The main goal of this research is twofold. To begin, the focus should shift away from addressing the highlighted problem of a lack of effective mobile learning applications for accounting education, particularly in the realm of adjusting entries, and toward an assessment of user expectations and requirements. Second, the research will look into how the built mobile learning application affects cognitive learning results, mobile self-efficacy, and student engagement. In essence, the purpose of this study is to align the development of the mobile learning application with the articulated needs and preferences of users, thereby contributing to the improvement of learning outcomes, engagement, and mobile self-efficacy in accounting education through the creation and evaluation of an innovative mobile learning application.

1.5 The Objectives of the Study

The research objectives of this study are as follows:

1. To identify the requirements and preferences of students and teachers for a mobile learning application specifically designed for the topic of adjusting entries in accounting education.

- 2.To design and develop a mobile learning application that is specifically designed for the topic of adjusting entries in accounting education.
- 3.To evaluate the feasibility of the mobile learning application in adjusting entries through feasibility and usability testing.
- 4.To investigate the effect of the mobile learning application on cognitive learning outcomes related to the topic of adjusting entries.
- 5.To investigate the effect of the mobile learning application on student engagement in learning the topic of adjusting entries.
- 6.To investigate the effect of the mobile learning application on students' mobile self-efficacy in learning the topic of adjusting entries.
- 7.To investigate the simultaneous effects of the mobile learning application on cognitive learning outcomes, student engagement, and mobile self-efficacy for students learning the topic of adjusting entries.

Overall, the objectives of this study aim to support the development of an effective and engaging mobile learning application for accounting education while also exploring the impact of such technology on key student learning outcomes, engagement, and mobile self-efficacy.

1.6 Research Question

Based on the research objectives to be achieved, the research questions can be explained in the following Table 1.1.

Table 1.1
Research Objectives and Research Questions

Research Objectives		Research Questions	
1.	Identify student's and teacher's requirement of mobile learning application in adjusting entries.	1	What are the students and lecturer's requirement of mobile learning application in adjusting entries?
2.	Designing and developing mobile learning application in adjusting entries.	2	How to design and develop mobile learning application in adjusting entries?
3.	Assess the feasibility of mobile learning application in adjusting entries.	3	Is mobile learning application feasible for learning material in adjusting entries?
4.	Investigate the effect of mobile learning application in adjusting entries on cognitive learning outcomes.	4	a. Is there significant difference between the mean cognitive learning outcome scores in the pretest between control group and the experimental group? b. Is there significant difference between the mean cognitive learning outcome scores at the posttest between control group and the experimental group? c. Is there significant difference between the mean cognitive learning outcome scores at the pretest and the posttest of the control group? d. Is there significant difference between the mean cognitive learning outcome scores at the pretest and the posttest of the experimental group?
5.	Investigate the effect of mobile learning application in adjusting entries on student engagement.	5	Is mobile learning application in adjusting entries can enhance student engagement?
6.	Investigate the effect of mobile learning application in adjusting entries on mobile self-efficacy.	6	Is mobile learning application in adjusting entries can enhance mobile self-efficacy?
7.	Investigate the effect of mobile learning application in adjusting entries on cognitive learning outcomes, student engagement, and mobile self-efficacy simultaneously.	7	Is mobile learning application in adjusting entries can enhance cognitive learning outcome, student engagement, and mobile self-efficacy simultaneously?

Table 1.1 (continue)

(continue)



1.7 Research Hypotheses

This study examines the effect of mobile learning application using the pretest-posttest control group design experimental research design. The experimental group was the group that was given treatment, and the control group was the group that was not given treatment. The following hypotheses are arranged based on problem statements, research objectives, and research questions in this study, which are described as follows.

H₁: There is significant difference between the mean cognitive learning outcome scores at the pretest between control group and experimental group.

H₂: There is significant difference between the mean cognitive learning outcome scores at the posttest between control group and experimental group

H₃: There is significant difference between the mean cognitive learning outcome score at pretest and posttest in control group

H₄: There is significant difference between the mean cognitive learning outcome scores at pretest and posttest in experimental group

H₅: There is significant difference between the mean student engagement scores at pretest and posttest in experimental group

H₆: There is significant difference between the mean mobile self-efficacy scores at pretest and posttest in experimental group



H₇: There is significant difference between the mean cognitive learning outcome scores, student engagement and mobile self-efficacy at pretest and posttest in experimental group.

Based on the hypothesis above, the supporting theories are listed in the Table 1.2.

Table 1.2

Theoretical Frameworks Underpinning Hypotheses Formulation

Previous findings	Author & year	Hypotheses
MLA can enhance student learning outcome.	A. C. Camilleri & Camilleri (2019) M. A. Camilleri & Camilleri (2017) Ciampa (2014) Hwang & Wu (2012a) Al-adwan et al., (2018b) Chaka (2017b) Al-mashhadani & Al-Rawe, (2018b) Sánchez & Isaias (2018) Demir & Akpınar (2018a) Georgieva et al., (2011a) Pedro et al., (2018) Dias (2017b) Hashim et al., (2015) Hussin et al., (2012a) Tabor (2016a)	H ₁ , H ₂ , H ₃ , H ₄
Engagement can increase student learning outcome	Gunuc (2014b) Jabbour (2014a) L. Taylor & Parsons (2011) West (2013a) Coates (2007) Li & Lerner (2013b) M. Wang & Eccles, (2011b) J. Fredricks et al., (2011) Klein et al., (2005b)	H ₅
Self-efficacy can foster student learning outcome.	Bandura (1977a) Menekse et al., (2018a) Pajares & Schunk (2001a)	H ₆



In this study, the hypotheses are informed by various theories (refer to Table 1.4), with some serving as foundational principles, such as Bandura's Theory on self-efficacy, which constitutes a primary theoretical framework. Additionally, supporting theories underpin the formulation of H_1 to H_7 , as outlined in Table 1.4. Notably, previous research findings from authors like Camilleri & Camilleri (2019), Ciampa (2014), Hwang & Wu (2012), and others contribute to the establishment of H_1 to H_4 , emphasizing the potential enhancement of student learning outcomes through the utilization of Mobile Learning Applications (MLA). Furthermore, engagement's positive impact on learning outcomes, substantiated by Gunuc (2014), Taylor & Parsons (2011), and others, forms the basis for H_5 . Finally, the relationship between self-efficacy and student learning outcomes is grounded in Bandura's seminal work (1977b), as well as support from Menekse et al. (2018) and Pajares & Schunk (2001),

1.8 Conceptual Framework of Research

The research is focused on developing a Mobile Learning Application (MLA) to help students overcome problems they have in the Introductory Accounting Course at a Muhammadiyah University in Indonesia. The study suggests adopting a computerized education strategy using smartphone applications to address the growing complexity of computerized accounting operations. The study employs a Design and Development Research (DDR) methodology, which consists of three main parts.



The first stage, known as Need Analysis, is conducting surveys to gain insight into the preferences and difficulties encountered by students and lecturers, with a special emphasis on the understanding and practical application of changing entries in the course. The ensuing Design and Development process converts the stated demands into the construction of MLA. This application is subjected to expert validation (feasibility testing) and usability testing, which is based on student feedback. This process ensures that the program is both effective for educational purposes and user-friendly. The final step of this phase entails conducting feasibility testing to determine the MLA's preparedness for incorporation into the academic environment.

During the final Evaluation phase, a quasi-experimental research approach is used to measure the effect of the MLA on cognitive learning outcomes, student engagement, and mobile self-efficacy. The conceptual framework aims to address the technological difficulties in accounting education, with a focus on practical implementation and the ability to enhance the entire learning experience for students in the Introductory Accounting Course. Overall, Figure 1.3 serves as a comprehensive visual representation of the research's structure and methodology.



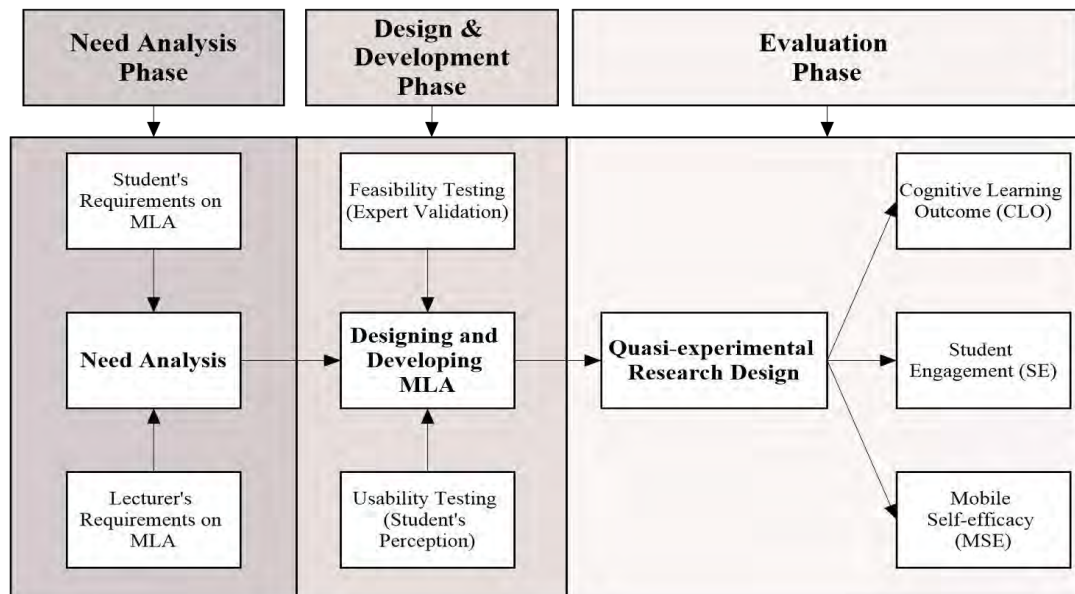


Figure 1.3. Conceptual Framework

1.9 Operational Definition

1.9.1 Mobile learning application

Mobile learning applications refer to software programs that are designed and installed on mobile devices, such as smartphones or tablets, for the purpose of facilitating learning. These applications can take various forms, including games, simulations, interactive quizzes, and multimedia materials, among others. The primary advantage of mobile learning applications is that they offer learners the ability to access educational content anytime and anywhere, thereby providing greater flexibility and convenience. The use of games in mobile learning applications has become increasingly popular, as they can provide an engaging and interactive learning experience for learners of all ages. By incorporating mobile learning applications into the learning process, educators can enhance the educational experience for students and promote active and personalized learning (Mansour, 2016).



1.9.2 Adjusting Entries

Adjusting entries are defined as journal entries made at the end of an accounting period to allocate income and expenses to the period in which they actually apply, as opposed to the period in which they were recorded. These entries are necessary because the transaction may have occurred on a different date than the one required to satisfy the matching principle in accrual-based accounting. The purpose of adjusting entries is to ensure that the financial statements accurately reflect the financial position of the company and its financial performance during the period under review. Typically, adjusting entries involve one account on the income statement and one account on the balance sheet, and they are used to correct errors, update asset or liability balances, and recognize revenue or expenses that were previously unrecorded (Needles et al., 2014; Weygandt et al., 2015a).



1.9.3 Learning Outcome

Cognitive learning outcomes are defined as the measurable changes in a student's knowledge, skills, and abilities that occur as a result of their engagement in academic activities. This definition primarily focuses on two key components: (1) academic performance, which refers to the level of achievement demonstrated by students in relation to specific academic goals or standards, and (2) cognitive test scores, which are standardized measures used to assess student knowledge and skills in specific subject areas. Cognitive learning outcomes can be evaluated using a variety of assessment tools, such as tests, quizzes, assignments, and projects, and are an



essential component of evaluating the effectiveness of educational programs and instructional strategies (Yu & Liqiu, 2019).

1.9.4 Student Engagement

Student engagement in mobile learning can be defined as a multi-dimensional construct that encompasses various aspects, including intrinsic involvement in learning, active participation in educational activities, and the quality of interactions between students and their peers or instructors. It can be measured through various indicators, such as self-reported measures of engagement, frequency of participation in online discussions or assignments, and quality of academic performance. Student engagement in mobile learning is considered a key educational process that can significantly influence students' academic achievement and overall learning experience. Additionally, it reflects the quality of the university in terms of its ability to create a supportive and stimulating learning environment. Finally, student engagement can also serve as a meaningful way to measure the effectiveness of educational interventions and to identify areas for improvement (Coates, 2006; Fredricks & Mccolskey, 2018).

1.9.5 Self-efficacy

Self-efficacy is students' beliefs about their ability to complete their academic assignments (Bandura, 1989; Perry & Steck, 2016; Rowan-kenyon et al., 2012). Self-

efficacy in this study refers to students' perceived ability to effectively integrate and use mobile learning applications in their learning activities. Specifically, the construct of mobile self-efficacy that will be measured in this research includes seven dimensions: 1) encouragement by others, which refers to the extent to which students perceive support and encouragement from their peers or instructors to use mobile learning applications; 2) other's use, which refers to the extent to which students perceive that others are successfully using mobile learning applications; 3) support, which refers to the perceived level of technical and pedagogical support available for the use of mobile learning applications; 4) outcome expectations, which refers to the perceived benefits and usefulness of using mobile learning applications for achieving academic goals; 5) affect, which refers to the emotional reactions and attitudes towards using mobile learning applications; 6) anxiety, which refers to the perceived level of discomfort or anxiety when using mobile learning applications; and 7) usage, which refers to the actual frequency and extent of using mobile learning applications for learning purposes (Higgins, 1995; Mahat, Fauzi, et al., 2012b; Park et al., 2011).

1.10 Significance of the Study

Mobile learning application that will be developed as learning media in the introductory accounting course are expected to provide benefits for:

1. Organizations

Universitas Muhammadiyah Surakarta (UMS), Indonesia is an organization that will benefit directly from the development of mobile learning application, especially in the implementation of ICT-based learning tool. It is one of the

characteristics of educational development in the disruption era 4.0, where learning can be accessed without limits (Shuler & Ed, 2009), technology for all fields of learning (Looi et al., 2009). Application for introductory accounting course will be applied in the accounting education department and then disseminated to other higher education institutions which have the same subjects.

2. Communities

Mobile learning application for introductory accounting courses is expected to have a positive impact on the development of learning media and supplementary resources in the Accounting Education Study Program as a whole, especially for universities which are members of the Association of Indonesian Accounting Education Study Programs (APRODIKSI).

3. Countries

Mobile learning application for learning media and supplementary resources on the Introductory Accounting Course can certainly be used by all students both at High School, vocational High School, higher education Students who get this material. In Indonesia, literature and references (reading material) that are widely used are still in the form of printed books and e-books. The development of learning media based on android smartphone application on the Introductory Accounting material is still not widely found in Indonesia (Kemenristekdikti, 2018b).

This will contribute and have a positive impact on the development of instructional media, which is mostly owned by high school students and higher education students. This media has become a new, interesting and easily accessible learning tool anywhere and anytime, both during class and outside the

classroom, especially in Indonesia. It is easy for millennials to take part in learning, because the internet is one of the fastest growing ICT media compared to cellphones, TVs, cable phones and faxes. (M. A. Camilleri & Camilleri, 2017; Na'im, 2016; So, 2012).

4. Body of Knowledge

The findings of this study are also expected to provide benefits for the development of social science and technology in the field of education. This is especially for study programs in Accounting Education, Accounting, Education, and other fields that can use mobile learning application for learning purposes. Various limitations in this research are expected to be the basis for further development of learning media both in the Adjusting Entries material or in other material.

5. Student

With the support of this research, it is expected that students will be able to absorb course content more effectively and comprehensively. Students can also benefit from technology when it comes to learning because students can access learning materials whenever and wherever they choose. Varied research restrictions are intended to serve as the basis for the construction of new instructional tool, including adjusting entries material and other resources.

1.11 Chapter Summary

Chapter 1 of this research gives a complete overview of the use of mobile learning applications in accounting education, with an emphasis on basic accounting courses.



It stresses the recognized need in existing research, namely a lack of learning applications geared to the difficult topic of adjusting entries in accounting education. Many students at Indonesian higher education institutes find this topic tough. The chapter emphasizes the importance of bridging this gap by seeking to create a mobile learning application tailored for beginning accounting classes. The rationale for this study comes from the recognized limits of traditional learning approaches, which result in inadequate learning outcomes and insufficient engagement among students.

Furthermore, the chapter offers light on the current situation of university facilities and infrastructure, emphasizing students' growing reliance on smartphones to assist their educational activities. The research's overarching purpose is to create a mobile learning application that has been shown in prior studies to improve student cognitive learning outcomes, engagement, and mobile self-efficacy. The first chapter's summary captures the study's motivation, context, and aims, placing it within the larger landscape of educational issues and technology improvements.

