

**FACTORS INFLUENCING MOBILE ASSISTED
ENGLISH LEARNING AMONG MALAYSIAN
UNDERGRADUATES: THE MEDIATING ROLE
OF SELF-REGULATED LEARNING**

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by

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LIST OF ABBREVIATIONS

CA	Cronbach Alpha
CFA	Confirmatory Factor Analysis
CR	Composite Reliability
EE	Effort Expectancy
EFA	Exploratory Factor Analysis
HTMT	Heterotrait-Monotrait
FR	Facilitating Resources
MAEL	Mobile Assisted English Learning
MGA	Multi-Group Analysis
MICOM	Measurement Invariance of Composite Models
MSE	Mobile Self-Efficacy
PE	Performance Expectancy
PLS-SEM	Partial Least Square - Structural Equation Modelling
SI	Social Influence
SRL	Self-Regulated Learning
SCT	Social Cognitive Theory
UTAUT	Unified Theory of Acceptance and Use of Technology
VIF	Variance Inflation Factor

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**FAKTOR YANG MEMPENGARUHI PEMBELAJARAN BAHASA
INGGERIS MUDAH ALIH DALAM KALANGAN MAHASISWA
MALAYSIA: PERANAN PEMBELAJARAN ATURAN KENDIRI
SEBAGAI PENGANTARA**

ABSTRAK

Pemilikan dan penggunaan peranti mudah alih yang meluas dalam kalangan mahasiswa Malaysia diharapkan mampu dimanfaatkan untuk mempelajari bahasa Inggeris secara sendiri, sejajar dengan hasrat kerajaan untuk melahirkan pelajar bahasa Inggeris yang autonomi. Walau bagaimanapun, motivasi di sebalik pembelajaran bahasa Inggeris mudah alih tidak jelas kerana kajian yang terhad dalam bidang ini. Untuk mengatasi jurang tersebut, kajian ini mengintegrasikan Teori Bersepadu Penerimaan dan Penggunaan Teknologi (UTAUT) dan Teori Kognitif Sosial (SCT) untuk menyiasat faktor yang mempengaruhi pembelajaran bahasa Inggeris mudah alih dalam kalangan mahasiswa Malaysia. Lebih khusus lagi, berdasarkan kerangka teori bersepadu tersebut, faktor dalaman (jangkaan prestasi, jangkaan usaha, dan efikasi sendiri mobil) dan luaran (pengaruh sosial dan kemudahan sumber) dicadangkan mempengaruhi keputusan pelajar untuk menggunakan peranti mudah alih untuk pembelajaran bahasa Inggeris melalui kesan pengantaraan pembelajaran aturan sendiri. Kaedah tinjauan keratan rentas digunakan untuk mengumpul data melalui soal selidik berasaskan Google secara dalam talian di mana sejumlah 400 mahasiswa yang mengamalkan pembelajaran bahasa Inggeris mudah alih dipilih melalui kaedah persampelan bertujuan dari lima universiti awam di Malaysia. Data yang diperoleh dianalisis menggunakan Kaedah Kuasa Dua Terkecil Separa – Permodelan Persamaan Berstruktur (PLS-SEM), melalui perisian

SmartPLS versi 3.3.3. Dapatan kajian menunjukkan: (1) model pengukuran memiliki nilai kebolehpercayaan dan kesahan yang mencukupi, (2) tujuh dari 11 hipotesis untuk hubungan langsung adalah disokong dalam model struktur, (3) tiga dari lima hipotesis untuk hubungan tidak langsung adalah disokong dalam analisis pengantaraan, dan (4) hanya pengaruh jangkaan usaha terhadap pembelajaran bahasa Inggeris mudah alih mempunyai perbezaan yang signifikan berdasarkan jantina. Oleh itu, dapatan ini telah menjawab persoalan kajian: (1) jangkaan prestasi, efikasi sendiri mobil dan kemudahan sumber adalah faktor dalaman dan luaran yang mempengaruhi pembelajaran bahasa Inggeris mudah alih (2) pembelajaran aturan sendiri mempengaruhi pembelajaran bahasa Inggeris mudah alih (3) jangkaan prestasi, efikasi sendiri mobil dan pengaruh sosial adalah faktor dalaman dan luaran yang mempengaruhi pembelajaran aturan sendiri, (4) pembelajaran aturan sendiri mengantara hubungan antara jangkaan prestasi, efikasi sendiri mobil, pengaruh sosial, dan pembelajaran bahasa Inggeris mudah alih, dan (5) hanya pengaruh jangkaan usaha terhadap pembelajaran bahasa Inggeris mudah alih yang berbeza antara lelaki dan wanita. Dapatan kajian ini yang meneliti hubungan antara konstruk yang dicadangkan menunjukkan bahawa model penyelidikan yang dibangunkan sesuai untuk menjelaskan pembelajaran bahasa Inggeris mudah alih dalam kalangan mahasiswa Malaysia.

**FACTORS INFLUENCING MOBILE ASSISTED ENGLISH
LEARNING AMONG MALAYSIAN UNDERGRADUATES: THE
MEDIATING ROLE OF SELF-REGULATED LEARNING**

ABSTRACT

The widespread ownership and use of mobile devices among Malaysian undergraduates is expected to enable them to self-direct their English learning, which is in line with the government's aspiration to produce autonomous English learners. However, the motivations behind their mobile assisted English learning (MAEL) are unclear due to limited studies in this area. Thus, addressing the gap, this study integrated the Unified Theory of Acceptance and Use of Technology (UTAUT) and Social Cognitive Theory (SCT) to investigate the factors that influence such MAEL behaviour. More specifically, through the integrated theoretical framework, the internal factors (i.e., performance expectancy, effort expectancy, and mobile self-efficacy) and external factors (i.e., social influence and facilitating resources) were proposed to influence Malaysian undergraduates' MAEL use decisions through the mediating effect of self-regulated learning (SRL). Data were collected by employing a cross-sectional survey using an online Google-based questionnaire in which a number of 400 Malaysian ESL undergraduates identified to practise MAEL were purposively sampled from five public universities in Malaysia. The elicited data were analysed using the partial Least Square- Structural Equation Modelling (PLS-SEM) analysis via the SmartPLS version 3.3.3 software. Findings indicate: (1) the measurement model appeared to have sufficient reliability and validity values, (2) seven out of 11 directional alternative hypotheses for the direct relationships were supported in the structural model, (3) three out of five alternative hypotheses for the

indirect relationships were supported in the mediation analysis, and (4) there was only a significant difference on the effect of effort expectancy on MAEL between male and female undergraduates. Thus, the findings have answered research questions: (1) performance expectancy, mobile self-efficacy and facilitating resources are the internal and external factors that influence MAEL, (2) SRL influences MAEL, (3) performance expectancy, mobile self-efficacy and social influence are the internal and external factors that influence SRL, (4) SRL mediates the effect of performance expectancy, mobile self-efficacy, and social influence on MAEL, and (5) only the influence of effort expectancy on MAEL differs between males and females. Based on these findings, examining the relations of the proposed constructs shows that the developed research model is appropriate to explain MAEL behaviour among Malaysian ESL undergraduates.

CHAPTER 1

INTRODUCTION

1.1 Introduction

The proliferation of information and communication technology (ICT) has facilitated various learner-centred pedagogical approaches, encouraging learners to take an active role in knowledge construction (Ng, 2015). This phenomenon is particularly prevalent in the higher learning setting as there has been a great interest in blending electronic learning (e-learning) with classroom-based activities (Amrien Hamila Ma'arop & Mohamed Amin Embi, 2016; Kear, 2011). In the Malaysian context also, the integration of ICT into conventional tertiary classrooms is mainly to encourage students in becoming an independent learner outside the classroom (Johan Eddy Luaran et al., 2014). More recently, in facing the global fourth industrial revolution, the government has launched the Education 4.0 framework which underlines the shifts of major learning responsibilities from instructors to learners through programs like e-learning, blended learning, and Massive Open Online Courses (MOOCs).

'Mobile', 'portable', 'handheld', and 'wirelessly networked'; these are some of the main highlights of mobile technologies that have contributed to their rapid proliferation in the higher education setting (Issham Ismail et al., 2016; Traxler, 2009). In comparison to e-learning that commonly requires computer and internet access, the pervasiveness of mobile technologies has enabled e-learning that uses mobile devices and wireless communication. Consequently, learning has become much more beneficial and accessible as it could happen regardless of the time and place (Munir Shuib et al., 2015). This also demonstrates the potential of such

sophisticated technologies in promoting learning that is not only student-centred, personal and ubiquitous, but also independent (Sha et al., 2012).

Having learned the advancement of mobile devices has had its place within the sphere of education, the question of to what extent it is harnessed in maximising the impact of teaching and learning, however, is yet to be clearly answered. To illustrate, while the role of technology in fostering and nurturing learner autonomy has been widely highlighted in recent years (Kalyaniwala & Ciekanski, 2021), there is a gap in the literature explaining learners' self-initiated practice using technology (Naveh & Shelef, 2020; Olofsson et al., 2018; Selwyn, 2010). This includes research in the area of mobile language learning (Demouy et al., 2016), in which the scarcity is also observable in the Malaysian context (Ganapathy et al., 2016; Ratnawati Mohd Asraf & Nadya Supian, 2017). As the researchers suggested, future research should seek to address students' use of not only institution-based technology but also technology that they choose by themselves.

Such enlightenment is crucial for successful language learning is highly associated with language learners' ability to self-initiate and self-direct their learning by taking advantage of various digital language learning resources in the non-formal learning environments (Lai & Gu, 2011; Nunan & Richards, 2014; Richards, 2015). Of such encouragement, in general, the current research undertaken discusses the link between mobile technology advancement and independent language learning within the scope of Malaysian undergraduate ESL (English as a second language) learning.

1.2 Background of the Study

ICT integration in language teaching and learning has been acknowledged to not only enhance language instruction inside the classroom but also extending it beyond the setting, encouraging learners to take control over their learning experiences (Brown, 1991; Khezrlou & Sadeghi, 2012; Lai & Gu, 2011; McLoughlin & Lee, 2010). In recent years also, the phenomenal proliferation of mobile devices in language teaching and learning has led to the further development and rapid adoption of mobile-assisted language learning (MALL) (Mindog, 2016; Sun & Gao, 2020). MALL promotes a new way of learning that exploits personal and portable devices, allowing “continuity or spontaneity of access across different contexts of use” (Kukulska-Hulme & Shields, 2008, p.273). To illustrate, access to learning resources increases on mobile devices for language learners as they are readily downloadable and accessible on the go (Kukulska-Hulme, 2009). Learning has also reportedly become more productive (Zhang et al., 2011) which is exceptionally relevant to L2 (i.e., ESL and EFL [English as a foreign language]) learners as they would have more chances to practise English ‘anywhere’ and at ‘anytime’.

Besides, since class time is very limited for proactive learning to happen, it is important for L2 learners to make use of the learning opportunities and resources available beyond the class setting (Sert & Boynuegri, 2017). These time limitation and availability of open resources are in fact some of the strong reasons as to why independent use of mobile devices for language learning need to be practised among L2 learners (Sert & Boynuegri, 2017). Malaysian ESL learners at the tertiary level of education have also been reported to experience such limited practice time during class hours (Nooreiny Maarof & Indira Malani, 2015) as English instruction in most

Malaysian higher education institutes, particularly for non-English courses, is only six hours per week (Noriah Ismail et al., 2012; Noriah Ismail et al., 2013). The challenge in limited instruction time, as well as limited exposure to the language, demand L2 learners' extra effort to learn it autonomously outside of class time (Ahn, 2018; Mindog, 2016). Accordingly, the Malaysian government has highlighted the application of autonomous English learning using modern technology in its Education Blueprint (MEB 2015-2025) (Sidhu et al., 2017).

Consequently, Malaysian ESL undergraduates are anticipated to be able to use various strategies for improving their English including by capitalising the ever-developing digital learning environment like mobile learning. The widespread ownership and use of mobile devices among Malaysian undergraduates also indicate the potential of mobile technologies in increasing educational opportunities for this group of students (Arokiasamy, 2017, Crompton & Burke, 2018). Correspondingly, the educational potentials of technology are only fully capitalised when it is actively and effectively used by the learners themselves, both inside and outside of the classroom (Corrin et al., 2010; Lai et al., 2012). Thus, this ultimately suggests the importance of the exploration into Malaysian ESL undergraduates' mobile assisted English learning (MAEL) behaviour, particularly in a non-formal learning context. While MALL is a more general term, MAEL in the present study refers specifically to independent English language learning via utilisation of mobile devices. In the context of this study where the scope is on ESL, the use of the term MAEL is preferred as the term MALL may make readers think of its wide range of mobile assisted language learning.

Of the limited studies exploring Malaysian ESL learners' independent MAEL practices, finding word meanings and translating words or phrases were reportedly the most frequent and preferred activities (Anum Ariffah Mustapha & Siti Anisah Mohd Hatta, 2018; Chan & Ang, 2017; Harwati Hashim, Melor et al., 2018; Ratnawati Mohd Asraf & Nadya Supian, 2017). Other uses reported include speaking and pronunciation practice (Ratnawati Mohd Asraf & Nadya Supian, 2017), as well as communicating with friends through social networking platforms (Chan & Ang, 2017). Besides, many Malaysian ESL undergraduates stated that, although they did access online platforms like Facebook, email, and online test/quizzes/practices on their mobile devices to learn English, their regular usage of the platforms was mainly for recreational purposes (K. W. Lee et al., 2014; Shahnil Asmar Saaid & Zaliffah Abd Wahab, 2014; Thang et al., 2014; Thang et al., 2016). In the same vein, the findings of Shahnil Asmar Sanid and Zaliffah Abd Wahab (2014) revealed Malaysian undergraduates' preference to read digital-based materials using their laptop to using mobile devices like smartphone or tablet.

Based on the findings of the above-mentioned studies, it could be seen that there are variations in Malaysian ESL learners' independent use of mobile devices for English learning as manifested in the frequency and type of MAEL activities. Considering the positive association between out-of-class mobile devices use and language learning, such variations bring about uncertainties as to which factors influence how Malaysian ESL undergraduates utilise mobile technology for English learning beyond classroom. This is because, in a voluntary use context especially, technology adoption and use mostly depends on whether learners as the users believe that particular technology fits their individual needs (Mac Callum & Jeffrey, 2013)

and helps to achieve their educational goals (Karimi, 2016). Learners can have very different perceptions about and knowledge of mobile technology and for this reason, it is important to consider the influencing factors from their point of view (Mac Callum, 2011).

To date, numerous studies have examined the factors of technology adoption and use by extending existing models of technology adoption. As a result, the influences of factors on user behaviour have been reported at different levels, including the individual, technology (e.g., the user interface), organisation, and environment (Kukafka et al., 2003; Salahshour Rad et al., 2018; Tarhini et al., 2017). Consequently, different categorisations have emerged when stating the key factors for each level, such as attitude and beliefs at the individual level and technological resources and cultural influences at the environmental level (Kukafka et al., 2003). Due to the various categories, some related studies have also classified the factors into internal and external factors as purported by prominent technology adoption models like Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT) (Davis et al., 1989; Venkatesh et al., 2008). Moreover, as Social Cognitive Theory (SCT) posits, an individual's behaviour is determined by personal, behavioural, and environmental factors (Bandura, 1977).

Based on previous studies exploring language learners' adoption and use of technological resources for out-of-class learning also, various internal and external influencing factors have been identified. Some of the internal factors are found to be related to aspects which are personal and psychological such as language learning beliefs and goals (Lai et al., 2017a), as well as learners' perception of the usefulness of, attitudes toward, and capabilities in using the technological resources and tools

(Chung et al., 2015; Kim & Lee, 2016; Lai, 2013; Rahimi & Katal, 2012). The external factors, on the other hand, are demonstrated through social influence in the form of support from language instructors and peers, institutional support like workshop and training, and technological accessibility that include the Internet and learning resources (Castellano et al., 2011; Lai, 2013; Morgan, 2012). These influencing factors as reported in the previous studies also reflect UTAUT model's constructs consisting of effort expectancy, performance expectancy, social influence, and facilitating conditions. Although UTAUT2 is the most recent extended version of UTAUT, the habit and price value constructs of the model, which refer to habitual or automatic behaviour toward the use of technology and beliefs regarding its monetary costs, respectively, are irrelevant to the present study. This is because independent learning in the context of this study refers to learners' use of mobile devices to access open online resources with the intent to learn.

Accordingly, previous studies in the field of mobile learning have demonstrated the significant influence of the four UTAUT constructs on students' decision to accept and use mobile learning technology (Hu & Lai, 2019; Kim et al., 2017; Masrek & Samadi, 2017; Zaifudin Zainol et al., 2017), including for language learning (Ahn, 2018; Ho et al., 2016). However, while most of these studies focused on mobile learning in formal learning contexts that involve the use of specific virtual learning platforms, Malaysian ESL learners not only learn through such platforms on their mobile devices, but also use various mobile resources to facilitate their learning (Chan & Ang, 2017; Harwati Hashim et al., 2018; Ratnawati Mohd Asraf & Nadya Supian, 2017; Thang et al., 2016). This is especially true given the limited instructional time they usually have (Nooreiny Maarof & Indira Malani, 2015).

Therefore, the use of UTAUT in this study is crucial as it explains the motivations behind language learners' use of mobile technologies to support their own learning and adds to the literature in this currently under-researched area.

Besides, the four UTAUT factors have been proven to be influential in determining the adoption and use of technology in a voluntary usage context (Kim et al., 2017; Lai, 2013; Lai et al., 2012; Moghavvemi et al., 2017; Morgan, 2013; Venkatesh et al., 2003). In other words, when the technology adoption and use decision is made by students themselves (i.e., voluntary use), the tendency is for them to be influenced by the ease of using the technology (i.e., effort expectancy) and the benefits relating to learning performance from using the technology (i.e., performance expectancy). Students are also more likely to use the technology when they perceive support from their important others (i.e., social influence), as well as support in the form of technical facilities (i.e., facilitating conditions). In the Malaysian context, however, most of the previous studies that have integrated UTAUT are limited to investigating the influence of the factors on the adoption of mobile learning by ESL learners in educational institutions (Harwati Hashim et al., 2016; Mekhzoumi et al., 2018; Zaifudin Zainol et al., 2017). Therefore, the extent of the influence of the UTAUT constructs on learners' adoption and use of mobile learning for their informal English learning is unclear and requires further investigation.

As mobile learning is still in its infancy in many educational institutions, including Malaysia, its use is mostly voluntary and driven by the internal motivations of the end-users (Huang, 2014; Ooi et al., 2018; Nikolopoulou, 2018). External issues such as diverse and sophisticated platforms or applications, as well as

availability of regular Internet connection, may also affect students' access to mobile learning resources (Hao et al., 2017). Consequently, by identifying the internal and external influencing factors, which is the aim of this very study, relevant stakeholders like language instructors, administrators, and software developers may be able to determine the possible areas of support, as well as issues to be considered, to help optimise independent MAEL practice among ESL learners (Lai et al., 2017a; Lai et al., 2016). For these reasons, there is a call for more exploration into Malaysian ESL undergraduates' self-initiated use of MAEL, particularly their perceptions of the factors that drive the usage.

1.3 Statement of the Problem

In line with the advancement of technology especially in this 21st century, Malaysian ESL learners are expected to be able to self-direct their own English learning by making the most of various digital language learning resources in their informal learning environments. This is also in accordance with the aspiration of the Malaysian Education Blueprint for Higher Learning (2015-2025) that promotes the use of technology for autonomous English learning among its higher learning students (Sidhu et al., 2017). Furthermore, with the widespread ownership and usage of mobile devices among students in Malaysian tertiary institutions (Malaysian Communications and Multimedia Commission, 2017), the educational opportunities for them have tremendously increased (Arokiasamy, 2017). Prior studies have also suggested Malaysian ESL undergraduates' readiness for MAEL due to their familiarity with the computational and technological skills necessary for MALL (Murugan et al., 2017; Supyan Hussin et al., 2012).

Accordingly, findings of several past studies have shown that Malaysian ESL learners use their mobile devices to find word meanings (Anum Ariffah Mustapha & Siti Anisah Mohd Hatta, 2018; Chan & Ang, 2017; Harwati Hashim et al., 2018), practise speaking (Ratnawati Mohd Asraf & Nadya Supian, 2017) and perform online self-tests, quizzes or practice (Thang et al., 2016). Unfortunately, some other studies also found that Malaysian ESL learners prefer to use various technologies for leisure and social interactions instead of educational purposes (K. W. Lee et al., 2014; Thang et al., 2014). This situation is worrying for it will restrict the development of learner autonomy among Malaysian ESL undergraduates as targeted by the government. However, the motivations behind MAEL practices among Malaysian ESL learners are unclear. In particular, the factors that influence their independent use of mobile devices for English learning have not been studied adequately (Harwati Hashim et al., 2016; Mekhzoumi et al., 2018). This inadequacy hinders ESL instructors from devising strategies to help Malaysian ESL learners who rarely practise MAEL which may also result in hampering Malaysia's education aspirations to produce more autonomous Malaysian ESL learners. This is especially because previous studies have shown that such strategies could be devised by analysing the factors that influence the use behaviour among English language learners who actually use MAEL (Botero et al., 2018; Joo et al., 2014).

Therefore, how certain internal and external factors can contribute to independent MAEL need to be explored and explained further. Accordingly, this very study aims to investigate the independent use of mobile devices for English learning among Malaysian ESL undergraduates and identify the internal and external factors influencing such use. More specifically, it attempts to investigate the

influence of the internal and external factors on the MAEL use by using UTAUT model. Previous related studies have demonstrated the significant influence of the four main UTAUT constructs which are performance expectancy, effort expectancy, social influence, and facilitating conditions, on students' decision to adopt and use mobile learning technologies (Kim et al., 2017; Masrek & Samadi, 2017; Zaifudin Zainol et al., 2017), including for language learning (Ahn, 2018). Furthermore, these four factors have been proven to be influential in determining the adoption and use of technology in a voluntary usage context (Kim et al., 2017; Lai, 2013; Lai et al., 2012; Moghavvemi et al., 2017; Morgan, 2013; Venkatesh et al., 2003).

However, the four main constructs of UTAUT (social influence, facilitating resources, effort expectancy and performance expectancy) may not be able to fully explain the use of mobile technology in the context of this study. This is because UTAUT was particularly developed to explain technology use behaviour in the workplace context and did not account for factors from an educational perspective. Hence, this study attempts to extend the model by considering two other prominent factors in technology adoption and use studies that originated from Social Cognitive Theory; self-regulated learning (SRL) and mobile self-efficacy. While self-regulated learners tend to have better understanding of the relevance of using certain technologies in enhancing their learning (Huffman et al., 2013), the belief that one has sufficient skills to perform technology related tasks successfully is also significant (Juarez Collazo et al., 2014). Furthermore, past studies in the Malaysian context have demonstrated that self-regulated learners (Anthonysamy et al., 2020; Rafiza Abdul Razak & Khor, 2018) and learners with high technology self-efficacy

(Latip et al., 2020) tend to be more successful in embracing digital technologies and digital learning.

More importantly, although the two factors have been widely reported as closely related to learners' self-initiated use of technology for language learning (Lai & Gu, 2011; Lai, 2013), their application in studying mobile learning adoption and use has been limited (Hani, 2015; Rahimi & Katal, 2012). Consequently, the extent to which SRL and mobile self-efficacy account for independent MAEL among Malaysian ESL undergraduates requires further exploration. Besides, much literature has indicated the influence of the internal motivational factors such as perceived usefulness, ease of use and ICT-related self-efficacy (Liaw & Huang, 2013), and the external ones like social influence (Lai, 2013) and facilitating resources (Azevedo et al., 2012) on learners' self-regulation in technology-supported learning environment. With such relationships also reported, it implies that the motivational factors may not lead to successful technology usage if self-regulation of learning is absent among learners. Therefore, as pertains to this very research, it suggests SRL as a mediator that mediates the association between the proposed internal and external factors and the MAEL use behaviour among Malaysian ESL undergraduates.

Ultimately, this very research aims to provide some clarifications on how the UTAUT variables, with the addition of SRL and mobile self-efficacy, help to explain Malaysian ESL learners' independent MAEL. By identifying these influencing factors and their relationships, researchers and educators in the English language field could work collectively to implement appropriate strategies, both at the personal and environmental levels, in optimising such MAEL practice among Malaysian ESL undergraduates. In addition, while the original UTAUT model

include four moderators (i.e., gender, age, experience, and voluntariness), the present study only retained gender as a moderator. The discrepancies in the prior literature pertaining to the influence of gender on students' decision to adopt and use technology for learning (Goswami & Dutta, 2016) suggest that the moderating effect of gender is inconclusive. Hence, this study seeks to probe the effect of gender on the association between the factors and independent MAEL use so that different strategies for optimising the usage could be formulated based on gender.

1.4 Research Aims

In support of Malaysia' education aspirations for developing independent and autonomous Malaysian undergraduates, this study aims to propose a model on the independent MAEL for Malaysian ESL undergraduates. In particular, the model is expected to demonstrate the relationships between the internal and external factors (i.e., mobile self-efficacy, effort expectancy, performance expectancy, social influence, and facilitating resources) and SRL, which in turn result in the successful independent use of mobile devices for English learning. More specifically, the model aims to explain the role of SRL as a mediator that mediates the relationship between the factors and the independent MAEL among Malaysian ESL undergraduates.

1.5 Research Objectives

To meet the aims of the study, the following research objectives (RO) are formulated;

RO 1: To determine whether the following factors influence independent MAEL among Malaysian ESL undergraduates:

(a) internal factors: performance expectancy, effort expectancy, and mobile self-efficacy.

(b) external factors: social influence and facilitating resources.

RO 2: To determine whether self-regulated learning influences independent MAEL among Malaysian ESL undergraduates.

RO 3: To examine whether the following factors influence Malaysian ESL undergraduates' self-regulation of learning:

(a) internal factors: performance expectancy, effort expectancy, and mobile self-efficacy.

(b) external factors: social influence and facilitating resources.

RO 4: To determine if there is a mediating effect of self-regulated learning on the relationship between the internal and external factors and independent MAEL among Malaysian ESL undergraduates.

RO 5: To examine whether the influences of the factors on independent MAEL among Malaysian ESL undergraduates differ between genders.

1.6 Research Questions

Based on the above-mentioned research objectives, the following research questions (RQ) are derived;

RQ 1: Do the following factors influence independent MAEL among Malaysian ESL undergraduates?

a) internal factors:

- i. Does performance expectancy influence independent MAEL among Malaysian ESL undergraduates?
 - ii. Does effort expectancy influence independent MAEL among Malaysian ESL undergraduates?
 - iii. Does mobile self-efficacy influence independent MAEL among Malaysian ESL undergraduates?
- b) external factors:
- i. Does social influence influence independent MAEL among Malaysian ESL undergraduates?
 - ii. Do facilitating resources influence independent MAEL among Malaysian ESL undergraduates?

RQ 2: Does SRL influence independent MAEL among Malaysian ESL undergraduates?

RQ 3: Do the following factors influence Malaysian ESL undergraduates' SRL?

- a) internal factors:
- i. Does performance expectancy influence Malaysian ESL undergraduates' SRL?
 - ii. Does effort expectancy influence Malaysian ESL undergraduates' SRL?
 - iii. Does mobile self-efficacy influence Malaysian ESL undergraduates' SRL?
- b) external factors:
- i. Does social influence influence Malaysian ESL undergraduates' SRL?

- ii. Does facilitating resources influence Malaysian ESL undergraduates' SRL?

RQ 4: Is there a mediating effect of SRL on the relationship between the following factors and independent MAEL among Malaysian ESL undergraduates?

a) internal factors:

- i. Does SRL mediate the relationship between performance expectancy and Malaysian ESL undergraduates' independent MAEL?
- ii. Does SRL mediate the relationship between effort expectancy and Malaysian ESL undergraduates' independent MAEL?
- iii. Does SRL mediate the relationship between mobile self-efficacy and Malaysian ESL undergraduates' independent MAEL?

b) external factors:

- i. Does SRL mediate the relationship between social influence and Malaysian ESL undergraduates' independent MAEL?
 - a. Does SRL mediate the relationship between facilitating resources and Malaysian ESL undergraduates' independent MAEL?

RQ 5: Do the influences of the factors on independent MAEL among Malaysian ESL undergraduates differ between genders?

1.7 Significance of the Study

The significance of this study is reflected through its potential contributions to the body of knowledge specifically for the improvement of practice, theory, and

methodology. In terms of its practical contribution, since this study aims to investigate Malaysian ESL undergraduates' use mobile devices for English learning, it may shed some light on their MAEL usage. This will help ESL instructors, especially, in identifying some of the common MAEL activities among this group of ESL learners. Such information may guide ESL instructors in coming up with suitable plans as to encourage a more varied MAEL activities among Malaysian ESL undergraduates. Furthermore, the findings of this research provide valuable insights about which aspects that impact Malaysian undergraduates' decision to use their mobile devices for English learning.

The identification of performance expectancy, mobile self-efficacy, social influence, facilitating resources, and SRL as the impacting factors conveys the area of support that Malaysian stakeholders must put emphasis on, especially in achieving the aspiration to produce autonomous Malaysian ESL undergraduates. The findings pertaining to the mediating role of SRL will also guide ESL instructors, university administrators, and mobile learning developers on how to optimise independent MAEL behaviour by incorporating SRL elements into classroom instruction and the designs of MAEL resources. Moreover, recognising the gender differences in ESL learners' perceptions and use of MAEL will inform stakeholders of the need to prepare different strategies for males and females in enhancing their independent MAEL practice.

The theoretical significance lies in the aim of the study which is to propose a model for the independent use of mobile devices for English learning among Malaysian ESL undergraduates. This is significant as the proposed model extends UTAUT by adding two constructs which are closely related to the Social Cognitive

Theory (SCT); self-regulated learning and mobile self-efficacy. Besides, since the two factors are reportedly highly influential in determining language learners' independent use of technology, this study is significant as it allows for better explanation of the MAEL use behaviour among Malaysian ESL undergraduates. In this way, the integration of UTAUT and SCT highlights the mediating role of SRL on the relationship between the use of MAEL and its influencing factors consisting of effort expectancy, performance expectancy, mobile self-efficacy, social influence, and facilitating resources. Consequently, it may contribute more knowledge to the existing studies in the general area of MALL adoption and use and offer some new possibilities for future studies.

In meeting the research objectives, this very study applies a quantitative research approach which involves the use of a questionnaire as the data collection method. Hence, it is significant as it provides a questionnaire that adapts related scales from various reliable sources to suit the conceptualisation and operationalisation of the internal and external factors as pertain to the context of the study. To illustrate, the constructs are categorised as having an internal orientation when reflecting technology-related personal factors (i.e., effort expectancy, performance expectancy, and mobile self-efficacy) and external when referring to influences coming from the learning environment (i.e., social influence and facilitating resources). The scale adaptation process of the present study stemmed from the discrepancies found in the conceptualisation and operationalisation of the constructs by researchers in previous studies. Thus, the instrument can be used and adapted by other researchers to explore the internal and external factors that

influence the adoption and use of various technologies for independent language learning.

1.8 Scope and Limitation of the Study

The scope of the study is limited to Malaysian ESL undergraduates who were enrolled in a diploma or bachelor's degree program in the representative universities located in the different parts of Malaysia. In addition, whereas the present study aims to examine the factors influencing the independent use of mobile devices for English learning, it would be impossible to include all potentially relevant variables mentioned in the literature in a single model. Thus, the key factors derived from the well-known UTAUT model are investigated in this study (i.e., effort expectancy, performance expectancy, social influence, and facilitating resources), along with the addition of two variables suggested based on the literature (i.e., mobile self-efficacy and SRL). Since the sample of this study does not include all undergraduates, the research findings can only be generalised to Malaysian undergraduates' population with similar characteristics. More specifically, it only relates to ESL undergraduates studying in the Malaysian public universities and using their mobile devices for English learning.

1.9 Definition of Terms

Some of the terms used in this study are defined in accordance to their respective contexts as follows;

1.9.1 Independent Learning

In an informal learning context, learners have the privilege to decide on when, where, what, and how to learn (Song & Bonk, 2016). This can also be characterised as an independent learning as the learning occurs outside of the formal educational contexts (Hall, 2009). In general, the term independent learning, also known as self-directed learning, refers to ways of learning by yourself (Benson, 2001a). In other words, it is “learning that is carried out under the learners’ own direction, rather than under the direction of others” (Benson, 2001b, p. 34). In relation to English learning, the activities include listening to English songs, reading English newspaper and books, watching televisions, and playing games (Benson, 2013), in which the attention is focused on language learning (Reinders & Benson, 2017).

1.9.2 Independent Mobile Assisted English Learning

In technology adoption and use studies, use behaviour refers to user’s actual use of a technology (Venkatesh et al., 2003) in which the degree of use is determined through objective and subjective measures (Agudo-Peregrina et al., 2014). In the context of this very study, the use behaviour refers to the self-reported frequency of mobile devices (i.e., their smartphone or tablet) use for English learning among Malaysian ESL undergraduates. In other words, it relates to their independent mobile assisted English learning (MAEL) activities. Independent MAEL, in this sense, means that the mobile learning is carried out under learners’ own direction, rather than under the direction of others.

1.9.3 Internal Factors

In explaining factors that affect an individual's technology use, the internal factors have been described as the individual's personal characteristics such as computer self-efficacy, computer anxiety, and learning styles (Coleman & Mtshazi, 2017; Shayo et al., 2000), as well as attitudes toward and beliefs about technology (Chung et al., 2015; Lai et al., 2017a). Accordingly, in the present study, the internal factors are defined as personal factors that facilitate technology use behaviour among Malaysian undergraduates and the factors consist of effort expectancy, performance expectancy, and mobile self-efficacy.

1.9.4 Performance Expectancy

Performance expectancy is a UTAUT factor that is defined as “the degree to which using a technology, or a system will provide benefits to consumers in performing certain activities” (Venkatesh et al., 2012, p.159). In the educational context, it may be redefined as the extent to which a student believes that using a system or a technology will help him or her attain benefits relating to learning performance (Wong et al., 2013). In the context of present study, performance expectancy is defined as the extent to which Malaysian ESL undergraduates believe that using mobile technology will help them attain benefits in relation to their English language learning.

1.9.5 Effort Expectancy

Effort expectancy, also a factor that derived from the UTAUT, is defined as the perceived degree of ease associated with the use of a technology or a system (Venkatesh et al., 2003). In accordance with Venkatesh et al.'s (2003) definition, in

the present study, effort expectancy refers to the extent to which Malaysian ESL undergraduates perceive the ease-of-use of using mobile devices for English learning, on their own.

1.9.6 Mobile Self-Efficacy

Mobile self-efficacy is described as an individual's judgement about being able to not only use a mobile device and the services it offers, but also to apply such ability to wide-ranging tasks (Lee & Hsieh, 2009; Oakley & Palvia, 2012). The concept is also highly associated with a user's familiarity as well as knowledge of mobile technology (Wu et al., 2016). In line with the above-mentioned definitions of mobile self-efficacy, in this research, it is defined as Malaysian ESL undergraduates' judgement of their familiarity with, knowledge of, and ability to use the functions of mobile devices for English learning.

1.9.7 External Factors

Shayo et al. (2000) described the external factors affecting the integration of computers into the school curricula as "factors outside the control of the individual teacher". These 'outside of user's control' factors are also explained as the conditions in the external environment that facilitate or inhibit technology use behaviour (Coleman & Mtshazi, 2017; Limayem et al., 2001), including external others (Venkatesh et al., 2008). Accordingly, in the present study, the external factors refer to the influences coming from the environment such as their social circle and technology as well as resource availability (i.e., social influence and facilitating resources).

1.9.8 Social Influence

A factor that derived from UTAUT, social influence considers the extent to which an individual perceives that important others like family or friends believe he or she should use a technology (Mazharuddin Syed Ahmed, 2016; Venkatesh et al., 2012). In the educational settings, studies have shown that students are inclined to use a technology when it is recommended by their peers and teachers (Agudo-Peregrina, et al., 2014; Lai et al., 2012; Lai et al., 2017b). Therefore, in the context of this very study, social influence is defined as the extent to which Malaysian ESL undergraduates perceive that people who are important to them (i.e., peers and teachers) support their use of mobile technology for English learning.

1.9.9 Facilitating Resources

According to Ajzen (1991), the performance of a particular behaviour is facilitated by the availability of external resources known as the facilitating conditions. The construct of facilitating conditions is broad-ranging as it encompasses the availability of support, infrastructure, training and knowledge in using a technology (Agudo-Peregrina et al.; 2014; Taylor & Todd, 1995; Venkatesh et al., 2008). However, as the facilitating conditions in the context of this study are described as the external environmental factors, the construct is referred to as facilitating resources. Facilitating resources in this study are defined as the extent to which Malaysian ESL undergraduates perceive the availability and accessibility of learning and technological resources in using their mobile devices for independent English learning.

1.9.10 Self-Regulated Learning

In the context of L2 (i.e., ESL and EFL) learning, self-regulated learning refers to the process during which L2 learners proactively use strategies to improve English language skills by having language learning goals (Azizah Mohd Zahidi, 2012). This process, which corresponds to the definition of SRL by Chamot (2018), is specifically described in this very study as Malaysian ESL undergraduates' ability to control their own MAEL by setting goals, planning how to achieve them, monitoring the learning, using learning strategies to solve problems, and evaluating their own performance.

1.10 Summary of the Chapter

This chapter discusses the link between mobile technology advancement and the independent use of the technology for language learning among language learners. The discussion also touches on such phenomenon in the Malaysian context, including the lack of research in this area. Then, the research problems are highlighted leading to the proposal of the research objectives and questions. The definitions of the research terms are also presented in this chapter. Overall, this study aims to develop a model to examine the influence of internal and external factors on language learners' independent use of mobile devices for learning through the mediating role of SRL.