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Student's perceptions towards using e-learning via Facebook

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ABSTRACT

Research on utilising social networks for teaching and learning is relatively scarce in the context of information systems. There is far more emphasis on studying the usage of social networks towards fulfilling individuals' basic social needs. This study uses the unified theory of acceptance and use of technology (UTAUT2) to analyse students' intention to use and use of e-learning via Facebook. It incorporates playfulness into the UTAUT2 model and categorises the determinants of intention to use e-learning via Facebook into three categories, namely, hedonic values, utilitarian values, and communication values. The data were collected in a two-stage survey from 170 undergraduate students, and the model was tested using structural equation modelling. We found that hedonic motivation, perceived playfulness, and performance expectancy were strong determinants of students' intention to use e-learning, while habit and facilitating conditions all positively affected students' use of e-learning via Facebook. The results of this study report new knowledge that academic institutions can utilise to create appropriate e-learning environments for teaching and learning. A number of theoretical and managerial implications for universities' implementation technologies were also identified.

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E-learning; Facebook; hedonic and utilitarian motivation; intention; usage

1. Introduction

Researchers argued that social networks tend to be regarded as hedonic-oriented information technologies (Hu, Poston, and Kettinger 2011; Sledgianowski and Kulviwat 2008), and that individuals utilise social networks for fun, experiencing pleasure, and interacting with others (Chang, Chen, and Hsu 2011; Liu, Ho, and Song 2011; Miller and Melton 2015; Shih 2013). The use of social networks as learning platforms is an important issue that remains an open question, as social networks are mainly used in education as tools to support existing social relationships (Manca and Ranieri 2013). Some researchers argue that social networks have great potential to improve higher education experience (Kolek and Saunders 2008; Pasek, More, and Hargittai 2009; Roblyer et al. 2010). Sánchez, Cortijo, and Javed (2014) highlighted the importance of social networks for educational purposes and argued that social networking is one of the main revolutions in academia over the past few years. Facebook is one of the social networks that many students use for socialising and communicating with friends and family. While students may feel comfortable with the educational application of Facebook, its use has not made significant inroads into the classroom, and most faculties are not ready to engage it in such a context. Teenagers in the twenty-first century have grown up with information technology; thus, their aptitudes, attitudes, expectations, and learning styles differ from that of the previous generation. They have more choices about how and where to spend their learning time (e.g. in online settings, private, public, or home school options) than their peers did a decade ago. They are more interested in technology that provides various facilities as to make learning and working a pleasurable and fun experience. The characteristics, expectations, and learning styles of these teenagers, net generation, and IT-savvy students are key topics of discussion among educators, who are trying to develop new teaching and learning approaches that can hold the attention of students.

Social networks are an ideal communication tool that can be utilised by educators and students, due to the features and characteristics of these sites, which are attractive. However, most studies conducted in this context focused on the frequency of Facebook use and socialising via Facebook (Cox 2012), and neglect to examine factors affecting students' intention to use Facebook as a learning tool. Glowatz and O'Brien (2013), Deng and Tavares (2013), and Sánchez, Cortijo, and Javed (2014) highlighted the fact that there is a scarcity of research on possible academic usage of Facebook, and more research is needed to deepen our

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understanding of the possibility of using Facebook as an educational tool.

Research confirms that Facebook is a popular social network site among students; it has become a pervasive element in their lives, and therefore has the potential to impact different dimensions of students' lives, including academic performance (Abramson 2011; Kamenetz 2011; Matney and Borland 2009; Smith and Caruso 2010). Facebook could potentially be used as a learning management system (LMS), because the wall of a Facebook group could be used as a platform to place announcements and share information and learning resources (Wang et al. 2012). Facebook is imbued with many desired qualities of an effective education technology, as it is a suitable mechanism for peer feedback and fits the social context of university learning (Selwyn 2007). Despite the popularity and extensive use of Facebook among students, the educational value of Facebook has not been fully quantified (Manca and Ranieri 2013), and few studies have examined students' perceptions about the use of Facebook as an instructional tool for learning.

As of 2014, there were almost 1.35 billion active users of Facebook across the globe, and this figure is expected to increase by 14% annually (Internet World Stats 2015). Malaysia, like many other countries, has been hit by the Facebook phenomenon (with 10.9 million Facebook users in July 2016), and it is among the top five countries in terms of the number of Facebook accounts created. Malaysians aged between 18 and 24 years are the highest user group, contributing 34.5% of users, followed by those aged between 25 and 34 (29.5%) and 13 and 17 (16.3%) years. About 20% of Malaysians spend 4–8 hours on Facebook per day, while 5% spend 8–15 hours per day on Facebook. The most popular activities are social networking and entertainment (Internet World Stats and Statista 2015).

Considering the time spent by the 18–24 years age group on Facebook, it would be interesting to determine whether or not the use of Facebook affects the use of e-learning among Malaysian undergraduate students, who are mostly in this age category. To evaluate students' intention to use e-learning via Facebook and identify factors that affect students' use of e-learning via Facebook, we conducted a survey among undergraduate students. We used the unified theory of acceptance and use of technology (UTAUT2) as a base model, adding perceived playfulness to the model to measure students' curiosity and enjoyment in learning via Facebook, which is an important factor in using social network sites. UTAUT was developed in 2003 by Venkatesh and colleagues to measure employees' acceptance of technology, and many improvements to the model have been made since. Straub (2009) suggested that further validation and replication of the model are needed. Therefore, the UTAUT2 model was developed to explain consumers' acceptance of technology, where Venkatesh, Thong, and Xu (2012) suggested that it is critical to examine how it can be further expanded into other contexts, such as social media or social networks. Therefore, we applied UTAUT2 to the social network (Facebook) context to measure students' use of e-learning via Facebook. This will further extend the UTAUT model in the new context to measure the use of the new technology, in line with Alvesson and Karreman (2007), where the theory can be extended by leveraging it within a new context. Compared to general theories, theories that focus on a specific context are considered to be vital in providing a rich understanding of a focal phenomenon (Venkatesh, Thong, and Xu 2012). Moreover, Hsu, Lin, and Tsai (2014) argued that the utilisation of online services may generate more than one type of benefits to the users; thus, there is a need to decompose the overall concept into different dimensions and re-examine the importance of confirmation from multiple perspectives, which this study aims to do. Furthermore, adding the dimension of playfulness to the UTAUT2 model creates a new knowledge related to other aspects of using technology, such as curiosity and enjoyment, especially ones related to individual voluntary use of social media/networks.

Considering the above arguments from different researchers, we divided the determinants of the intention to use Facebook for e-learning into three dimensions, namely, hedonic values, utilitarian values, and communication values, which affected students' use of e-learning via Facebook. Dividing the determinants of intention to use Facebook for learning into three categories will clarify which aspect of using Facebook is more important for students. This study pursued two main objectives: the first is to examine the effect of hedonic, utilitarian, and communication values on students' intention to use e-learning via Facebook, and the second is to measure the effect of habit and facilitating conditions on students' use of e-learning via Facebook. The effect of gender, age, and experience on the determinants of intention to use e-learning and the use of e-learning via Facebook was explored to provide more information.

The remainder of this paper will be arranged in the following order: Section 2 presents a review of related literature, including research in the fields of information systems, social networks, and e-learning, as well as the literature related to the technology acceptance and the UTAUT2 model. Sections 3–5 describe the research method, data analysis, and results, respectively. Based on the research findings, the main results, together

with the literature, are discussed in Section 6. The work is concluded in Section 7.

2. Background of the study

Using IT for the purpose of learning (Cox 2012) and incorporating online learning platforms into teaching can reduce the limitations associated with classrooms and provide students with more opportunities to connect with one other, which will result in more effective learning (Chen et al. 2011; DeGennaro 2008; Greenhow, Robelia, and Hughes 2009; Lenhart et al. 2008; Lou et al. 2010). E-learning is one of the most popular learning environments in the information age, and is currently receiving enormous attention across the globe (Liaw, Hsiu-Mei Huang, and Chen 2007). E-learning comprises all forms of electronically supported learning and teaching processes (Ismaila et al. 2012). Technologies such as social media, blogs, videos, podcasts, and wikis are valuable tools for teaching, and many researchers argue that social media sites could be valuable tools for learning (Moran, Seaman, and Tinti-kane 2011). E-learning technologies are well-supported by universities and other educational organisations seeking new and innovative ways to educate their students (Šumak, Hericko, and Pušnik 2011). Research shows that interaction between learners and instructors (Yuan and Kim 2014) increases the level of engagement and satisfaction (Jung et al. 2009).

The use of social networks could potentially improve the higher education experience (Roblyer et al. 2010). Social networking features, such as contributing, sharing, consuming, and participating, and its audio-visual functions could enhance the diversity of teaching methods (Yen 2016). The growing use of social networks, especially Facebook, among students, has encouraged some universities to take advantage of the opportunity to motivate students to engage different learning tools, since the effectiveness of educational practices is directly related to student engagement. Facebook has become a pervasive element of students' lives; therefore, it could significantly influence social practices in academia (Hewitt and Forte 2006). Specifically, Facebook generates a platform for informal and unstructured forms of learning, and the collaborative potential of the site can be tapped into for academic purposes (Selwyn 2009). Facebook provides new avenues through which young adults can express themselves and interact with one another (Ainin et al. 2015a; Giannakos et al. 2013; Greenhow 2011). Facebook's use is correlated with learners' sense of increased social belonging, and it is well-established that learners who feel socially connected to their communities perform better academically (Greenhow, Robelia, and Hughes 2009).

Students can use Facebook to exchange knowledge on academic and campus issues. Facebook is a useful site where students can ask questions about coursework or share information pertaining to campus activities (Lampe et al. 2011). It enables learning to continue between classes and beyond the classroom. Researchers have found that the discussions conducted on Facebook are shorter, more casual, spontaneous, and flows freely (Deng and Tavares 2013). Yun, Jiang, and Li (2010) concluded that individuals' social networking and engagement on Facebook have a positive impact on students' learning because Facebook helps students attain acceptance from others and adapt to university culture. Meanwhile, Facebook serves as a platform for instructors to connect, befriend, and communicate with students to extend the communicative activities of the traditional physical classroom onto a virtual platform. These features enhance the quality of the interaction and relationship among students, instructors, and the institution (Wang 2013). Teachers can convey their expectations through Facebook on student projects, course assignments, and class materials. They can post information on Facebook as an attempt to make interpersonal or academic connections with students (Mazer, Murphy, and Simonds 2007). Students enjoy Facebook while benefitting from its other facilities, such as interacting with others and sharing knowledge related to academic courses. Therefore, Facebook can be used as an educational communication and interaction tool that enables faculty members to assume a more active and participatory role (Wang 2013).

Researchers in the technology acceptance discipline have proposed different models to explain technology acceptance. Most of the theories in the field of information systems measure the usefulness and ease of use of technology, and argue that these factors will affect an individual's decision to use new technology. For example, Venkatesh et al. (2003) provided a useful tool for managers to assess the likelihood of success of newly introduced information systems and help them understand the drivers of IS acceptance by individual employees. They proposed the UTAUT model, which is made up of five predictors of IS adoption behaviour, namely, performance expectancy, effort expectancy, social influence, facilitating conditions, and intention to use (of which, the latter two are postulated as the direct determinants of use behaviour). The UTAUT model postulates four variables that moderate the relationships between the five predictors of IS adoption behaviour (i.e. intention to use and actual use), namely, the voluntariness of use, experience with the system, age, and gender. Venkatesh, Thong, and Xu (2012) later added three constructs, namely, hedonic

motivation, price value, and habit, to the UTAUT model, resulting in the UTAUT2 model, which is tailored to model the IS adoption behaviour of consumers. These models were tested multiple times in different contexts to measure the different dimensions of technology adoption and use behaviour. In 2016, Venkatesh and colleagues reviewed the UTAUT literature from September 2003 until December 2014, and organised the existing UTAUT extensions into four types: new exogenous mechanisms, new endogenous mechanisms, new moderation mechanisms, and new outcome mechanisms.

3. Model development

The literature on IT, social networks, and e-learning provide a theoretical basis for studying the intention to use e-learning via Facebook. The present study incorporates the core technology beliefs from UTAUT and UTAUT2 models (namely, performance expectancy, effort expectancy, social influence, hedonic motivation, habit, and facilitating conditions) in the research framework. Considering the characteristics of social media, we also incorporated playfulness as an additional construct to the UTAUT2 model and categorise them into three classes. We categorised the predictors of intention to use as hedonic values (hedonic motivation, playfulness, and effort expectancy), utilitarian values (performance expectancy), and communication values (social influence). The construct of playfulness that was added to the model was adapted from Wang, Wu, and Wang (2009), which measures the students' level of curiosity during their interaction with the e-learning material via Facebook, which makes the UTAUT2 model more effective in measuring social media usage. We did not consider the effects of price value as an independent variable, since we measured students' e-learning via Facebook, rendering the price value irrelevant in this context. In addition, we measured the direct effect of facilitating conditions on usage instead of intention to use, since Venkatesh et al. (2003) argued that when performance expectancy and effort expectancy are present, facilitating conditions become insignificant in predicting intention. The research model tested in this study is shown in Figure 1. As shown in the research model, hedonic motivation, perceived playfulness, effort expectancy, performance expectancy, and social influence were hypothesised to be the determinants of behavioural intention to use e-learning, while habit, intention to use, and facilitating conditions were hypothesised to be predictors of use of e-learning via Facebook. The following sections elaborate upon the development of the hypotheses.

3.1. Hedonic values

3.1.1. Hedonic motivation

Hedonic consumption has been denoted as aspects of behaviour that are closely related to the multisensory, fantasy, and emotive aspects of consumption

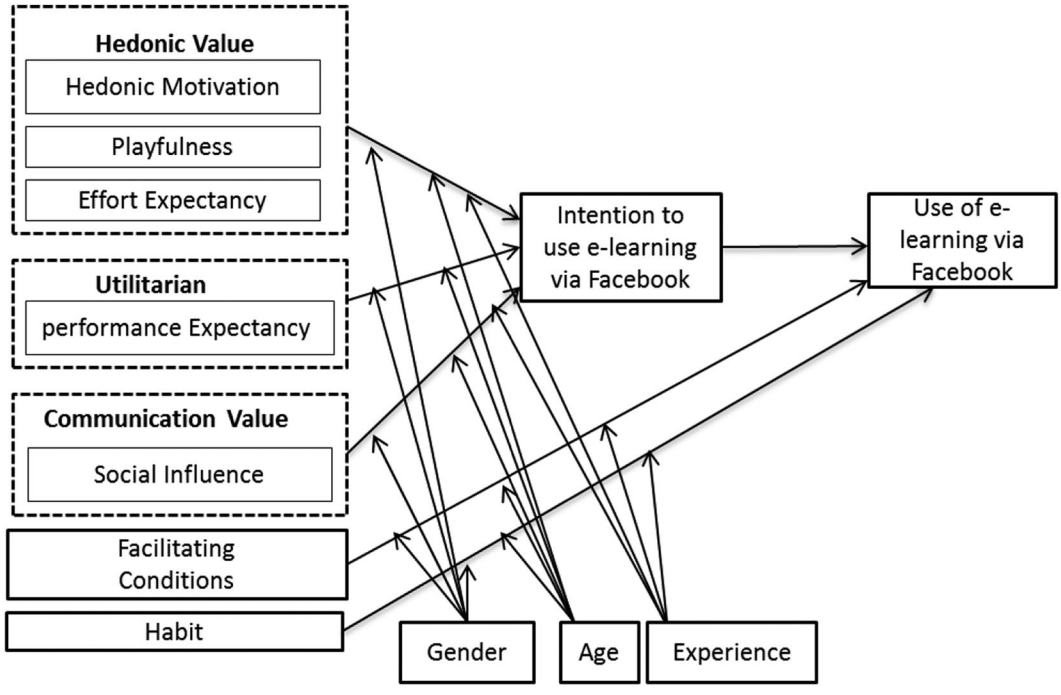

Figure 1. Research model.

(Hirschman and Holbrook 1982). Researchers in the technology acceptance discipline have used motivational factors to investigate individual technology acceptance. They argue that intrinsic motivation can translate to perceived enjoyment, while extrinsic motivation is related to performance expectancy (Davis, Bagozzi, and Warshaw 1992). They suggest that users will use new technology (a) because of performance expectancy (extrinsic motivation), and (b) for pleasurable experience and enjoyment (intrinsic motivation) rather than for performance enhancement (Thong, Hong, and Tam 2006). This shows that individuals normally seek sensations on multiple sensory channels for a pleasurable experience (Van der Heijden 2004). Van der Heijden (2004) divided the use of the system into hedonic and utilitarian values, and argued that users are searching for technologies that satisfy both utilitarian and hedonic values. Van der Heijden (2004) suggested that perceived enjoyment is a strong predictor of behavioural intention. In the information systems context, perceived enjoyment specifies the extent to which fun can be derived from using a system. In another study, Venkatesh, Thong, and Xu (2012) defined hedonic motivation as the fun or pleasure derived from using a technology and argued that it has an important role in determining technology acceptance and use. Hedonic motivation can be an important factor in the context of social network, since social networks attract extensive use from many people. Sledgianowski and Kulviwat (2008) and Hu, Poston, and Kettinger (2011) postulated that social networks are considered hedonic-oriented information technologies, while Alarcón-Del-Amo, Lorenzo-Romero, and Gómez-Borja (2012) presumed that social network sites are utilitarian technologies. Boyd and Ellison (2007) and Thambusamy et al. (2010) pointed out that users of social networks usually enjoy surfing in general, and they tend to experience happiness, which is derived from social interactions; thus, it is presumed that social network services and hedonic information systems are strongly correlated. Conceptualising the previous findings into the context of the current research, hedonic motivation is categorised under hedonic value and is defined as the degree to which students feel pleasure when they use e-learning via Facebook. This study added hedonic motivation as a predictor of students' intention to use e-learning via Facebook, and hypothesised that:

H1: Hedonic motivation has a positive effect on students' intention to use e-learning via Facebook.

Holbrook and Hirschman (1982) argued that novelty seeking in the beginning of using a new technology can add to the hedonic motivation to use any product. Venkatesh, Thong, and Xu (2012) indicated that hedonic motivation will play a less important role in determining technology use with increasing experience. Highly experienced users will use technology to increase efficiency and effectiveness, although the attractiveness of the technology will eventually diminish over time. Younger males tend to exhibit a greater tendency to seek novelty and innovativeness during the early stages of using a new technology (Venkatesh, Thong, and Xu 2012), which increases the relative importance of hedonic motivation in younger males' early technology use decision. Considering previous researches, we hypothesised that the effect of hedonic motivation on students' intention to use e-learning via Facebook is different among male and female students based on their respective age and experience.

H1 (a): The influence of hedonic motivation on students' intention to use e-learning via Facebook will be moderated by gender, age, and experience.

3.1.2. Perceived playfulness

Perceived playfulness is defined as an intrinsic motivator towards technology acceptance (Chou 2006). Wang, Wu, and Wang (2009) described playfulness as a state of mind and an individual trait. They argued that a trait is a comparatively stable characteristic of an individual, which is invariant to situational stimuli. The state of mind refers to effective or cognitive episodes experienced in the short run. In the context of IT, the trait-based approach emphasises playfulness as an individual characteristic, while the state-based approach focuses on playfulness as the individual's subjective experience of human–computer interactions (Moon and Kim 2001). Researchers such as Moon and Kim (2001) reported the positive effects of playfulness on the intention to use the web, and argued that individuals who experienced pleasure from using an information system are more likely to use it. Wang, Wu, and Wang (2009) measured the effect of playfulness on students' use of mobile learning, with their results showing that perceived playfulness has a significant effect on students' intention to use mobile learning. Wang, Wu, and Wang (2009) found that perceived playfulness had a significant effect on behavioural intention, as far as massive multiplayer online games (MMOGs) are concerned. This denotes the fact that users who possess higher levels of perceived playfulness towards MMOGs will tend to have a higher level of behavioural intention to play MMOGs. Taking into account the findings by Moon and Kim (2001) and Wang, Wu, and Wang (2009), perceived playfulness in this study is defined as a state of mind that includes two dimensions: concentration and curiosity. The former is the extent of students' level of

attention in their interaction with the e-learning material on Facebook, while the latter is the extent of students' curiosity during their interaction with the e-learning material on Facebook. This study categories playfulness under hedonic value and measures the effect of playfulness on students' intention to use e-learning via Facebook and hypothesised that:

H2: Perceived playfulness has a positive effect on students' intention to use e-learning via Facebook.

Venkatesh (1999) suggested that system experience influences an individual user's playfulness with the system. When users first interact with the system, they feel intimidated; therefore, their degree of playfulness is low (McCarroll 1991). Other researchers argued that the effect of playfulness differs by gender. There are a few researches that investigate perceived playfulness of the different age groups. For example, Terzis and Economides (2011) suggested that both males and females use web-based systems if it is playful and its content is clear and relative to the course, while Papastergiou and Solomonidou (2005) suggested that males use the Internet for entertainment and creating web pages more than females. Taking into account these arguments, we hypothesised that perceived playfulness differs in terms of age, gender, and experience. Therefore, we hypothesised that:

H2 (a): The influence of perceived playfulness on students' intention to use e-learning via Facebook will be moderated by gender, age, and experience.

3.1.3. Effort expectancy

In the technology acceptance model, Davis (1989) defined the ease of use as the degree to which a person believes that 'using a particular system would be free of effort' (320). Later Venkatesh et al. (2003) conceptualised ease of use as effort expectancy and defined it as the degree of ease associated with the use of a system. Venkatesh et al. (2003) argued that effort expectancy is significant in both the voluntary and mandatory usage contexts only during the first time period, and becomes non-significant over periods of extended usage. However, users' intention will increase if they perceive that a particular technology is easy to use, which will lead to higher intention to use the system by users (He and Lu 2007). Kijsanayotin, Pannarunothai, and Speedie (2009) emphasised the significant effect of effort expectancy on individuals' intention to use new technologies. In the mobile learning context, Wang et al. (2010) indicated the significant effect of effort expectancy on individuals' intention to use mobile learning. Van der Heijden (2004) highlighted the influence of ease of use on individuals' use of a new technology, which is regarded to be a hedonic dimension of using technology. With this rationale, we considered effort expectancy under the hedonic value of using Facebook, and hypothesised that:

H3: Effort expectancy has a positive effect on students' intention to use e-learning via Facebook.

As argued by the previous research, effort expectancy is more salient in the early stage of use, and becomes insignificant with periods of extended usage, when individuals learn to effectively operate a new technology (Venkatesh et al. 2003). According to Venkatesh et al. (2003), effort expectancy is more salient in females compared to males, as well as in older individuals with relatively little experience with a new technology. Therefore, we hypothesised that:

H3 (a): The influence of effort expectancy on students' intention to use e-learning via Facebook will be moderated by gender, age, and experience.

3.2. Utilitarian values

3.2.1. Performance expectancy

Performance expectancy is referred to as the degree to which a person believes that using a specific system will help him or her attain gains in job performance (Venkatesh, Thong, and Xu 2012). Venkatesh et al. (2003) introduced performance expectancy as the strongest predictor of behavioural intention, and argued that this construct remains significant at all points of measurement. Van der Heijden (2004) considered performance expectancy as a utilitarian dimension, and argued that the utilitarian aspect of a technology aims to provide instrumental value to the user. The utilitarian dimension of a technology increases users' task performance while encouraging efficiency. Raacke and Bonds-Raacke (2008), Bonds-Raacke and Raacke (2010), and Subrahmanyam et al. (2008) denoted that social network service components provide users with external benefits, such as the capability to organise events and placing reminders for importance events. Simultaneously, Alarcón-Del-Amo, Lorenzo-Romero, and Gómez-Borja (2012) identified a strong influence of perceived usefulness on the behavioural intention to use social networks. Based on previous research, we hypothesised that performance expectancy will affect students' use of e-learning via Facebook; thus:

H4: Performance expectancy has a positive effect on students' intention to use e-learning via Facebook.

Venkatesh et al. (2003) argued that the relationship between performance expectancy and behavioural

intention is moderated by gender and age, whereby the effect is stronger in males than females, as males are more task-oriented. The impact of performance expectancy on behavioural intention is greater for younger individuals, to whom extrinsic reward is more important (Morris and Venkatesh 2000; Venkatesh et al. 2003). Considering the above literature, we hypothesised that:

H4 (a): The influence of performance expectancy on students' intention to use e-learning via Facebook will be moderated by gender and age.

3.3. Communication values

3.3.1. Social influence

Social influence in the UTAUT model is defined as the degree to which individuals perceive that it is important that others believe they should use a new system (Venkatesh et al. 2003). Thompson, Higgins, and Howell (1991, 126) defined social influence as social factors, and described social influence as 'the individual's internalisation of the reference groups' subjective culture, and specific interpersonal agreements that the person has formed with others, in specific social situations'. On the other hand, Shen et al. (2006) defined social influence as the pressure that students experience to utilise innovation from instructors or other students in the learning context, and explained that compliance with the requirements of others, conformity to the expectations of others, and identification with the way in which others work are potentially key elements in determining educational activity, including the usage of online learning systems. Social influence has been referred to by different terms, such as social factors, subjective norms, or social norms, in different theories (Chen 2014; Mazman, Usluel, and Çevik 2009). Communication among friends helps shape individuals' estimation of their confidence in using a system and will impact their intention to use the system (Lu, Yao, and Yu 2005). The present study categorised the social effect of friends and family under communication value and hypothesised that:

H5: Social influence has a positive effect on students' intention to use e-learning via Facebook.

The effect of social influence varies between different ages, genders, and levels of experience, and is more salient in females when forming the intention to use a new technology, since females tend to be more sensitive to the opinion of others, although the effect will decline with increased experience (Venkatesh et al. 2003). The effect of social influence is strongest for older females during the early stages of experience (Venkatesh et al. 2003). With this rationale, we hypothesised that:

H5 (a): The influence of social influence on students' intention to use e-learning via Facebook will be moderated by gender, age, and experience.

3.4. Intention to use

Intention is derived from the constructs adapted from Davis, Bagozzi, and Warshaw (1989), who defined behavioural intention as a measure of the strength of individuals' intention to perform a specified behaviour. Behavioural intention measures how individuals are willing to try and exert effort in order to perform the use behaviour. Davis (1989) hypothesised that behavioural intention to use a system influences actual use. When intention becomes stronger, individuals are more likely to perform use behaviour (Moghavvemi et al. 2015; Venkatesh et al. 2003). Thus, we hypothesised that:

H6: Intention to use has a positive effect on students' use of e-learning via Facebook.

3.5. Facilitating conditions

Facilitating conditions are defined as the degree to which individuals believe that appropriate organisational and technical infrastructure exists to support the use of a system (Venkatesh et al. 2003). The literature shows that facilitating conditions have a significant effect on the infusion or adoption of new information system innovations (Sheng, Hsu, and Wu 2011). The concept of facilitating conditions was established in the model of PC utilisation, where it was defined as the 'objective factors in the surroundings that observers agree make an act is easy to accomplish' (Thompson, Higgins, and Howell 1991, 129). When a new user lacks the sufficient skill to use a new technology, the facilitating conditions, such as technical instruction, user guidance, and personal assistance, are rendered important. Taking into account the approach by Venkatesh et al. (2003, 2012) in the UTAUT and UTAUT2 models, we assumed that facilitating conditions will affect students' use of e-learning via Facebook, and hypothesised that:

H7: Facilitating conditions have a positive effect on students' use of e-learning via Facebook.

The relationship between facilitating conditions and use behaviour is moderated by age, gender, and experience, whereby the effect is more pronounced for older individuals (Morris and Venkatesh 2000; Venkatesh et al. 2003), since it is more difficult for them to process new or complex information when learning a new technology (Venkatesh, Thong, and Xu 2012). Moreover, 'males are willing to exert more effort in overcoming difficulties to pursue their goals compared to females', as mentioned by Venkatesh,

Thong, and Xu (2012, 162). Females tend to focus more on the magnitude of effort involved and the process itself in achieving their objectives (Venkatesh, Thong, and Xu 2012). Men rely less on facilitating conditions when considering the use of a new technology compared to women, who need more external support (Venkatesh and Morris 2000). Thus, we hypothesised that:

> H7 (a): The influence of facilitating conditions on students' use of e-learning via Facebook will be moderated by gender, age, and experience.

3.6. Habit

Venkatesh, Thong, and Xu (2012) defined habit 'as the extent to which people tend to perform behaviour automatically because of learning' (161). Researchers have conceptualised habit as prior behaviour and the extent to which an individual believes the behaviour is automatic (Kim and Malhotra 2005). Ortiz de Guinea and Markus (2009) described habit as the extent to which an individual tends to perform behaviours (e.g. use IT) automatically because there is an opportunity to learn, whereby repeated behavioural successions are automatically triggered by prompts from the environment. This definition implies that conscious intention to continue to use deteriorates when IS use behaviour becomes habitual (Limayem, Hirt, and Cheung 2007). When IS use becomes habitual, it is no longer considered a conscious decision about whether or not to continue its use (Clements and Bush 2011). In the beginning stage of the technology adoption, people will be more involved in active cognitive processing in conceptualising their intentions to adopt the technology (repeated performance of a behaviour can result in well-established attitude and intentions); but when a person practices repetitive behaviour after the adoption of the technology, reflective cognitive processing diminishes over time, leading to non-reflective and routinised behaviour (repeated performance of a behaviour produces habituation and behaviour) (Ouellette and Wood 1998). Wu, Tao, and Yang (2008) found that frequency of past usage and habitual usage significantly affect IS continuance intention. Venkatesh, Thong, and Xu (2012) examined the effects of habit on the use behaviour, and found that habit has a significant effect on consumers' use of technology; thus, we hypothesised that:

> **H8**: Habit has a positive effect on students' use of e-learning via Facebook.

Venkatesh, Thong, and Xu (2012) argued that the effect of habit is different among people of different ages and genders with different experiences. Previous research indicated that when a person practises repeated behaviour, it will be routinised. For example, consumers with more experience of using a specific technology will develop a cognitive lock that creates a barrier to behavioural changes (Murray and Habul 2007). This shows the influence of previous experience on behaviour. Moreover, the way people process information varies based on age and gender: older people tend to rely more on automatic information processing with their habits, which prevents and suppresses new learning, and females tend to pay more attention to details and process information in a piece-meal manner compared to males. Therefore, the effect of habit will be stronger among older males (Venkatesh, Thong, and Xu 2012). Considering this, we hypothesised that:

> H8 (a): The influence of habit on students' use of e-learning via Facebook will be moderated by gender, age, and experience.

3.7. Use behaviour

There are three general concepts of system use, which are frequency of use, duration of use, and intensity of use (Davis 1989; Venkatesh et al. 2008). Most IS adoption behaviour research defines system use within the concepts of frequency, duration, and intensity of individuals' interaction with a particular system (Ainin et al. 2015b; Venkatesh et al. 2008). We measured the frequency of use of e-learning via Facebook.

4. Method

4.1. Participants and procedure

The sampling frame in the present study comprised 170 undergraduate students (all of whom had a Facebook account and were familiar with e-learning) enrolled in a business statistics course at the University of Malaya (UM), Malaysia. The data were collected in two stages: at the beginning and at the end of the semester. We collected data related to the utilitarian values, hedonic values, communication values, facilitating conditions, habit, intention to use, and use of e-learning via Facebook to measure the use of e-learning via Facebook and the determinants of intention to use. At the beginning of the semester, the lecturer created a business statistics Facebook group and uploaded videos, text, e-books, and notes to facilitate the use of e-learning material by the students. Facebook was used for two purposes: facilitating communication between students and the lecturer, and creating a reliable source for students to find course-related information on Facebook to facilitate learning. The lecturer made an announcement about the Facebook group and made it optional for students to become a member. The same materials and

documents were also uploaded in the university spectrum (Student Powered e-Collection Transforming University of Malaya), which is accessible to all students. Initially, the students did not have a clear idea of how Facebook could be used for learning. Within a week, most of the students requested to be added as a member of the Facebook group. After each teaching session, the lecturer uploaded related videos, notes, e-books, and PowerPoint slides to the Facebook group. After a few weeks, they found it interesting, and some students who were not enrolled in the statistics class also requested to become a member of the Facebook group. The number of 'seens' and 'likes' showed that the students watched the videos or used the uploaded e-learning materials. Students started asking questions in the Facebook group, and sometimes uploaded relevant videos, while at other times they answered other students' questions. Some students started sharing materials, such as exam question samples and assignments, via the Facebook group. The first stage of data collection commenced after the first two weeks of the semester, and measured the students' intention to use the e-learning material uploaded to the Facebook group and their current use. The second stage of data collection took place at the end of the semester, and measured the determinants of the intention and use of e-learning via Facebook. All the students who were enrolled in the course answered the questionnaire at the beginning and at the end of the semester. Of all these respondents, 100 were females and 70 were males. The average age of the respondents was 22 years.

4.2. Measurement

Appendix 1 shows the list of scales and their original sources. We used previously validated scales and adapted them to the context of Facebook and e-learning. We adapted the measurements for performance expectancy, effort expectancy, social influence, facilitating conditions, and intention to use from Venkatesh et al. (2003) and Davis, Bagozzi, and Warshaw (1989). The scales for habit and hedonic motivation were adapted from Venkatesh, Thong, and Xu (2012) and conceptualised to fit the context of this study. Perceived playfulness was adapted from Wang, Wu, and Wang (2009). These items were measured using a seven-point Likert scale, ranging from 1 (strongly agree) to 7 (strongly disagree), thus requiring the respondents to rate their expectations about the intention to use and the actual use of e-learning via Facebook.

5. Results

In the first stage of the data analysis, we ran the data that were collected at the beginning of the semester. The reliability test shows that all the variables have high internal consistency (value more than 0.7). Both the measurement and structural models were examined using the Amos 16.0 software programme through structural equation modelling. The results of the confirmatory factor analysis show that the data fit to the measurement model and the value of fit indices were within the acceptable range, with $\chi 2 = 653.801$, p-value < .000, CMIN/DF = 1.412, DF = 463, GFI = 0.828, CFI = 0.965, TLI = 0.960, IFI = 0.965, NFI = 0.891, RMSEA = 0.050. To test the relationship between the variables, the structural model being tested and the results showed that the relationship between performance expectancy ($\beta = 0.585$, $p < .000$), playfulness ($\beta = 0.213$, $p < .002$), and social influence ($\beta = 0.122$, $p < .019$), and intention to use ($\beta = 0.447$, $p < .017$) was significant, while the relationship between effort expectancy ($\beta = -0.009$, $p < .907$) and hedonic motivation ($\beta = 0.114$, $p < .145$) was not significant. Facilitating condition ($\beta = 0.198$, $p < .286$) and habit ($\beta = 0.227$, $p < .223$) were not significant predictors of the use of e-learning via Facebook. This was expected, since at the beginning of the semester, the students did not have a clear idea of e-learning via Facebook, and the instructor has yet to create a Facebook group. The second set of the data was collected at the end of the semester after few months of using e-learning via Facebook to measure the use of e-learning via Facebook. We ran the reliability analysis (see Appendix 1) and confirmatory factor analysis to confirm the adequacy of the underlying variables in the new context. The discriminant and convergent validity of the data sets were examined through the composite reliability and average variance extracted (AVE) (see Table 1). The results of the measurement model indicated that, for all constructs, the standardised parameter estimations were higher than 0.70, while the composite reliabilities exceeded 0.80. This supports the assumption of internal consistency and reliability of the measurement model (see Appendix 1). For all constructs, the standardised parameter estimations were higher than 0.70, while the composite reliabilities for most of the constructs exceeded 0.80. Convergent validity was also assessed using the AVE. The AVE for all constructs was greater than 0.60. The square root of AVE was higher than the correlation among the variables (see Table 1). These results proved that convergent validity for all constructs had been achieved for the measurement model (Fornell and Larcker 1981).

The results of the measurement models showed that the data fitted the models well; therefore, we ran the structural model. The results of the structural model were acceptable, with $\chi 2 = 995.533$, Df = 595 p-value < .000, CMIN/DF = 1.673, GFI = 0.774, CFI = 0.922,

Table 1. Correlations, composite reliability, and AVE (end of the semester).

	AVE	CR	1	2	3	4	5	6	7	8	9
Hedonic Motivation	0.851	0.910	**0.922**								
Playfulness	0.748	0.839	0.603**	**0.864**							
Effort Expectancy	0.816	0.888	0.688**	0.386**	**0.903**						
Performance Expectancy	0.803	0.901	0.721**	0.543**	0.633**	**0.896**					
Social Influence	0.893	0.865	0.607**	0.585**	0.526**	0.656**	**0.944**				
Intention to Use	0.797	0.913	0.674**	0.626**	0.603**	0.668**	0.654**	**0.892**			
Habit	0.818	0.887	0.686**	0.633**	0.571**	0.642**	0.669**	0.634**	**0.904**		
Facilitating Conditions	0.763	0.752	0.660**	0.601**	0.534**	0.614**	0.625**	0.546**	0.716**	**0.873**	
Use Behaviour	0.673	0.662	0.271**	0.220**	0.145**	0.300**	0.254**	0.305**	0.283**	0.209**	**0.832**

Notes: Value on diagonal are square root of AVE. CR = Composite reliability. AVE = Average variance extracted. **$p < .01$.

TLI = 0.913, IFI = 0.923, NFI = 0.810, RMSEA = 0.059. The highest impact was that of playfulness ($\beta = 0.433$) and hedonic motivation ($\beta = 0.222$) on the intention to use and the effect of intention to use on use behaviour ($\beta = 0.50$), followed by performance expectancy ($\beta = 0.202$) and social influence ($\beta = 0.186$). The relationship between effort expectancy ($\beta = 0.063$) and intention to use was not significant, thus rejecting the hypothesis (see Table 2). This suggests that ease of use is not an important factor in students' use of e-learning via Facebook, while other factors, such as hedonic motivation, playfulness, performance expectancy, and social influence, had a significant effect on their intention to use e-learning via Facebook. Habit ($\beta = 0.368$) and facilitating conditions ($\beta = 0.372$) were strong predictors of the use of e-learning via Facebook.

Hedonic motivation, playfulness, effort expectancy, performance expectancy, social influence, facilitating condition, and habitual use explained 68% of the variance of students' intention to use e-learning via Facebook. Habit, facilitating conditions, and intention to use had a significant effect on students' use of e-learning via Facebook. These three factors explained 41% of the variance in using e-learning via Facebook among students.

Comparing the results of the first stage (beginning of the semester) and the final stage (end of the semester) led us to conclude that the effect of hedonic motivation, playfulness, and social influence on the intention to use e-learning via Facebook increased during that time period (Figure 2 depicts the results of the two stages). This suggests that in the beginning of the semester, students may perceive that using e-learning via Facebook will only affect their academic performance, because they will obtain more knowledge, while they did not think that using e-learning via Facebook can be fun and attractive, or maybe in the beginning of the semester, they lack a clear idea of e-learning via Facebook. However, at the end of the semester, when they experienced using e-learning via Facebook, their perception changed, and they realised that using e-learning via Facebook is attractive and enjoyable. The effect of facilitating conditions and habit on the use of e-learning via Facebook increased, which shows the importance of providing facilities for students to use e-learning. When the lecturer created the Facebook group and provided the materials, the students came to realise the other purpose of using Facebook, and ended up spending more time using it.

5.1. Moderation effect of age, gender, and experience

We examined the effect of gender, age, and experience in order to explore if these factors have (any) effect on the use of e-learning via Facebook (Table 3). For each moderating factor (age, gender, and experience), the data are divided into two groups and run through a multi-group analysis in Amos (Moghavvemi and Mohd Salleh 2014). The Chi-square differences between the constrained and unconstrained models, based on age, gender, and experience, support the moderating effects. Examining the moderating effect of experience on the hypothesised relationship shows that the impact of social influence on intention to use was different among students who are highly experienced with e-learning and those who lack experience (see Table 3). The effect of hedonic

Table 2. Estimating research parameters (end of the semester).

Hypothesis	Path	Standardised coefficient	C. R.	*p*-Value	Result
H_1	Hedonic Motivation → Intention to Use	0.22	2.210	<.02	Supported
H_2	Playfulness → Intention to Use	0.31	3.265	<.001	Supported
H_3	Effort Expectancy → Intention to Use	0.06	0.528	.59	Not Supported
H_4	Performance Expectancy → Intention to Use	0.20	1.799	<.05	Supported
H_5	Social Influence → Intention to Use	0.18	1.995	<.05	Supported
H_6	Intention to Use → Use Behaviour	0.50	3.348	<.00	Supported
H_7	Facilitating Conditions → Use Behaviour	0.37	2.174	<.03	Supported
H_8	Habit → Use Behaviour	0.36	1.943	<.04	Supported

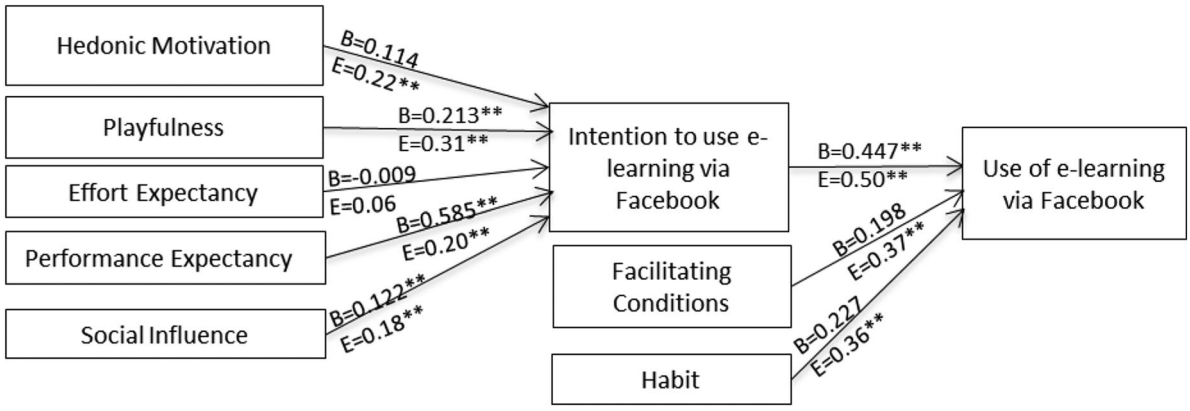

Figure 2. Comparing the results from the beginning and the end of the semester.

Table 3. Moderating effect of age, gender, and experience (end of the semester).

	Hypotheses	*β*	C.R.	*P*
	Age 20 years and below			
H1a	Hedonic Motivation → Intention to Use	0.075	0.930	0.352
H2a	Playfulness → Intention to Use	0.168	2.142	0.032*
H3a	Effort Expectancy → Intention to Use	0.015	0.178	0.859
H4a	Performance Expectancy → Intention to Use	0.645	7.093	0.000***
H5a	Social Influence → Intention to Use	0.152	2.517	0.012**
H7a	Habit → Use Behaviour	0.304	1.432	0.152
H8a	Facilitating Conditions → Use Behaviour	0.266	1.274	0.203
	Age more than 20 years			
H1a	Hedonic Motivation → Intention to Use	0.848	2.471	0.013**
H2a	Playfulness → Intention to Use	0.483	3.092	0.002**
H3a	Effort Expectancy → Intention to Use	0.413	1.506	0.132
H4a	Performance Expectancy → Intention to Use	0.142	0.661	0.509
H5a	Social Influence → Intention to Use	0.126	1.064	0.287
H7a	Habit → Use Behaviour	0.280	0.722	0.470
H8a	Facilitating Conditions → Use Behaviour	0.251	0.632	0.528
	Male			
H1a	Hedonic Motivation → Intention to Use	0.156	1.393	0.164
H2a	Playfulness → Intention to Use	0.230	2.223	0.026*
H3a	Effort Expectancy → Intention to Use	0.010	0.110	0.912
H4a	Performance Expectancy → Intention to Use	0.687	6.008	0.000***
H5a	Social Influence → Intention to Use	0.072	0.876	0.381
H7a	Habit → Use Behaviour	0.358	1.310	0.190
H8a	Facilitating Conditions → Use Behaviour	0.101	0.405	0.686
	Female			
H1a	Hedonic Motivation → Intention to Use	0.017	0.136	0.892
H2a	Playfulness → Intention to Use	0.248	2.254	0.024*
H3a	Effort Expectancy → Intention to Use	0.039	0.251	0.802
H4a	Performance Expectancy → Intention to Use	0.482	3.967	0.000**
H5a	Social Influence → Intention to Use	0.128	1.804	0.071
H7a	Habit → Use Behaviour	0.181	0.693	0.488
H8a	Facilitating Conditions → Use Behaviour	0.445	1.546	0.122
	High Experience (<3 years)			
H1a	Hedonic Motivation → Intention to Use	0.060	0.579	0.563
H2a	Playfulness → Intention to Use	0.182	1.791	0.73
H3a	Effort Expectancy → Intention to Use	0.034	0.295	0.768
H5a	Social Influence → Intention to Use	0.091	1.153	0.249
H7a	Habit → Use Behaviour	0.215	0.759	0.448
H8a	Facilitating Conditions → Use Behaviour	0.194	0.782	0.434
	Less Experience (≥3 years)			
H1a	Hedonic Motivation → Intention to Use	0.147	1.299	0.194
H2a	Playfulness → Intention to Use	0.224	2.309	0.21
H3a	Effort Expectancy → Intention to Use	0.006	0.056	0.955
H5a	Social Influence → Intention to Use	0.149	2.069	0.039*
H7a	Habit → Use Behaviour	0.137	0.544	0.586
H8a	Facilitating Conditions → Use Behaviour	0.045	0.162	0.871

*$p < .05$.
**$p < .01$.
***$p < .001$.

motivation and playfulness was stronger among the less experienced, while the effect of habit and facilitating conditions was stronger among the highly experienced students.

Examining the effect of gender indicated that the effect of hedonic motivation and performance expectancy is stronger for males, since they have the tendency to seek novelty and new technology. They are curious to find new ways of doing things or find new technology to use. The effect of performance expectancy and habit was strong among men, which may reflect their higher preoccupation with improving academic performance and their tendency to increase their use of computers or spend more time for e-learning via Facebook. The stronger effect of social influence among females reflects their tendency to listen to the advice of friends or lecturers to use new technologies. In addition, females were more concerned about the existence of support and facilitating conditions to use e-learning via Facebook.

Age moderates the relationship between hedonic motivation and performance expectancy, where the results of the hedonic motivation was stronger in older students (aged more than 20 years). This suggests that pleasurable experience is more important for older students compared to younger ones, who are more concerned about performance. Older students are more satisfied in using e-learning via Facebook, as it is enjoyable and fun for them. This is consistent with the effect of playfulness, which is stronger in older students, indicating that they used e-learning through Facebook as it leads to their exploration and curiosity, and the process is enjoyable for them to the extent that they lost track of time when using it. The effect of performance expectancy was stronger for younger students, which suggests that the most important factor for younger students is improving their academic performance, and they intend to use technology if they actively benefit from it. The effect of social influence and the existence of facilitating conditions was stronger among younger students, which shows that they need more support and facilities as opposed to the older students.

6. Discussion

This study aims to validate and extend the UTAUT2 model in the context of social media and identify the different dimensions of e-learning adoption and utilisation of Facebook for learning. The results revealed that playfulness strengthens the UTAUT2 model in measuring the use of social media, especially Facebook. This is because using social media is more enjoyable and attractive compared to using other online technologies, and users prioritise hedonic aspect and playfulness of using a technology compared to the ease of use and performance expectancy.

The research model posits five direct determinants of intention to use e-learning via Facebook (hedonic motivation, playfulness, effort expectancy, performance expectancy, and social influence), and three direct determinants of the use of e-learning via Facebook (facilitating conditions, habit, and intention to use). The findings suggest that hedonic motivation and perceived playfulness are the strongest influencing factors towards the intention to use e-learning via Facebook. It suggests that e-learning via Facebook is interesting for students and attracts their attention while they experience pleasure. Previously, students used Facebook to connect with friends and satisfy their hedonic needs, and they used other websites related to e-learning to satisfy their course-related purposes. Now, they are using the same platform (i.e. Facebook) to fulfil both needs. This finding is supported by Van der Heijden (2004), who indicated that individuals are interested in having a pleasurable experience when they are using new technologies, which is consistent with Ernst, Pfeiffer, and Rothlauf (2013), who explained that a social network site is regarded to be either a hedonic or a utilitarian information technology, and that these two factors blend well together such that they could be considered dual information technologies.

Performance expectancy is the third important factor that affects students' intention to use e-learning via Facebook. Students considered the benefit gained from using Facebook for learning, as well as the effect on academic performance. The findings showed that they watched videos and used other materials, such as PowerPoint slides, notes, and e-books, to improve learning. Although having fun and pleasure was a priority for them, they used the e-learning materials on Facebook to improve their academic knowledge. In contrast to perceived playfulness and hedonic motivation, performance expectancy is an extrinsic factor that influences student's intention to use e-learning via Facebook. For example, if students expect that they gain measurable benefits (increase academic performance, gain new knowledge, share information with classmate and lecturer, discuss group work, get updates about the course, discuss events, and share exam notes), they will be motivated to use e-learning via Facebook. The importance of performance expectancy is consistent with the findings of most prior research that performance expectancy has a significant impact on the intention to use a new technology (Venkatesh, Thong, and Xu 2012). This finding is consistent with Wang et al. (2010), where they reported a significant and positive effect of performance expectancy on

individual intention to use mobile learning, while Wang and Shih (2009) indicated that performance expectancy has a significant positive influence on behavioural intention to use information Kiosks. The results highlighted the influence of performance expectancy on individual decision-making to use a new technology.

Communication value (social influence) was an important aspect for the students, since they were in the Facebook group, and their friends and teacher encouraged them to use the e-learning material uploaded on Facebook. This suggests that encouragement from friends is important even after they start using new technologies. There is a possibility that at some stages, advice from friends or the lecturer on the benefit or advantages of using a technology will influence the students. Therefore, the lecturer attempted to build positive relationships with the students, and, at the end of the semester, most of the students felt closer to the lecturer. Previous research shows that students who accessed their teacher's Facebook page may feel more comfortable communicating in the classroom, and would approach the teacher with course-related questions and concerns, which may in turn have a positive influence on important learning outcomes (Mazer, Murphy, and Simonds 2007). In addition, it will be easier for lecturers to talk to students with whom they interact daily on Facebook. When it comes to online collaborative learning environments, students who tend to express interest, efforts, success, and the presence of their peers tend to behave in a similar manner. The results agree with Wang et al. (2010), who argued that social influence has a significant influence on teachers' intention to use distance learning.

Effort expectancy had no significant effect on students' intention to use e-learning via Facebook. This result may suggest that using social network sites, especially Facebook, is not new for students, since they are familiar with the system; therefore, the ease or difficulty of using the system will not affect them. Another explanation is that effort expectancy has become insignificant due to the fact that most Facebook applications are relatively easy to use and user-friendly; therefore, using e-learning in Facebook is not going to be a challenge for the students. This finding is inconsistent with the technology acceptance research, especially the UTAUT model, which argued that effort expectancy has significant effects on the intention to use a new technology. However, the result is consistent with Yuen et al. (2010), who posited that there was no significant relationship between effort expectancy and intention to adopt an Internet banking service.

The findings of the current study showed that facilitating conditions, habit, and intention have a significant effect on the use of e-learning via Facebook. Habit is a strong determinant of the use of e-learning via Facebook in the end of the semester, while it was not significant in the beginning, which highlights the automatic use of Facebook among students. This supports the arguments of Ouellette and Wood (1998), where in the beginning, when people want to adopt and use a new technology, they will be more involved in the active cognitive processing of conceptualising their intentions to adopt and use the new technology; but when the action is repeated many times, the reflective cognitive processing diminishes over time, leading to non-reflective and routinised behaviour. It also suggests that using Facebook for the purpose of learning would be effective, since students will log into their Facebook account on a daily basis based on habit, and therefore, they would use the learning materials uploaded on Facebook, which may need active cognitive processing, while after checking the e-learning material via Facebook, it will be a habit. This is consistent with the outcome of Venkatesh, Thong, and Xu (2012).

The presence of conditions to facilitate the use of e-learning via Facebook was a significant factor for students. This finding reveals that once students realise that there are adequate, appropriate, and up-to-date resources and materials related to their course available on Facebook, they will commit to its use. We can consider creating Facebook groups and uploading all related notes, videos, and e-books as part of the facilitating conditions for students, since these steps provide some resources and support students to use Facebook for learning, and make the process of searching for sources and materials on Facebook easier. This indicates that if a university provides facilities for students, the students would use Facebook for learning, which will improve their subsequent academic performance. This is consistent with Wang and Shih (2009), who indicated that if information kiosk planners provide citizens with the required facilities to use the kiosks, they will in fact use it. The importance of facilitating conditions to predict use behaviour is consistent with the basic UTAUT model, as posited by Venkatesh, Thong, and Xu (2012).

The relationship between intention and use is significant, which shows that there is a positive relationship between students' intention to use and use of e-learning via Facebook. It shows that students have a strong intention to use Facebook for learning. The finding shows that students are interested in using social network sites because it satisfies their hedonic and utilitarian and communication needs (such as having fun, connecting with friends, interacting informally with the lecturer and other students, experiencing pleasure, and using e-learning to improve academic performance). They are interested in having different facilities and options available

in the same place to use e-learning via Facebook. Therefore, providing these facilities will influence students' use of e-learning via Facebook, which will subsequently increase their academic performance, as posited by Moghavvemi et al. (2015), indicating that there is a strong relationship between intention to use a technology and the use of the new technology.

Analysing the moderating effect of gender, age, and experience on the relationship between independent and dependent variables showed that the effect of the factors on the intention to use and use of e-learning via Facebook among experienced and non-experienced male and female students of different ages differed, which is consistent with Venkatesh et al.'s (2003, 2012) UTAUT and UTAUT2 models. The results indicated that hedonic motivation and perceived playfulness were stronger among students with less experience, which suggests that they are open to using new technology and trying a new way of learning. They are interested in gaining more experience, and this process is more enjoyable and fun for them. This suggests that using a social network is easy, and users will not feel intimidated and stressful, even in the first interaction with the system; therefore, their degree of playfulness and enjoyment is high, which differs from McCarroll (1991). This shows that the usage of a social network (Facebook) and the factors that affect users differ from that of other technologies and systems.

The strong influence of social influence among the less experienced students indicated that friends' and lecturers' perception and their respective advices are more important for students who had less experience compared to more experienced students. This suggests that since they are new to the university, they will listen more to peer advice.

The strong effect of hedonic motivation and performance expectancy on male students, and social influence on female students indicated that females are more susceptible to influence from peers and others to use the new technology or new method, which is consistent with the UTAUT model. Female students expect more support, and the existence of facility is important for them. The strong and significant effect of hedonic motivation among females is consistent with Chou, Wu, and Chen (2011), who indicated that male students had a more positive attitude towards the Internet-related enjoyment dimension compared to female students. Male students are more interested in increasing their performance and find new methods or way of study, which will encourage them to spend more time using e-learning via Facebook, culminating in a habitual practice. Previous research shows that males spend more time online than females (Hargittai and Shafer 2006).

Hedonic motivation, perceived playfulness, and effort expectancy were strong in older students, while performance expectancy was more important for younger students. It suggests that older students search for technologies that are user-friendly, enjoyable, and attractive, while younger students prioritise their performance, followed by easiness and pleasure of using e-learning via Facebook. Both groups have almost similar perceptions towards social influence or the existence of facilitating conditions. The results of the study supported previous research finding, such as that of Venkatesh and Zhang (2010), who found support on the moderating effect of gender and age, and argue that males are more interested in performance accomplishments compared to females. They argued that younger individuals have a stronger desire to be successful in their careers compared to older workers.

6.1. Theoretical implications

From a theoretical perspective, this study provides additional evidence on the appropriateness of using UTAUT2 (Venkatesh, Thong, and Xu 2012) to explain the usage of Facebook (social media/social network) as an educational tool. Investigating the effect of social network sites is impossible without considering the different values and dimensions that provide knowledge related to different aspects of using these technologies. Therefore, we added playfulness to measure the students' curiosity and pleasure of using a new technology, and examined UTAUT2 in the social media/social network context. The predictors of intention to use e-learning via Facebook is divided into three categories, namely, hedonic, utilitarian, and communication values, and were tested among undergraduates in Malaysia. The hedonic values in this research measured user self-fulfilment, while the utilitarian values measured instrumental values. Communication measured the effect of the social influence on the intention to use e-learning via Facebook. Furthermore, this study was conducted to provide rich knowledge related to the usage of social media/social network technologies, which may satisfy users' hedonic needs more than utilitarian needs. This study identified factors that affect students' use of e-learning via Facebook. The results of this study highlighted the fact that the use of social network sites has the ability to satisfy students' various requirements and needs, such as utilitarian and hedonic. We provide a clear picture of utilising social networks, especially Facebook, as a complementary tool for teaching and learning, and the findings of this study can be used to improve students' learning process and enhance the relationship between the teacher (instructor) and

students, which will simplify the process of teaching, rendering it more effective.

6.2. Managerial implications

Social networks, podcasts, videos, blogs, and wikis are valuable tools for teaching and learning, and many researchers suggest that social media sites can be valuable tools for collaborative learning. The findings of this study can have important implications for teachers (instructors), as well as academics who are interested in enhancing online learning or using social network/social media as educational tools. The findings helped us understand why students choose to engage in social media, specifically Facebook, which will be useful for educators and academic managers as well. A better understanding of the determinants of intention and the use of e-learning among students and useful technology will allow for more informed decisions in implementing the right educational technologies in higher educational institutions. Managing technology, making teaching and learning attractive and enjoyable, and encouraging students to participate and use e-learning are important managerial concerns in many academic institutions. The results of this study will help academic managers understand the advantages of using new technologies (e.g. social network/social media) in educational institutions and create an environment that is interesting to the students. Communicating with students will make us aware of their preferences and needs, which will help managers arrange courses and activities based on their desires and needs. Facebook is a social network site that was originally designed for entertainment and socialisation instead of education, but it has a great potential to be used as a teaching tool and enhance learning experience. Facebook (social network/social media) can be used as an educational tool to promote e-learning, connect students and instructors, and create a more comfortable classroom climate. Teachers could consider Facebook as a more informal tool that could create a more comfortable atmosphere for online interactions with social, emotional, intellectual, and academic dimensions. Academic managers and lecturers can use the results of this study for the utilisation of the social media/social network as a complementary tool for teaching and learning.

6.3. Limitations of the study and future research

Future research is essential to validate the findings of this study in different contexts and users, as suggested by previous researches. Applying the research model in different contexts, cultures, or other social network sites would result in new knowledge. This research does not consider the effects of other social networks, such as YouTube, Instagram, and Pinterest, on students' use of e-learning; therefore, future research can consider the effectiveness of these social networks on students' engagement with e-learning and its respective effect on their performance. The use of different technologies for teaching and learning will result in different outcomes, and it should be investigated in more depth. The sample of this research is small, since it monitors the entire process. Future research will need to examine the use of social network/social media among different groups and cultures. It could also consider the effects of e-learning via Facebook on students' academic motivation to study and academic performances.

7. Conclusion

This study examined the UTAUT2 model in the context of e-learning via Facebook, which resulted in useful data related to the capability of using social media/social network as a complementary tool for teaching and learning. We added playfulness to the UTAUT2 model and categorised the predictors of intention to use into three core determinants, namely, hedonic values, utilitarian values, and communication values, and the use of e-learning via Facebook into three determinants, namely, intention to use, facilitating conditions, and habit, along with three moderators, namely, gender, age, and experience. The results confirmed the important effects of hedonic, utilitarian, and communication values, and showed that users will be interested in technologies that are able to satisfy multiple needs. The probability of students using e-learning is much higher if they discover that the materials in that platform could allow them to have fun, experience pleasure, and communicate with others. This will happen because students will be exposed to course-related links and videos when they plan to spend time on Facebook to satisfy their communication and hedonic needs instead of utilitarian needs (study). Watching videos or checking uploaded documents will create extra time for learning, while they think they are using Facebook and spending time interacting and communicating on Facebook for purposes other than studying. The findings show that using social media, especially Facebook, for the purpose of teaching and learning, is interesting and beneficial for students. The students commented that they benefited from this method more than the traditional approach to teaching. Overall, the findings of this study enhanced our understanding on the effects of using social network sites for different purposes, specifically the use of Facebook for teaching and learning, and therefore present

considerations for educators to enhance and alter their respective practices.

Disclosure statement

No potential conflict of interest was reported by the authors.

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Appendix 1

	Factor loading	Cronbach alpha α
Performance expectancy		
I find e-learning through Facebook to be useful in my Study.	0.893	0.918
Using e-learning through Facebook enables me to accomplish tasks more quickly.	0.897	
Using e-learning through Facebook increases my productivity.	0.822	
Using e-learning through Facebook increases my chances of getting more positive learning benefit.	0.876	
Using e-learning through Facebook gives me power of competitiveness.	0.815	
Effort expectancy		
My interaction with e-learning through Facebook is easy to understand	0.718	
It is easy for me to become skilful at using e-learning through Facebook.	0.831	0.934
Learning to operate e-learning through Facebook is easy for me.	0.780	
I find e-learning through Facebook easy to use.	0.801	
Facilitating conditions		
There are special supports (i.e. workshop) for using e-learning through Facebook for students in the university.	0.721	
E-learning through Facebook is not compatible with other systems I use.	0.808	0.819
There is external/internal support group available for assistance with e-learning through Facebook should I have any difficulties.	0.803	
I have the knowledge necessary to use e-learning through Facebook.	0.822	
I have resources necessary to use e-learning through Facebook in my study.	0.822	
Hedonic motivation	0.727	
Using e-learning through Facebook is fun.		
I have personal satisfaction in using e-learning through Facebook.	0.800	
Using e-learning through Facebook is enjoyable.	0.825	
Using e-learning through Facebook in my study is an attractive idea.	0.767	0.809
I am very enthusiastic to use e-learning through Facebook in my study.	0.854	
Using e-learning through Facebook is very entertaining.	0.793	
Social influence	0.833	
In general, the whole university has supported the use of e-learning through Facebook.		
People who are important to me think that I should use e-learning through Facebook.	0.769	
People whose opinions that I value prefer that I use e-learning through Facebook	0.823	0.897
People who influence my behaviour think that I should use e-learning through Facebook.	0.817	
Intention to use	0.897	
I predict I will use e-learning through Facebook if it is available in the future.		
I will always try to use e-learning through Facebook in my study.	0.727	
I plan to continue to use e-learning through Facebook frequently.	0.808	
I plan to use e-learning through Facebook in my study in the next 3 weeks.	0.780	0.877
I intent to use similar e-learning through Facebook in the future.	0.876	
I will learn to operate e-learning through Facebook in my study.	0.833	
I will use e-learning through Facebook to achieve more opportunity in my life.	0.811	
I will use e-learning through Facebook because I cherish the feeling of a useful service.	0.741	
I will use e-learning through Facebook that enables me to finish my study successfully.	0.801	
I have very seriously thought of using e-learning through Facebook in my study if it is available, within next 2 months.	0.780	
Habit	0.785	
The use of e-learning through Facebook has become a habit to me.		
I am addicted to using e-learning through Facebook.	0.875	
I must use e-learning through Facebook all the time in my study.	0.844	
Using e-learning through Facebook has become natural to me.	0.744	0.811
Playfulness	0.677	
When using e-learning through Facebook, I will not realise the time elapsed.		
Using e-learning through Facebook leads to my exploration.	0.836	
Using e-learning through Facebook gives me enjoyment in learning.	0.820	
Using e-learning through Facebook stimulates my curiosity.	0.876	0.891
When using e-learning through Facebook, I will forget the work I must do.	0.905	
	0.882	

How many times per day do you post/update/share status on Facebook?	(1) Not at all (2) 1–5 times (3) 6–10 times (4) 11–15 times (5) More than 15 times
On average, how much time per day do you spend on Facebook for learning purpose?	(1) 1 hour or less (2) 1–2 hours (3) 2–3 hours (4) 3–4 hours (5) 4 hours and above
On average, ***how frequently*** do you normally use e-learning (any online material) through Facebook for the purpose of your study?	(1) Not at all (2) less than Once a week (3) about once a week (4) 2 or 3 times a week (5) 4 or 6 times a week (6) about once a day (7) more than once a day
On average, how much time do you spend to use e-learning material through Facebook in a day?	(1) Not at all (2) 30 minutes to 1 hour (3) 1–2 hours (4) 2–3 hours (5) 3–5 hours (6) more than 5 hours