

An Adoption Model of Mobile Knowledge Sharing Based on the Theory of Planned Behavior

Ahmad Mtair Hawamleh and Amir Ngah

*School of Informatics and Applied Mathematics, Universiti Malaysia Terengganu,
21030 Kuala Nerus, Terengganu, Malaysia.
Ahmad.hawamleh@yahoo.com*

Abstract—Resting on the use of mobile device which is increasingly popular worldwide, mobile learning and sharing knowledge between among students and academicians in fact extends the reach of education and sharing knowledge to all social-economic levels independent of location and time, indicating a new opportunity for education industry development and sharing knowledge. Nonetheless, there is still a lack of a comprehensive understanding regarding the factors affecting the adoption of mobile phone technology for learning and sharing knowledge. In this light, an adoption model of mobile phone technology knowledge sharing was built in this paper based on the Theory of Planned Behavior, in which perceived enjoyment, facilitating conditions, interpersonal influences, perceived usefulness, external influence, mobility, self- efficacy, and perceived ease of use of mobile sharing knowledge are integrated in order to increase the predictive capability of model. This model hopefully provides a framework for future research, and will serve as a basis for our future survey and analysis of data.

Index Terms—Adoption Model; Knowledge Sharing; Mobile Knowledge Sharing; Theory of Planned Behavior.

I. INTRODUCTION

Many establishments challenged with competition and increasingly changing environments are starting to realize the untapped resources diffused around in the organization, which is knowledge [1, 2]. Regarding the value of knowledge, it is undoubtedly the most important instrument in any organizations [3-10]. It is even more significant for the Institutions of Higher Learning (IHLs) [5, 9, 11-16]. According to [17] and [18], since most workers in knowledge-based establishments such as IHLs are knowledge based workers, knowledge sharing is essential. [17] also noted that “although the majority of the knowledge management literature discusses knowledge sharing activities within profit-oriented enterprises, it is becoming a trend that more universities and higher educational institutions have started to adopt knowledge management practices as well, thus knowledge sharing emerges as an important topic for discussion in academic institutions”.

Interestingly, most of the IHLs are not furnished with proper mechanism to pave ways for knowledge sharing like other business establishments due to lack of expertise, and the knowledge sharing culture especially in Institutions of Higher Learning is still very low [16].

On the other hand, the ever increasing use of mobile services and its potential has become an issue throughout the world [19]. According to [20] the global mobile phone subscriber market reached with 4.1 billion users in 2013 and will hit 5.7 billion in 2019. Mobile phone technology, which

provides mobile computing using portable devices through wireless connections [21], has scaled up as new found system in IT revolution. [22] mentioned that “a survey of experts’ shows they expect major technology advances as the phone becomes a primary device for online access, voice-recognition, and the structure of the Internet itself improves”. Moreover, this trend in technology is gaining more ground in organizations [23]. According to [24], mobile phone technology increases internal communication and knowledge sharing.

Furthermore, [25] stressed that mobile phone technology is very important for a number of reasons such as:

- i. It keeps us in contact with networks for browsing, internet search, and mail at any time in any place. Mobile phone technologies will become the most universal and compulsory Internet device in 2020.
- ii. The portability and elongation of battery charge is an attractive part of the system.
- iii. The increase in memory capacity enhances more programs to be run simultaneously without interference.
- iv. At the time of this writing, it is available everywhere in the public areas.
- v. The following characteristics favor mobile phone technologies (e.g. suitability flexibility, and cost reduction).

With the stated benefits of mobile phone technology, only a few IHLs integrate mobile phone technology into their systems, for example, University of New South Wales (Australia), Louisiana State University (USA), University of South Dakota (USA), and Kingston University (UK) [26-30]. Adequate technological means for the use of mobile devices are scarcely available in the academic Institutions of Higher Learning [31]. [32] conducted a survey of twenty-nine manufacturers of mobile technologies, businesses and education suppliers and affirmed that mobile phone technology is in use in some commercial establishments, but with very few in IHLs.

It can be summarized that the literature thus far give evidence that the resources of mobile phone technology are great and it has paved the way for opportunities and avenues for improving knowledge sharing activities among academicians in IHLs. However, it was found that there was, in general, lack of knowledge sharing in IHLs [33, 34] and particularly, lack of knowledge sharing activities among academicians in IHLs [35, 36]. Also, it was established that there was lack of academic research on the use of mobile phone technologies for knowledge sharing purposes in IHLs [37, 38]. Accordingly, there is a need for a research to analyses factors that determine the use of mobile phone to

promote knowledge sharing among academicians in IHLs.

II. THEORY OF PLANNED BEHAVIOR (TPB)

Promotion of knowledge sharing in the IHL, due to some factors, the past studies and main theories on technology acceptance have been utilized before the acceptance of mobile technology. Many theories have been postulated to enhance the understanding of adoption of technology [39] [40].

Using TRA, [42] formulated Theory of Planned Behavior (TPB). A model proposed by TPB affirmed that joining attitude toward factors such as behavior, perception of behavioral control and subjective norm guided human action. In TRA, two significant questions necessary to be asked in order to predict individual action to do something are; (1) Does that individual favor the behavior (attitude)? (2) Does that individual react to social pressure in executing such an action (subjective norm)? More so, TPB asks, “Does that individual feel he or she needs to perform such behavior?” [41].

Figure 1 depicts the blending of attitude in respect to the behavior, perception of behavioral control and subjective norm which formed behavioral intention. According to [42], immediate predecessor of behavior is the definition of intention. Therefore, the main control over behavior as a result of opportunity that comes is assisted by individual intentions. At times, there is limitation to the control that reluctantly delay the expected behavior to be performed, thus necessitating the consideration for perceived behavioral control in line with intention when explaining behavior. According to [42], the perceived behavioral control act as a precursor to actual control when it is appropriate and this will add to the forecasting of the behavior in question.

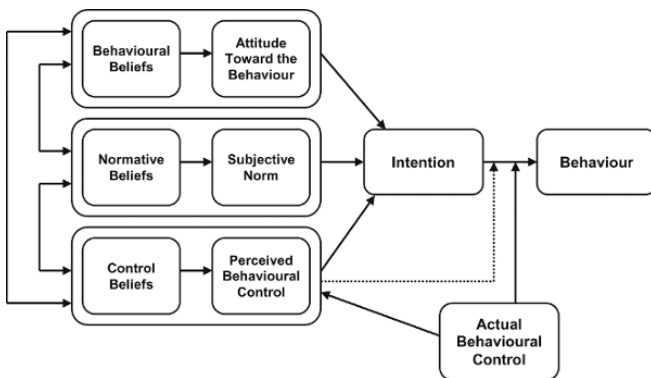


Figure 1: Theory of Planned Behavior (TPB)

A. Attitude towards behavior

The formulation of individual’s behavioral beliefs, positive or negative thinking about performing the behavior which is found by estimating a person’s beliefs about the resulting effects of the behavior as well as assessment of the values of these outcomes. The summing of the product of the strength of each person’s belief (B) that is weighted by evaluation (E) of the outcome gives the assessment [42].

B. Subjective norm

The social pressure that is thought in forming a behavior aroused from normative beliefs. Normative beliefs connote the perception of an individual revolving around the person or groups significant to the person feeling whether the

behavior should be done which include motivation to be in line with those expectations. Based on the work of [42], the assessment can be carried out when summing the product of the strength of each normative belief (N) that is measured by motivation to comply (M) with the referent in question.

C. Perceived behavioral control

The view of factors impacting the performance of behavior and the extent of those factors formed from the control beliefs of the person. Still on [42], assessment is carried out when summing the product of the strength of each control belief (c) that is measured by the perceived power (p) of the control factor.

“As a general rule, the more favorable the attitude and subjective norm, and the greater the perceived control, the stronger should be the person’s intention to perform the behavior in question” [42].

III. RESEARCH MODEL

This paper include factors to the model such as perceived enjoyment, facilitating determinants, interpersonal influences, perceived usefulness, external influence, mobility, self- efficacy, and perceived ease of use.

A. Attitude toward behavior dimensions

1) Perceived Enjoyment

Perceived enjoyment means the extent to which application of an innovation is perceived to be enjoyable in itself, which serve as source of intrinsic motivation [43], It was submitted that perceived enjoyment is seen to be the level of which the process of employing computers is perceived to be enjoyable in itself, aside from any performances that may be expected. Considering that both corporate users and consumers are functions of innovative market for mobile services, factors targeting perceived enjoyment consist of an essential consideration [44]. This means adopters apply an innovation for the pleasure in its acceptance might bring and, therefore, serve as an end unto itself. Still, intrinsic enjoyment such as engaging in mobile games satisfies hedonic needs and exists outside valued outcomes or present material needs (i.e. extrinsic motivations), improved job performance and give rise to pay for instance [45].

Also, current similar studies also prove that perceived enjoyment plays a vital role on the attitude toward usage [46] [47] [48]. The enjoyment that is caused by applying mobile services is estimated to affect the attitude and the minds of users to accept them. It was observed that people prefer to employ the mobile services that create enjoyment more widely compared to those that do not [49].

For this paper, the researchers described perceived enjoyment as “degree to which using mobile phone technology to promote knowledge sharing among academics is perceived to be enjoyable in its academic right and is considered to be an intrinsic source of motivation among them”. The mobile phone technology was characterized by entertainment, excitement, pleasantry for academics. Enough academic activities assisted by mobile phone technologies can be enjoyed in their daily schedule such as audio books, downloading video clips, interactive games, listening to Podcasts, streaming movies, MP3 player, personal organizer, searching information or services on web, making video calls. In class surveys/ questions etc. help in academics too.

The scholars suggested that perceived enjoyment positively impact the attitude towards applying mobile phone technology and behavioral intention employing mobile phone technology for encouraging knowledge sharing among academics in IHLs. Thus, addition of perceived enjoyment in to the model serves as the best solution so far.

2) *Mobility*

[50] pointed that mobility means the capacity of an individual to move around while remaining free to execute his/her task and interacting with other persons. In this new dispensation, professional and social life needs to be frequently in touch. As mobile phones permit users to embark on any task at a desired place within any convenient time, they may be seen positively by the users since today's business arena is a matter of mobility and speed which serve as norms. Based on this, more people tend to accept information and communication technologies which enhanced effective and efficient work while on the move. [51] support the statement instead of believing that mobile phones are accepted solely for the mobility they permit.

Moreover, in investigating the mobile phone technologies usage, [52] [53] showed that conventional acceptance models should be improved with mobility constructs. Also, the real time accessibility of information and communication in terms of work necessity, prompt need, contact and communication require mobility as a vital tool [54]. Mobile computing seems to be a charm to users who are frequently in motion which entails more freedom for information can be accessed anytime, anywhere.

As stated by [55], mobility is the main feature of mobile services and serve as the fundamental benefit of mobile learning as opposed to conventional education modules, like computing based learning [56].

For this paper, scholars defined mobility as "the ability of an academic to move on/off the campus while still being quite free to perform his/her job task and interact with other colleagues and faculty/university". By utilizing mobile phone technology, the academics possess additional freedom relating to time and place. Academics have opportunity to send and receive e-mail, instant messages, and short text messages anytime, anyplace. Furthermore, as earlier stated above, this includes sharing of administrative information with colleagues at any location at any time of the day.

The researchers opined that mobility is positively impacting attitude towards applying mobile phone technology for enhancing knowledge sharing among academics in IHLs. Therefore, mobility is necessary to be adopted in the model.

3) *Perceived Usefulness*

[57] described perceived usefulness as "the degree to which a person believes that using a particular system would enhance his or her job performance". Moreover, [58] explained perceived usefulness as "the degree to which an individual believes that using the services will contribute to reaching a particular objective". With reference to a study by [59] based on, information system acceptance, "a system that does not help people perform their jobs is not likely to be received favorably in spite of careful implementation efforts".

[60] affirmed that perceived usefulness positively impact the attitude toward application while [58] stressed that the influence of usefulness on attitude is on average balanced and

important. Furthermore, [61] pointed out that perceived usefulness is the most concrete explanatory variable in describing the variance in attitude.

A series of evidence confirming the vital effect of perceived usefulness on accepting mobile phone technologies [62-65] postulated that the perceived usefulness is a key factor in measuring adaptation of innovations.

In this paper, the researchers defined usefulness as "the degree to which an academic believes that using a mobile phone technology to promote knowledge sharing among academics would enhance academics' job performance". Many benefits of utilizing mobile phone technology include enhancement of academics efficiency in daily activity, preservation of a lot of academics' time, improvement in academics' effectiveness in performing daily activities, allows academics to perform their work comfortably, leads to increase their productivity and makes them social.

Additionally, scholars have suggested that perceived usefulness positively impacts the attitude towards employing mobile phone technology for improving knowledge sharing among academics in IHLs. Hence, it is necessary to incorporate usefulness into the model.

4) *Perceived Ease of Use*

There are various meanings of perceived ease of use. First, [57] explained perceived ease of use as the "degree to which a person believes that using a particular system would be free of effort". Second, [66] described it as "the degree to which the user expects the use of the system to be user friendly". Third, the ISO 9241 concluded it as "The extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use [67]. [68] said that utilization which is perceived easy to use is more tend to be adopted more by users. [69] pointed out that complexity and effort expectancy are referring to other constructs that constitute the notion of perceived ease of use. According to [70], the effect of perceived ease of use on a user's mind in accepting an innovation, be it directly or indirectly via perceived usefulness, has been well lettered in the literature.

The end user's opinion and attitude in line with technology is forecast by perceived ease of use that serve as antecedent of perceived usefulness, which in turn forecasts the acceptance [71]. [72] indicated that perceived ease of use impacts mind to use mobile services positively.

Generally, there is numerous evidence pointing to the importance of the effect of perceived ease of use on accepting mobile phone technologies [54, 72-75]. Still, [68] discussed that perceived usefulness is determined by perceived ease of use. Furthermore, [73] said that perceived ease of use influences the mind to apply technology.

For this paper, the researchers explained ease of use as "degree to which an academic believes that using mobile phone technology to promote knowledge sharing among academics in IHLs would be free of effort". When a system is confirmed to be easy to utilize, acceptance and use of such a system will rise. Moreover, it is parallel with the academics' requirements such as the to and from of short text messages (SMS) and (IMs) with each other, sharing administrative information with other colleagues, sharing and listening to Podcasts/audio books with other staff which might involve connection to social networking sites in mobile environment. Additionally, the application of these exemplary technologies is proven to be helpful for empowering the communication

between academics in university life at the usual time and in the intended environment in institutions of Higher Education. Briefly, perceived ease of use manifests a paramount role for acceptance of mobile phone technology in enhancing knowledge sharing among academics in IHLs.

The researchers opined that perceived ease of use positively impact perceived usefulness of employing mobile phone technology, attitude towards its uses, and mind of employing mobile phone technology for improving knowledge sharing among academics in IHLs. So, it is sufficient to incorporate ease of use into the model.

B. Subjective Norm Dimensions

[76] explained subjective norms as “the person’s perception that most people who are important to him think he should or should not perform the behavior in question” (p.302). [42] asserted that subjective norms are the type of norms molded through external and interpersonal influence. These norms are influential in describing the acceptance and use of new media [77].

1) Interpersonal Influence & External Influence

[78] suggested that, social influence means a perception in which individuals view an innovation as vital and should be utilized. For theory of reasoned action and planned behavior, social impact performs a critical role in examining the technology acceptance and usage. According to [79], people normally copy behaviors they observed in their social groupings. Therefore, behaviors seen in others effect the observer to imitate them [80]. Thus, social influence can be outstanding factors in influencing innovation acceptance decisions [70]. Base on work done by [81] contend that social effects tend to be more important in the previous instead of later phases of acceptance and its influence reduces with sustained usage. [78] added that social influence is effecting the innovation in voluntary settings.

[80] said that environmental effects which involve expert opinions, mass media reports, as well as personal impacts are considered by the adopters when making their adoption decisions. [80] stressed that interpersonal influence refers to word-of-mouth impact by particular groups like experts in technology, friends, superiors and peers. The suggestions of paramount referents truly matter; they are capable to form the basis for a user’s feelings pertaining to the utility of an innovation. For example, if one friend suggests that one certain innovation might be helpful, that might affect the user’s perception of the usefulness of the innovation [82]. Research indicated that pressure resulting from referent groups to accept an innovation is materialized because it contributes to lowering perceived risk aligned with adoption [48, 66, 82]

The researchers proposed that interpersonal influence and external influence will have a significant, positive impact on the subjective norm of mobile phone technology for enhancing knowledge sharing among academics in IHLs. Thus, it is sufficient to involve interpersonal influence into the model.

C. Control Behavior Dimensions

1) Self-Efficacy

[83] stated that self-efficacy is each person’s confidence that adoption of a service will result in the expected behavior. The evaluations of self- efficacy are mostly detected in

attributes of each individual adopter, like knowledge, experience, and abilities. For instance, [61] asserted that young people perceive mobile phones as more attractive than PC's. Based on this, there will be higher expectation of self-efficacy as regards young users compared to other users in general, and thus, of less significant as a factor of adoption. [61] discovered that person with low self-efficacy have less respect for the use of mobile phone services.

For this paper, the researchers described self-efficacy as “an academicians self confidence in his/her ability to perform a controlled behavior to use mobile phone technology to promote knowledge sharing among academics in IHLs”. For instance, academics can apply mobile phone technology without help from others.

The researcher suggested that self-efficacy positively impacts the control behavior in utilizing mobile phone technology for improving knowledge sharing among academics in IHLs. Hence, it is sufficient to incorporate self-efficacy into the model.

2) Facilitating Conditions

According to [84], facilitating conditions are the external controls and catalysts in the acceptance environment with the intention to enhance adoption and inflow of new technologies whereas [85] stated that facilitating conditions means the availability of resources necessary to engage in a behavior, such as time or money. [86] said that behavior cannot happen when objective conditions in the environment detract it. Further, facilitating conditions succeed in making adoption behavior less hard by blocking any obstacles to adoption and sustained usage [78]. These conditions can be presented by the government, mobile operators, mobile content providers, and the remaining stakeholders in the context of mobile adoption [48]. Thus, mobile operators can improve the extent of adoption by providing handset subsidies, mass advertising campaigns, free content, and effective promotion planned at improving awareness about mobile services [66]. Owing to this, promotional approaches positively influence the attitudes as well as users’ behavioral mind in adopting mobile services.

The researchers opined that facilitating conditions will have a positive impact on the control behavior to utilize mobile phone technology for improving knowledge sharing among academics in IHLs. Hence, it is adequate to incorporate facilitating conditions into the model.

IV. CREATION MODEL

The research model used to tailored the study is depicted in Figure 2, which proposes that external influence, facilitating conditions, interpersonal influences, perceived enjoyment, perceived usefulness, mobility, perceived ease of use, self-efficacy, behavioral intentions, attitude toward, behavioral control, and subjective norm are main potential factors of adoption to utilize mobile phone technology for improving knowledge sharing among academics in IHLs.

V. CONCLUSION

This study was conducted to explore the factors determining the adoption of mobile phone technology which can be employed in improving knowledge sharing among academics in IHLs. Thus, a mobile phone knowledge sharing model using Theory of Planned Behavior was developed.

This paper focuses on four variables which include the following: (perceived enjoyment, perceived mobility, perceived usefulness, perceived ease of use) concerned with academics' attitude toward applying mobile phone technology, two variables (interpersonal influence, external influence) pertain to academics subjective norm to apply mobile phone technology, two variables (self-efficacy, facilitating conditions) for academics' behavioral control to apply mobile phone technology, and five variables (attitude, subjective norm, behavioral control, perceived enjoyment, perceived ease of use) for academics' behavioral intention to apply mobile phone technology.

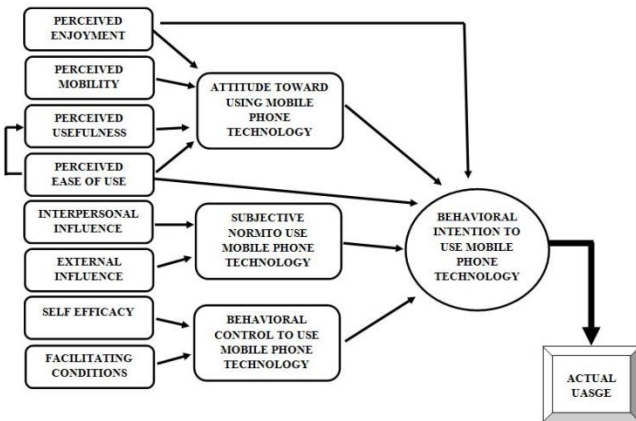


Figure 2: Research Model

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