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RESEARCH PAPER

# Acceptance and Use of Mobile Technologies in Learning and Teaching of EFL: An Economic Perspective

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Abstract

The use and integration of mobile information and communication technologies (ICTs) in learning and teaching, as well as the creation of new knowledge can determine whether a country is able to successfully compete in the emerging global knowledge economy. Technology acceptance theories and models have been widely developed, used and extended to determine the factors related to the acceptance of such technologies in specific national and subject contexts. This study set out to explore the key factors that determine students' and instructors' use behaviour and behavioural intentions to use mobile technologies in learning and teaching EFL, in an effort to determine the readiness and acceptance of mobile learning and teaching among students and instructors at a higher education institution in Saudi Arabia. The extended Unified Theory of Acceptance and Use of Technology (UTAUT2), was used as the framework for this study. This model takes into account several perspectives; and was designed to assess technology acceptance beyond the organisational context by embedding consumer context dimensions. The results indicated that the research model was partially confirmed and highlighted key variables as the driving forces of use behaviour and behavioural intention to use mobile technologies in learning and teaching EFL.

Keywords

Mobile technologies, mobile learning & teaching, Unified Theory of Acceptance and Use of Technology (UTAUT2), English as a foreign language (EFL), consumer context, economic perspective.

## 1. Introduction

The boom in mobility and communication has affected every aspect of peoples' lives; and learning and teaching are not an exception. Hence, there is a need to reconceptualise learning and teaching for the mobile age and build on the skills and knowledge of students and faculty. However, this trend towards greater use of mobile technologies is responsible for several challenges faced by higher education institutions, including the changing nature of knowledge, the changing nature of students, and the changing nature of the expectations of the global market. Therefore, for nations to stay competitive and successfully address global competition, a continuous stream of new skills, tools, and knowledge is needed in higher education. Consequently, Mason (2006) advocates that higher education institutions around the world are under pressure to improve the quality of their teaching and learning by integrating up-to-date technologies.

A great body of research into ICTs has encouraged the widespread use of mobile technologies in learning and teaching across all disciplines. Such studies are even more prominent in demonstrating the potential, and confirming the efficacy of ICTs in the field of English foreign language learning and teaching (Hsu, 2013; Taj et al, 2016). Studies that have been conducted on the pedagogical use of mobile technologies, usually, resulted in universal findings, but much depends on the context in which these technologies are applied. Hence, the purpose of this study was to investigate the unique context of Saudi Arabia, by understanding the aspirations and motivations of stakeholders of learning and teaching, i.e., students and faculty as a prerequisite for the implementation of mobile technologies in EFL teaching and learning.

## 2. Mobile technologies and EFL learning and teaching

English is both a global language, and also the language of academic discourse. According to the British Council (2013), English is spoken to a useful level by 1.7 billion people, a quarter of the world's population; and is perceived as crucially important for educational and professional success (O'Neill, 2014). Consequently, EFL teaching and learning is becoming more and more necessary, and hence popular, in universities in Saudi Arabia, as well as around the world.

Thinking of Saudi Arabia as a non-English environment, where English can only be learned in English classrooms, considering different technologies that could provide language learning settings, and bearing in mind the kind of digital age we are living in, leads to the fact that the contribution of mobile technologies will be crucial in such circumstances. Furthermore, using mobile technologies to extend foreign language learning outside classrooms, with frequent informal practices, is essential for language acquisition (Kukulska-Hulme, 2009; Kukulska-Hulme 2012). It is clearly stated by Pemberton et al. (2010) that: "mobile phones have a number of characteristics that can be exploited to design the most appropriate learning services for language learners" (p. 144). Although it is evident that

> *mobile learning is proving to be a fertile ground for innovation, it is important to realise that the success of mobile learning will depend on human factors in the use of the new mobile and wireless technologies. It is only now that the challenges of mobile learning on a larger scale, and with diverse populations of students, are beginning to be understood.* (Kukulska-Hulme, 2007, p. 1).

Furthermore, in the new era of the global economy, which affects higher education, and where learners are the consumers whose needs should be addressed, Kukulska-Hulme (2009) argued that conflict might occur, since the new generation of learners are adopting new mobile technologies for themselves, irrespective of whether their instructors adopt them or not, in formal education. However, even though recent research show a positive result for students' perceptions of mobile learning, and although many studies have proven the effectiveness of mobile technologies in learning and teaching (AlFahad, 2009; Rogers et al, 2010; Venkatesh et al, 2006), it is still a challenge to implement such technologies, due to barriers that arise from social, cultural, and institutional factors (Corbeil & Valdes-Corbeil, 2007; Traxler, 2007; Traxler, 2010).

In the context of higher education in Saudi Arabia, students are learning complicated subjects such as medicine, health sciences, and science, but by being taught in a language that is not their own mother tongue or even a second language, it is a foreign language. Bearing in mind the new opportunities for EFL learning, created by the implementation of mobile learning and teaching, factors that determine students' and faculty use behaviour and behavioural intention to use mobile technologies in learning and teaching EFL ought to be given major consideration, as it will impact on the effectiveness of teaching and learning in those subjects, like medicine, where instruction is almost always in English.

## 3. Methodology

The purpose of this study was to examine the factors that determined students' and faculty use behaviour and behavioural intention to use mobile technologies in EFL learning and teaching. The research framework for this study was adapted from the extended Unified Theory of Acceptance and Use of Technology (UTAUT2), developed by Venkatesh, Thong & Xu (2012), with appropriate modifications (see Figure1). The research model hypothesised that performance expectancy (PE), effort expectancy (EE), social influence (SI), facilitating conditions (FC), hedonic motivation (HM), price of devices (P-Devices), price of services (P-Services), and habit (H) will significantly predict behavioural intentions (BI) to use mobile technologies in learning and teaching EFL, and use behaviour (UB) as well (see Table 1). This model was designed to assess technology acceptance beyond the organisational context by including consumer context dimensions.

The sample consisted of 878 university students (51.3% males and 48.7% females) who were studying English as a foreign language in the Preparatory Year English Language (PYEL) program at Taibah University and 65 English language instructors (40% males and 60% females). Based on the research framework, students and faculty were considered as consumers of mobile technologies within an organisational context.

The data was collected using two surveys, one for students and one for faculty. These two surveys were based directly on the survey items developed by Venkatesh et al. (2003) and Venkatesh et al. (2012), as well as on the literature review of previous research on mobile technologies acceptance.

Table 1. Key Constructs (Independent Variables)

| Key Construct (Independent Variable) | Definition |
|---|---|
| Performance Expectancy | The degree to which using mobile technologies will provide benefit in teaching & learning EFL. Adapted from the UTAUT2 (Venkatesh et al., 2012) |
| Effort Expectancy | The degree of ease associated with using mobile technologies in teaching & learning EFL. Adapted from the UTAUT2 (Venkatesh et al., 2012) |
| Social Influence | The degree to which students & instructors perceive that important others (i.e., family, friends, society) believe they should or should not use mobile technologies in teaching & learning EFL. Adapted from the UTAUT2 (Venkatesh et al., 2012) |
| Facilitating Conditions | The degree to which students & instructors believe that resources and support are available to use mobile technologies in teaching & learning EFL. Adapted from the UTAUT2 (Venkatesh et al., 2012) |

| | |
|---|---|
| Hedonic Motivation | The degree to which students & instructors have fun or pleasure derived from using mobile technologies in teaching & learning EFL. Adapted from the UTAUT2 (Venkatesh et al., 2012). |
| Price | The degree to which students & instructors perceived the benefits of using mobile technologies in teaching & learning EFL as of greater value than the monetary cost. Adapted from the UTAUT2 (Venkatesh et al., 2012) |
| Habit | The degree to which students & instructors tend to use mobile technologies in teaching & learning EFL automatically. Adapted from the UTAUT2 (Venkatesh et al., 2012) |

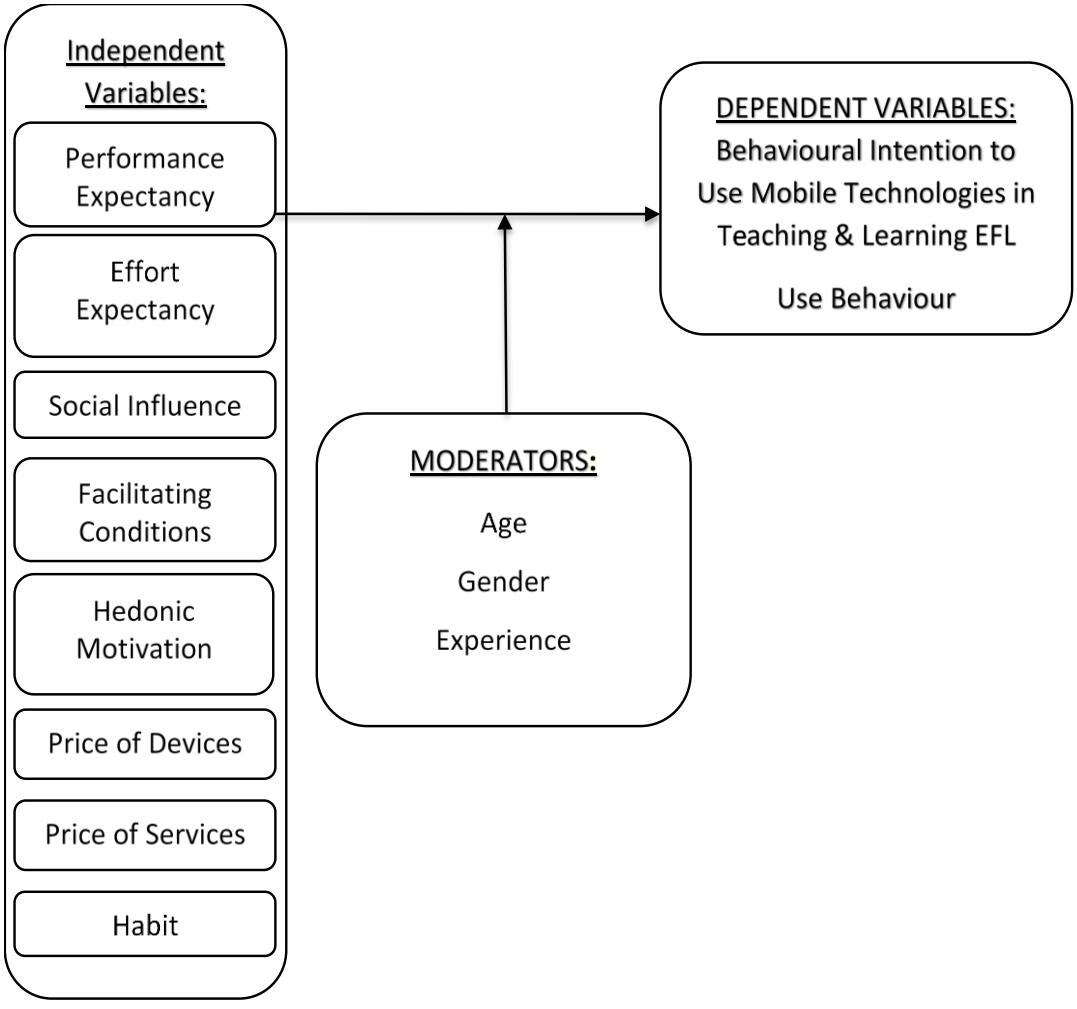


Figure 1. Research Model for Higher Education Acceptance of Mobile Technologies in Teaching & Learning EFL.

## 4. Results

Once the data was obtained, statistical techniques were used to analyse the responses, and to confirm or reject the research model (see Figure 1). Descriptive and inferential

statistics were calculated, and various statistical techniques were utilised: exploratory factor analysis (EFA), correlation, cross-tabulation, regression analysis, analysis of variance (ANOVA), and the T-test. The significance level for the tests used in this study was set at 5%, although when the results were significant at the 1% level, this was reported.

### *4.1. Student Survey*

Data analysis revealed the predictive power of the research model. Looking at the model summary (Table 2), we find that facilitating conditions, hedonic motivation, performance expectancy, habit, and social influence explain 49.3% of the variance in behavioural intention of the students to use mobile technologies in learning EFL. This result was statistically significant (R2Adj=.493; F(5,864)= 169.788, p<.001).

To compare the contribution of each independent variable to the prediction of the dependent variable, Beta (Standardised Coefficients- β) weights were used (see Figure 2). Based on the level of significance for each beta weight (p values), and by adopting a 5% significance level as the threshold for excluding variables, we can see that the behavioural intention of students to use mobile technologies in learning EFL was significantly explained by five out of eight initial independent variables.

Table 2. Predictors of Behavioural Intention[f] (Student Survey)

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change |
| 1 | .601[a] | .361 | .360 | .79692379 | .361 | 490.333 | 1 | 868 | .000 |
| 2 | .658[b] | .434 | .432 | .75074315 | .073 | 111.071 | 1 | 867 | .000 |
| 3 | .685[c] | .470 | .468 | .72679979 | .036 | 59.065 | 1 | 866 | .000 |
| 4 | .699[d] | .489 | .487 | .71371976 | .020 | 33.032 | 1 | 865 | .000 |
| 5 | .704[e] | .496 | .493 | .70965788 | .006 | 10.930 | 1 | 864 | .001 |

a. Predictors: (Constant), Facilitating Conditions
b. Predictors: (Constant), Facilitating, Hedonic Motivation
c. Predictors: (Constant), Facilitating Conditions, Hedonic Motivation, Performance Expectancy
d. Predictors: (Constant), Facilitating Conditions, Hedonic Motivation, Performance Expectancy, Habit
e. Predictors: (Constant), Facilitating Conditions, Hedonic Motivation, Performance Expectancy, Habit, Social Influence
f. Dependent Variable: Behavioural Intention

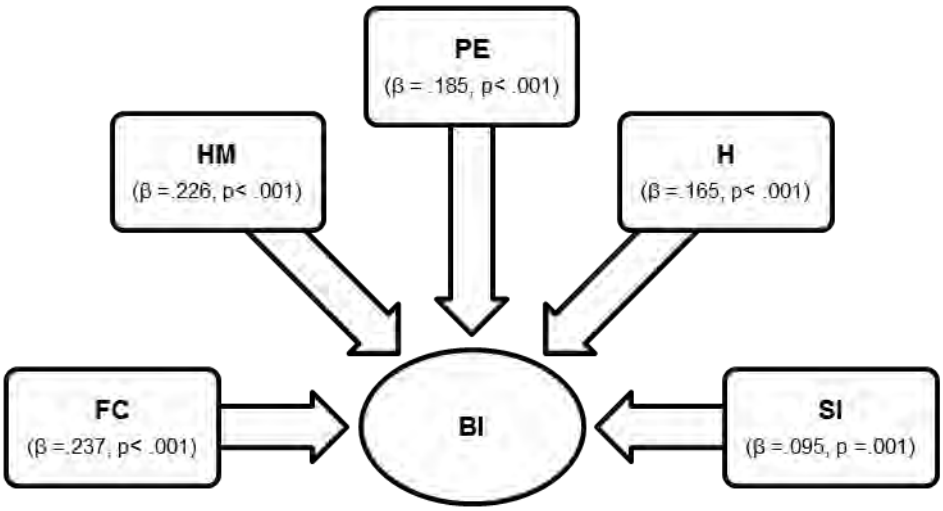


Figure 2. Beta Weights & p Values for all the Independent Variables with Significant Contribution to Behavioural Intention (Student Survey).

On the other hand, an examination of students' use behaviour, with respect to mobile technologies for learning EFL, revealed that the independent variables that determine use behaviour are not the same as those that determine behavioural intention to use mobile technologies in learning EFL. Looking at the model summary (Table 3), we find that habit, facilitating conditions, price of devices, social influence, and price of services are statistically significant determinants (R2Adj=.281; F(5,864)= 68.767, p<.001) of students' use behaviour. The contribution of each of those determinants is displayed in Figure 3.

Table 3. Predictors of Use Behaviour in EFL[f] (Student Survey)

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change |
| 1 | .475[a] | .226 | .225 | .88018060 | .226 | 253.431 | 1 | 868 | .000 |
| 2 | .513[b] | .264 | .262 | .85898250 | .038 | 44.370 | 1 | 867 | .000 |
| 3 | .526[c] | .277 | .275 | .85159475 | .013 | 16.108 | 1 | 866 | .000 |
| 4 | .530[d] | .281 | .278 | .84965517 | .004 | 4.958 | 1 | 865 | .026 |
| 5 | .534[e] | .285 | .281 | .84811422 | .003 | 4.146 | 1 | 864 | .042 |

a. Predictors: (Constant), Habit
b. Predictors: (Constant), Habit, Facilitating Conditions
c. Predictors: (Constant), Habit, Facilitating Conditions, Price of Devices
d. Predictors: (Constant), Habit, Facilitating Conditions, Price of Devices, Social Influence
e. Predictors: (Constant), Habit, Facilitating Conditions, Price of Devices, Social Influence, Price of Services
f. Dependent Variable: Use Behaviour in EFL

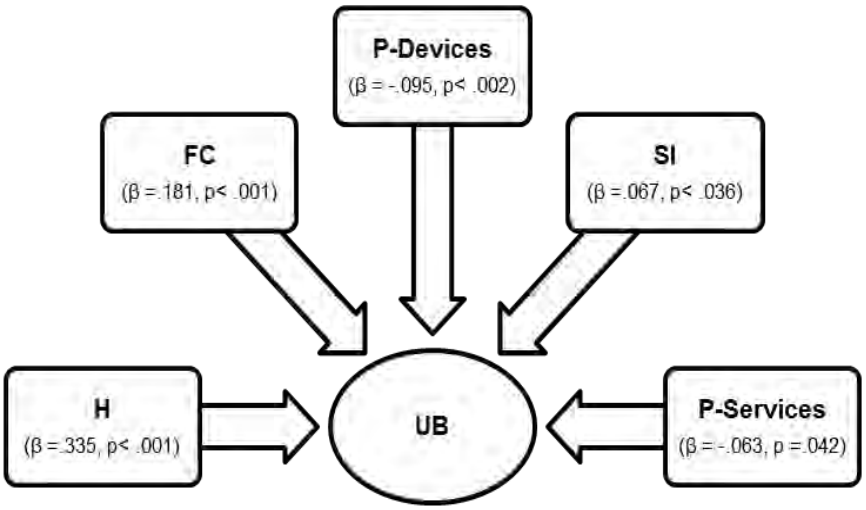


Figure 3. Beta Weights & p Values for all Independent Variables with Significant Contribution to Use Behaviour (Student Survey).

### *4.2. Faculty Survey*

The same process which was adopted to analyse the behavioural intention and use behaviour for students, was also used to examine the data obtained from faculty. Turning first to behavioural intention, the model summary (shown in Table 4) suggests that together effort expectancy and habit explain 52% of the variance in behavioural intention

of faculty to use mobile technologies in teaching EFL (R2Adj=.520; F(2,61)= 35.133, p< .001).

When all the beta weights are assessed, and the paths that are statistically insignificant (at the 5% level) are erased, the model that emerges is given in Figure 4.

Table 4. Predictors of Behavioural Intention[c] (Faculty Survey)

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change |
| 1 | .670[a] | .449 | .440 | .74244127 | .449 | 50.478 | 1 | 62 | .000 |
| 2 | .732[b] | .535 | .520 | .68725656 | .087 | 11.357 | 1 | 61 | .001 |

a. Predictors: (Constant), Effort Expectancy
b. Predictors: (Constant), Effort Expectancy, Habit
c. Dependent Variable: Behavioural Intention

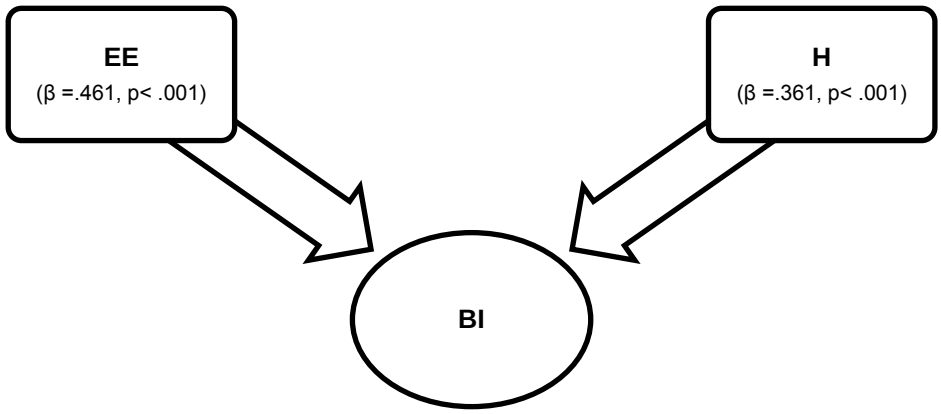


Figure 4. Beta Weights & p Values for the all Independent Variables with Significant Contribution to Behavioural Intention (Faculty Survey).

Having examined the determinants of behavioural intention for faculty, the same causal path, adopting the same statistical technique, was utilised to analyse the use behaviour. The model summary (Table 5) shows that fewer independent variables have a statistically significant impact in the case of the use behaviour, when compared with the model that predicts the use behaviour of students. Only habit and price of services contribute to 22.6% of the variance in use behaviour of faculty in teaching EFL. This result was statistically significant (R2Adj= .226; F(2,61)= 10.208, p< .001).

The beta weights in Figure 5 indicate that habit has an impact that is statistically significant at the 1% level, while the other variable, price of services, is only just significant at the 5% level.

Table 5. Predictors of Use Behaviour in EFL[c] (Faculty Survey)

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change |
| 1 | .445[a] | .198 | .185 | .90261778 | .198 | 15.327 | 1 | 62 | .000 |
| 2 | .501[b] | .251 | .226 | .87965996 | .053 | 4.278 | 1 | 61 | .043 |

a. Predictors: (Constant), Habit
b. Predictors: (Constant), Habit, Price of Services
c. Dependent Variable: Use Behaviour in EFL

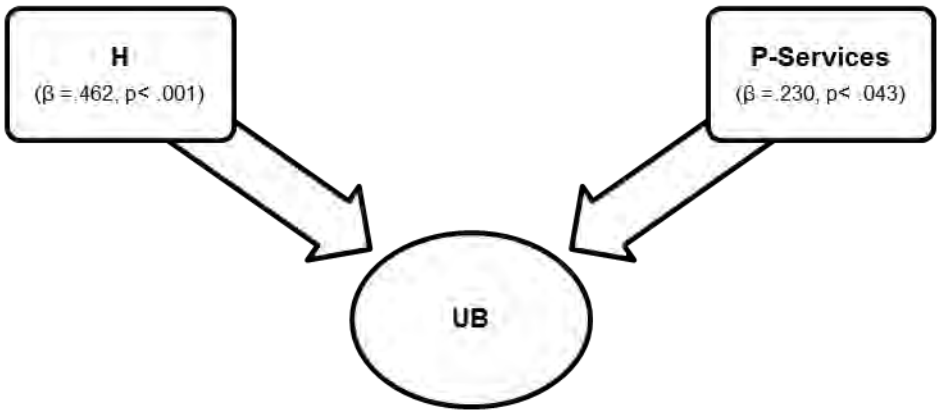


Figure 5. Beta Weights & p Values for all Independent Variables with Significant Contribution to Use Behaviour in EFL (Faculty Survey).

The findings of the study, as the data from the two surveys revealed, did not confirm the basic structure of the proposed model. These results and the variation throughout previous studies suggest that there is no definite model for technology acceptance that can be valid and reliable across different cultural and national contexts. Moreover, even within the same context, the robustness of the model might differ across different samples, as in the case of students and faculty in this study. Nevertheless, the deductive process which was employed permitted further specification of the theory (UTAUT2).

## 5. Discussion

For mobile learning and teaching, investigating and understanding factors that affect the behavioural intention and use behaviour is an essential prerequisite for successful implementation. Kukulska-Hulme (2007) argued that paying more attention to the context of use, understanding the requirements and motivators of all those involved in mobile learning including students and faculty, and investigating the factors impacting the usability of mobile technologies in education, would ensure the acceptability and usability of new technology. On the other hand, the popularity of mobile technologies, the high demand for better EFL learning and teaching, the tools and features of mobile technologies and the wide range of available mobile applications for EFL pedagogy, are all valid reasons to utilise up-to-date mobile technologies for EFL learning and teaching.

Results revealed that the driving force for the behavioural intention of using mobile technologies in learning EFL among students was the facilitating conditions variable, which indicated that fulfilling the students' need for support and guidance in using their mobile technologies for learning EFL, is critical to ensuring successful implementation of mobile learning. Hence, a detailed needs analysis is an essential further step. On the other hand, the effort expectancy variable was a primary determinant of the behavioural intention to

use mobile technologies in teaching EFL variable among faculty. Therefore, making sure that faculty have received adequate training, and gained the required skills to use mobile technologies effortlessly to facilitate teaching and learning, is a crucial prerequisite in order to implement mobile learning and teaching across the institution.

The habit variable played the most significant role in predicting the Use Behaviour of mobile technologies among both EFL students and faculty. This study showed that the automaticity in using mobile technologies in learning and teaching EFL is positively related to actual use. Hence, the habits of being heavily immersed in using mobile technologies for a significant time, among both students and faculty, can be transformed into the context of learning and teaching, by implementing the same technologies and applications.

When comparing the research results to the work done by the developers of the theory (UTAUT2), Venkatesh et al (2012), even though it was done in a different context (concerning mobile internet use among consumers in Hong Kong) the current findings indicated a strong predictive power for the UTAUT2 model in a consumer context within an organisation. This study revealed that the direct effect of the significant independent variables explained 49.3% of the variance in Behavioural Intention and 28.1% of the variance in use behaviour of mobile technologies in EFL learning among students; and 52% of the variance in behavioural intention and 22.6% of the variance in use behaviour of mobile technologies in EFL teaching among faculty. These figures can be assessed against comparable data calculated by Venkatesh et al (2012). The model developed by Venkatesh et al (2012) explained 44% of the variance in behavioural intention and 35% of the variance in use behaviour. Hence, with respect to behavioural intention, the model utilised in this study has greater predictive power, in statistical terms, than that of the pioneers of this technique of analysis. However, the difference between the results of applying the model (UTAUT2) proposed by Venkatesh et al (2012) in different nations, such as Saudi Arabia, suggests that to successfully integrate the use of mobile technologies in learning and teaching, the national context must be considered. Such a conclusion is supported by the findings of Al-Gahtani et al (2007) who found that cultural differences affect the acceptance and adoption of new information technologies (IT) in different societies when analysed by means of the validated UTAUT model.

These results demonstrate that considering the significant determinants that impacted on the behavioural intention and use behaviour of mobile technologies in EFL learning and teaching among students and faculty, as well as the frequent uses of mobile technologies and applications, individual educational institution should do more than approving and just letting such practices happen within the organisation. It is crucial to operate these determinants to guide the efforts of the organisation to integrate latest advancements and technologies, in order to address the challenges of EFL learning and teaching, in the context of Saudi Arabia.

Additionally, the national development plans of Saudi Arabia link socio-economic development with technology, particularly, in the Ninth Development Plan (2010-2014). The fourth theme addressed the development of the Saudi economy and the need to maximise the role of knowledge as a basic engine of economic growth. The objectives of this theme required special consideration and an increase in allocations for institutions of research and development, encouragement of innovations, and support for up-to-date information and communication technologies. The recent Tenth Development Plan (2015-2019), also, has ensured the role of optimal utilisation of ICTs and up-to-date innovations and technologies, in the nation's transition to a knowledge-based economy and enhancing the growth and stability of the national economy. Hence, mobile learning and teaching, as one of the latest trends in educational technologies, will be of great interest to stakeholders in Saudi Arabia. Despite the fact that, in the case of this study, the main policy makers and stakeholders are students and faculty (the consumers of mobile

technologies), since they have the power in their hands and pockets. Such power can shift up mobile learning and teaching into orthodoxy.

## 6. Conclusion

The findings of this empirical research provide crucial information that can guide the implementation of proactive interventions to widely improve the practices of learning and teaching; and greatly increase our understanding of the reasons for, and effectiveness of, the adoption of mobile technologies in higher education in Saudi Arabia. More importantly, as English continues to develop as the global language of business and commerce, and the lingua franca of academic and social media networks, the increased effectiveness of the use of mobile ICTs in teaching and learning English that results from this research will enable Saudi students to operate as global citizens within the emerging world knowledge economy, and increase significantly the human capital return on both the substantial investments in such mobile technologies, and in EFL teaching by the government of Saudi Arabia and its universities.

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