ANALYZING THE INFLUENCE OF CULTURE ON TECHNOLOGY ACCEPTANCE MODEL

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ANALYZING THE INFLUENCE OF CULTURE ON TECHNOLOGY ACCEPTANCE MODEL

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STATEMENT OF NON-PLAGIARISM PAGE

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ABSTRACT

ANALYZING THE INFLUENCE OF CULTURE ON TECHNOLOGY ACCEPTANCE MODEL

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The thesis aims to analyze TAM studies in the literature for different countries and cultures. It is found that applying the basic TAM model without considering the cultural differences may give unrealistic results. For this reason, applying the basic TAM model in, especially, western and eastern societies may give incomparable results to each other. In the study, relations among perceived ease of use, perceived usefulness and behavioral intention are focused as potential predictors, mostly. The studies in the literature are found not universal as they hardly focus on specific fields and participants' cultural characteristics, to our knowledge.

The findings support that applying the basic model to determine the acceptance of new technologies by users who have low power distance and individualistic cultural background may give more reliable results when compared to people who has high power distance and collectivistic culture.

The study has restrictions as it relies on a literature survey although building a logistic regression model has been attempted.

Keywords: TAM, power distance, individualism, collectivism, perceived ease of use, perceived usefulness, behavioral intention.

ÖZ

KÜLTÜRÜN TEKNOLOJİ KABUL MODELİ'NE ETKİLERİNİN İNCELENMESİ

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Bu tezin amacı, farklı ülkeler ve kültürler üzerine yapılmış Teknoloji Kabul Modeli (TAM) çalışmalarını incelemektir. Temel TAM modelini, kültürel farklılıkları düşünmeden uygulamak gerçek dışı sonuçlar verebileceği bulunmuştur. Bu nedenle, özellikle, batı ve doğu toplumlarında uygulanacak temel TAM modeli, birbirleriyle kıyaslanamaz sonuçlar verebilir. Çalışmada, belirleyici olarak daha çok, algılanan kullanım kolaylığı, algılanan fayda ve davranışsal eğilim arasındaki ilişkilere odaklanılmıştır. Araştırdığımız kadarıyla, literatürdeki çalışmalarda, araştırmacıların, belirli alanlara odaklanarak kullancıların kültürel farklılıklarını göz önünde bulundurduklarını söylemek zor.

Yapılan bu çalışmanın sonucunda, temel modelinin farklı kültürel yapıya sahip kullanıcılara uygulandıgında, düşük güç mesafesi ve bireysel düşünce yapısına sahip toplumların kullanıcılardan alınan sonuçların, yüksek güç mesafesi ve toplumsal düşünce yapısına sahip kullanıcılardan alınan sonuçlara oranla daha güvenilir olabileceği ortaya konulmuştur.

Araştırmada taranan verilerle lojistic regresyon modeli oluşturmaya çalışılmış olsa da literatür araştırmasına ağırlık verildiğinden kısıtlamalar ortaya çıkmıştır.

Anahtar Kelimeler: Teknoloji Kabul Modeli, Güç mesafesi, Bireysel Düşünce Yapısı, Toplumsal Düşünce Yapısı, Algılanan kullanım kolaylığı, Algılanan fayda, Davranışsal Eğilim.

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LIST OF ABBREVIATIONS

ATT	Attitude Toward Using
AU	Actual System Use
BI	Behavioural Intention
I/C	Individualism/ Collectivism
IT	Information Technologies
ICT	Information and Communications Technology
LMS	Lecture Management System
M/F	Masculinity/ Femininity
PD	Power Distance
PEOU	Perceived Ease of Use
PU	Perceived Usefulness
TAM	Technology Acceptance Model
TRA	Theory of Reasoned Action
UA	User Acceptance

CHAPTER 1

INTRODUCTION

Information Technology has been playing a significant role in every individual's life to the extent that it impacted the definition of education. Nowadays people of different ages would like to access quality and efficient education/knowledge at any time and from anywhere. After distance education or, the so-called, e-learning based systems came to our lives, having an education on another level that is beyond the classroom walls, simply meant fewer obstacles for people who want to access education.

E-learning has gained considerable popularity as an educational system for people who face difficulties to have a formal and physical education. Many e-learning applications that exist for people who are ready to start a virtual learning process. Some of them are Schoology, Coursera, Moodle, Symbiosis and several other options. As Urdan and Weggen put it, E-learning is one of the distance learning models. Besides, it simply describes the learning process through Network Technologies, which can be defined as the internet, intranet, and extranet (Urdan & Weggen, 2000). Means, Toyama, Murphy, Bakia, and Jones (2009) define online learning/ E-learning "as learning that takes place partially or entirely over the Internet" (2009, p. 9). They also clarify that online learning "excludes purely print-based correspondence education, broadcast television or radio, video-conferencing, videocassettes, and stand-alone educational software programs that do not have a significant Internet-based instructional component" (Means et al., 2009, p. 9). Despite the benefit of using these online learning applications and portals, for some reason or another, it does not go without challenges. Here, comes the importance of applying the Technology Acceptance Model (TAM) with the aim of understanding the acceptance level of these applications from the user's perspective and among them.

Initially, the TAM model was formulated by Davis in 1989 in order to determine the usage of technology based on user perception. This model has five main predictors to analyze as well as understand the user's acceptance level of the new technology. These predictors are as follows: Perceived Usefulness, Perceived Ease of use, Attitude Toward, Behavioral Intention and Actual Usage. In a valuable amount of research, the TAM model is applied to understand the satisfaction level. Moreover, it can be applied to investigate user acceptance in education, using various web-based e-learning systems (Mun & Hwang, 2003; Ngai et al, 2007; S. Y. Park, 2009; Roca et al. 2006; Wu et al. 2010). Legris, Ingham, and Collerette (2003) show the variety of technologies where different researchers have used TAM, such as voice mail, email, and programming tools.

The basic TAM questions:

Perceived Usefulness Question (PU)

This technology:

- Increases work/job/study performance
- Enhances productivity during work/job/study
- Improves effectiveness of work/job/study
- Benefits work/job/study

Perceived Ease of Use Questions (PEOU)

This technology is:

- Easy to be acquired
- Easy to work with to achieve the sought-after benefits
- Easy to be mastered
- Easy to be operated

Behavioral Intention to Use (BI)

- Current desire leans towards using this technology for work/job/study purposes on regularly

As we can see the basic TAM questions are not considering the cultural aspects of the users. These questions are asked to gather a basic answer from users about the system satisfaction without focusing on the user's cultural backgrounds and so on. So, when these questions are applied to understand the acceptance level of users, the results that are gathered from the research are not fully fitting the actual results.

TAM model can be useful to determine user acceptance and satisfaction level and can help developers take corrective measures in order to improve the system for the users, but if this latter, who will use the new system, come from different cultural environment and have different backgrounds, the results that we have driven from the TAM model can be ineffective and may lead us to the wrong direction. Most studies in which the TAM Model have been applied do not focus on the users' cultural characteristics. As we all know, we live in a society with a variety of cultures, and human background, ideas, thoughts and behaviour that are shaped by geography and in turn, society, which surely is different than other in other parts of the country as well as between distinct societies. Assuming that these differences are the core factors that determine the consumer preferences, the question here is: is it prudent to utilize the TAM model without taking into consideration the different cultural and behavioural characteristics?

1.1. Purpose and Scope of the Study

The study aims of the study is to understand that TAM and its predictors are effective /reliable to predict or not user satisfaction level who has different backgrounds and cultural differences for to use E-learning applications. For this purpose, we have covered research reports from the literature on the subject.
RQ: Can TAM be employed in all cultures to understand BI?

1.2 Thesis Organization

This research papers is structured as follows: Section 2 about literature research. Section 3, describes the effects of cultural differences on TAM model. At the end, Section 4, presents the concluding remarks.

CHAPTER 2

THE LITERATURE REVIEW

E-learning

It is a well fact known that the terms distance learning, e-learning, and online learning are evolving everyday with the continuous development of technology. Conceptually, researchers have agreed on the terms, but not on the details. In other words, as technology advances, some researchers have broadened the definition to include and contain additional technologies (Means, Toyama, Murphy, Bakia, & Jones, 2009), while others narrowed the terms down to the minimum definitions (Friesen, 2009). For example, Urdan and Weggen (2000) created a framework for distance education to categorize subsets of distance learning. The four layers that clarify the specificity of distance education, from general to specific, are distance learning, e-learning, online learning, and computer-based learning (Urdan & Weggen, 2000). Distance education is an educational setting or envirenment where there is a distance that separates the instructors and students (Urdan & Weggen, 2000). Urdan and Weggen (2000) defined distance learning as the delivery of education or training courses "to remote locations via synchronous or asynchronous means of instruction, including written correspondence, text, graphics, audio and videotape, CD-ROM, online learning, audio and video-conferencing, interactive TV, and facsimile" (2000, p. 88). In this context, E-learning is a subset of distance learning that is a "confluence of educational psychology and instructional design, of educational technology and distance education, and recent technological developments related to the Internet and the Web" (Friesen, 2009, p. 6). An important aspect of Friesen's (2009) definition is the inclusion of educational methodologies, such as instructional design methods. With a focus on learning approaches, e-learning shows intentionality instead of the dissemination of information. Garrison and Kanuka (2004) include the term "thoughtful integration" (2004, p. 96) to

describe the incorporation of online learning experiences in blended learning. Online learning is the next layer of the distance learning model (Urdan & Weggen, 2000). It describes learning that uses the specific mediums of network technologies, which are the internet, intranet, and extranet (Urdan & Weggen, 2000). Means, Toyama, Murphy, Bakia, and Jones (2009) define online learning as an educational process that occurs in part or as a whole through the online virtual space; "as learning that takes place partially or entirely over the Internet" (2009, p. 9). On the one hand, they clarify that online learning "excludes purely print-based correspondence education, broadcast television or radio, videoconferencing, videocassettes, and stand-alone educational software programs that do not have a significant Internet-based instructional component" (Means et al. 2009, p. 9). On the other hand, Downes (2005) argues that e-learning is on a constant gradual development with technology, which explains the variations of its details in the two layers. Furthermore, literature indicates that many researchers and practitioners use online learning and e-learning synonymously (Ahmad Al-Adwan & Smedley, 2012; Liaw et al., 2007; Parkes, Stein, & Reading, 2015; Sife & Lwoga, 2007).

This research project only refers to the top two tiers of Urdan and Weggen's (2000) distance learning model with a focus on e-learning, which are distance learning and e-learning. This project uses Friesen's (2009) definition of e-learning but excludes the limitation of using the web since communication technologies, such as WhatsApp, use the internet and not the web. Therefore, e-learning is the "confluence of educational psychology and instructional design, of educational technology and distance education, and of recent technological developments related to the Internet" (Friesen, 2009, p. 6). E-learning Readiness Successfully implementing e-learning methodologies is contingent on many factors that educators should evaluate before using e-learning. These aspects include assessing the organization's readiness to adopt the principles and examining criteria to sustain the initiatives. Hence, E-learning Readiness is defined to be "the mental or physical preparedness of an organization for some e-Learning experience or action" (Borotis & Poulymenakou, 2004, p. 1622). Moreover, it is not a limites or strict binary value, but rather a measurement on a scale (Bessadok & Abdulsalam, 2016; Borotis & Poulymenakou, 2004). For example, Bessadok and Abdulsalam's (2016) readiness study in Saudi Arabia revealed a different scale of readiness for students who struggled with e-

learning. This progression of students contains those who have no intention of using e-learning without explicit requirements, those who need convincing that e-learning is beneficial, those who are convinced of e-learning but have computer anxiety, and those who faced substantial obstacles and need help overcoming them. In addition to being prepared both mentally and physically, students must possess study skills such as time management, critical thinking skills, technical competencies, and collaborative learning skills. Parkes et al. (2015) evaluated student preparedness on a generation of students in Australia who are considered technically competent. The research team argues that being technology-savvy does not mean that students are suited for studying in online learning environments (Parkes et al. 2015). Their study revealed four significant findings about the preparedness of these students. Firstly, students were poorly prepared in balancing their academic responsibilities, work, and personal lives in an e-learning environment (Parkes et al. 2015). Secondly, the students had low levels of preparedness related to critical thinking skills and general academic skills (Parkes et al. 2015). Thirdly, Parkes et al.'s (2015) study showed that students were adequately prepared in technical competencies relating to the internet. The study results indicate that typical web-browsing behavior is enough for students to transfer the skill to navigating course content. Furthermore, Parkes et al. (2015) suggest that students who lack experience using computer technology might struggle to use a Lecture Management System (LMS). Finally, the conclusion was that students were moderately prepared for engaging in collaborative learning (Parkes et al, 2015).

Researchers have developed a variety of e-learning readiness models for organizations to gauge the readiness level of various stakeholders or components (Aydin & Tasci, 2005; Borotis & Poulymenakou, 2004; Chapnick, 2000; Lopes, 2007; Psycharis, 2005). For instance, Chapnick's (2000) readiness model looks at eight different stakeholders at a horizontal level within an organization to simplify the process. Aydin and Tasci (2005) developed a table-based model to evaluate an organization's ability and willingness to adopt e-learning (Mosa, Naz'ri bin Mahrin, & Ibrrahim, 2016). The table has four rows of elements that are technology, innovation, people, and self-development to evaluate against three criteria-based columns of resources, skills, and attitudes (Aydin & Tasci, 2005). Lopes (2007) modified Borotis and Poulymenakou's (2004) generic model to focus on higher

educational institutes. The factors of Lopes' (2007) model are business, technology, content, culture, human resources, and finances. According to Lopes' (2007) model, the institute can only accept e-learning "if it is aligned with business aims and objectives and leads to the effective accomplishment of the business aims" (Mosa et al. 2016, p. 119). Psycharis (2005) uses a tree-like structure to narrow the focus and systematize all the components in resources, education, and environment. These factors also have independencies, such as the environment influencing resources and specifying education (Psycharis, 2005).

A comparison of these models shows their differentiating approaches and weaknesses. For example, Hashim and Tasir's (2014) analysis of twelve e-learning readiness assessment studies and instruments showed gaps in assessing readiness. They argue that most of the e-learning readiness instruments that they analyzed lack the criteria for a useful evaluation in emerging countries (Hashim & Tasir, 2014). Mosa et al.'s (2016) evaluation of ten different e-learning readiness models showed that technology was the common factor in all of them, with eight models listing learners as a factor. Content and resources were the next most frequent factors, showing up in six studies. Acceptance of e-learning was part of only two models, which indicates that the researchers did not deem it as an essential criterion in determining readiness.

The comparison of the factors of the technology aspect of e-learning readiness showed that internet access, hard-ware, and availability of computers were the top items (Mosa et al, 2016).

The readiness model (Chapnick, 2000) lists eight factors used to measure an organization's e-learning readiness, which are psychological, sociological, environmental, human resource, financial, technological skill, equipment, and content readiness. These criteria intend to answer the questions of (a) can we do this, (b) if we do this, how are we going to do it, and (c) what are the outcomes and how do we measure them? (Chapnick, 2000). Furthermore, Chapnick (2000) defines the top three common factors among the models analyzed by Mosa et al. (2016). Psychological readiness considers "the individual's state of mind as it impacts the outcome of the e-learning initiative," technological skill readiness gauges "observable and measurable technical competencies," and content readiness deals with "the subject matter and goals of the instruction" (Chapnick, 2000, p. 2). E-

learning Success Criteria Research shows that the critical success factors of developing and sustaining e-learning initiatives include a well-designed and functioning e-learning system (Holsapple & Lee-Post, 2006), social presence in the e-learning system (Johnson, Hornik, & Salas, 2008), institutional and financial support (McGill, Klobas, & Renzi, 2014), instructors having a positive attitude (Selim, 2007), and development of the faculty and staff (Sife & Lwoga, 2007).The general problems in developing nations add complexities to e-learning not seen in the developed countries, which can inhibit best practices in e-learning (Bhuasiri et al, 2012). Sife and Lwoga (2007) describe the difficulties of integrating technologies used for e-learning in Tanzania and state that Information and Communication Technologies (ICTs) "have not permeated to a great extent in many higher learning institutions in most developing countries due to many socio-economic and technological circumstances" (2007, p. 1). Based on Friesen's (2009) definition of e-learning, the role of ICTs is crucial to e-learning.

2.1 Technology Acceptance Model

This section describes features of Technology Acceptance Model (TAM) and the model's purpose to determine the usage of technology based on user perception. This project uses TAM to determine student perceptions of e-learning. +Figure 1 shows a systematic approach to testing and explaining the user acceptance of a broad range of new-user information systems (IS) or personal technologies across user populations (Davis, 1989; Davis et al. 1989). Mathieson's (1991) research verifies that TAM is also useful for predicting user intentions to use these technologies. The primary purpose of TAM is "to provide a basis for tracing the impact of external factors on internal beliefs, attitudes, and intention" (Davis et al. 1989, p. 985). Davis et al. argue that researchers can use TAM to determine the aspects of a system that the users find unacceptable and then take corrective action to correct the identified issues. Legris, Ingham, and Collerette (2003) show the variety of technologies where researchers have used TAM, such as voice mail, email, and programming tools.

Researchers have also used TAM to investigate user acceptance in education using various web-based e-learning systems (Mun & Hwang, 2003; Ngai et al. 2007; S. Y. Park, 2009; Roca et al. 2006; Wu et al. 2010). As a matter of fact, TAM does not go

without its criticisms or limitations (Christensen, 2013; Chuttur, 2009), but it is a highly appreciated and used model by researchers to determine user acceptance of various technologies (Chuttur, 2009). Chuttur's evaluation of prior research shows that most studies "found significant statistical results for the high influence of perceived usefulness on behavioral intention to use a specific system," and the research "also found mixed results for the direct relationship between perceived ease of use and usage behavior" (2009, p. 13). Studies using the TAM developed by Davis et al. (1989) had some limitations and lacked explanations of the reasons why a user perceived the system useful or not, which led Venkatesh and Davis (2000) to extend the model.

TAM is an extensible model that can include external features (Mathieson, Peacock, & Chin, 2001; Roca et al., 2006). Turner, Kitchenham, Brereton, Charters, and Budgen's (2010) survey of empirical related studies confirmed "many of the studies used modified versions of the TAM rather than the original model" (2010, p. 468). On the one hand, Venkatesh and Davis (2000) created TAM2 by extending the perceived usefulness determinant of TAM to include additional factors that provide granularity to explaining user intention. Venkatesh and Bala (2008) proposed TAM3 to include adding factors to perceived ease of use and incorporate relationships between other determinants. On the other hand, other researchers have extended TAM with the task-technology fit model (Dishaw & Strong, 1999; Klopping & McKinney, 2004).

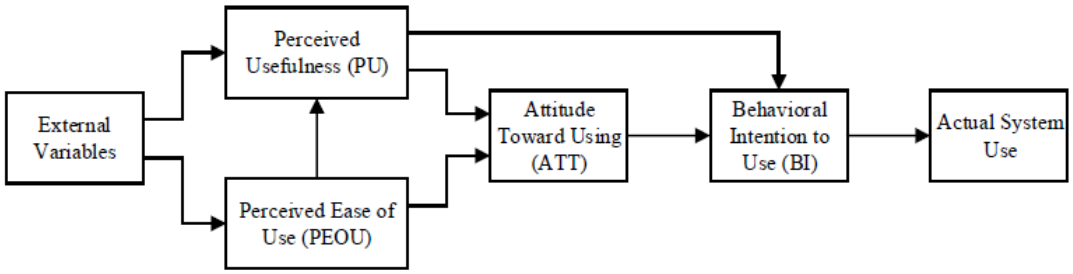

Figure 1: Technology Acceptance Model (TAM) (Davis et al., 1989)

2.1.1 Theoretical Framework

Foundational elements of TAM that determine actual system use are behavioural intentions (Davis et al., 1989) and attitudes (Davis, 1993). Ajzen and Fishbein (2005) argue that "people's behaviour follows reasonably from their beliefs, attitudes, and

intentions" (2005, p. 174). A driving factor of behavioural intentions is one's attitude (Montano & Kasprzyk, 2008). Davis (1993) explains that Ajzen and Fishbein's (1975) theory of attitudes is an underlying foundation of TAM, which (a) "specifies how to measure the behaviour-relevant component of attitudes," (b) "distinguishes between beliefs and attitudes," and (c) "specifies how external stimuli, such as the objective features of an attitude object, are causally linked to beliefs, attitudes, and behaviour" (1993, p. 476) Davis (1986) derived TAM from the Theory of Reasoned Action (TRA) to evaluate information systems. TRA is a theory of human behaviour that focuses "on theoretical constructs concerned with individual motivational factors as determinants of the likelihood of performing a specific behaviour" (Montano & Kasprzyk, 2008, p. 68). They explain that TRA supposes that behavioural intention is the best predictor of behaviour, "which in turn is determined by attitude toward the behaviour and social normative perceptions regarding it" (2008, p. 68). Davis et al. (1989) revised the proposed version of TAM (Davis Jr, 1986) to incorporate a feature "capable of explaining user behaviour" (1989, p. 985). This study refers to Davis' et al. (1989) version as the original TAM, as do other studies (Turner et al., 2010). While both TRA and TAM integrate behavioural attitudes, TAM uses the influences from perceived usefulness and attitude constructs to determine one's behavioural intentions to use the technology. TAM omits subjective norm from the TRA model.

2.2 TAM Limitations

TAM includes the determinants of perceived usefulness (PU), perceived ease of use (PEOU), attitude toward using (ATT), and behavioural intention to use (BI). External factors, such as system design, influence the determinants of PU, PEOU, and BI. Davis (1993) classifies external factors as "external stimulus," PU and PEOU as the "cognitive response," ATT as the "affective response," and actual system use as the "behavioural response" (1993, p. 476). TAM argues "that individuals' behavioural intention to use an IT is determined by two beliefs," which are PU and PEOU (Venkatesh & Bala, 2008, p. 275). Davis (1989) defines PU as "the degree to which a person believes that using a particular system would enhance his or her job performance" (1989, p. 320). He defines PEOU as "the degree to which a person believes that using a particular system would be free of effort" (1989, p. 320). Even

though researchers frequently cite (Christensen, 2013; Chuttur, 2009) and broadly use TAM in a variety of technology-related fields (Legris et al., 2003), research reveals the limitations of TAM. Known limitations are weak predicting factors, lacking verification of TAM predictions with objective data, using it in obligatory contexts, and applying it in different cultures. These limitations are directly connected to the context of the study in hand.

2.2.1 Examining TAM's Weak Prediction Factors

Studies show that certain TAM factors are not reliable predictors, notably that PEOU could be a weak predictor (King & He, 2006; Lee et al., 2005; Turner et al., 2010).Turner et al. (2010) performed a systematic literature review of empirical TAM studies and sought "to determine to what extent the TAM and its revisions have been validated for prediction of actual usage" (2010, p. 465). Out of the 79 empirical TAM studies that met their criteria, their results show "that BI is a better predictor of actual usage than either PU or PEOU" (2010, p. 470), with PEOU being the worse predictor of actual usage. Turner et al. also note that "All TAM variables are worse predictors of objective usage than subjective usage" (2010, p. 470). Furthermore, their findings indicate that most studies only examined subjective measurements but lacked the objective measurements of actual system usage. They conclude "that it is important to measure actual use objectively as there is a difference in the relationship between the TAM variables and subjective and objective measures of actual technology use" (Turner et al., 2010, p. 471). King and He (2006) performed a statistical meta-analysis of 88 published TAM based studies, and their overall conclusion is "that TAM is a powerful and robust predictive model" (2006, p. 751). They note: (a) PU and BI are highly reliable and can be used in a variety of contexts; (b) TAM correlations have considerable variability, but moderator variables can help to explain the effects; and (c) PU profoundly influences BI, which captures much of the effect of PEOU, however, PEOU directly impacts BI on the internet. Another limitation described by Turner et al. (2010) is that predicted usage by TAM does not automatically transfer to actual usage. Keung, Jeffery, and Kitchenham (2004) perform a follow-up study of the acceptance of new software cost estimation

technology in small software organizations. Keung et al. explain the initial TAM results indicated that users held positive indications about adopting the software. The actual usage results one year after implementing the new software showed almost zero usage. Problems with the software adoption included difficult-to-use software, lack of technical support, software that fails to meet the required needs, and the mismatch between the training and company needs (Keung et al., 2004). They argue that "there is a need for more work in the area of early prediction of future usage of a technology" and that TAM might not be "a valid measure for predicting future usage of technology unless people have experience of using the technology" (2004, p. 58). They recommend assessing the impact of introducing new technology and the plan for implementation (Keung et al., 2004).

2.2.2 Using TAM in Obligatory Contexts

Researchers note that TAM studies primarily focus on the voluntary usage of IS but give little attention to technology acceptance in mandatory environments (S. A. Brown, Massey, Montoya-Weiss, & Burkman, 2002; Chuttur, 2009). Studies that evaluate using the original TAM in mandatory settings show differences of the user behavioral intention between those in voluntary settings and those in mandatory settings (S. A. Brown et al., 2002; Hartwick & Barki, 1994). For example, Hartwick and Barki (1994) note a difference between user participation and involvement depending on whether the usage is mandated or voluntary, with the relationship being important only for optional use. In obligatory usage situations, Hartwick and Barki argue that researchers need to locate other success criteria since "the mandatory nature of usage makes it meaningless as an indicant of system success" (1994, p. 454). S. A. Brown et al.'s (2002) study demonstrated that the relationship between attitude and behavioural intention was not statistically significant. S. A. Brown et al. theorize that in cases of employment, the employees will use the system as long as they remain employed regardless of perceptions. Furthermore, their data showed non-significant relationships between the paths of perceived usefulness to behavioural intention and attitude to behavioural intention. To this point, they state that the "Users intend to use the system because they are mandated to do so—

perceived behavioural control and subjective norm serve to reinforce this intention" (S. A. Brown et al., 2002, p.290).

Studies on voluntariness in TAM2 and TAM3 show that the subjective norm determinant has a different effect on behavioural intention based on whether the system use is voluntary or mandated (Venkatesh & Bala, 2008; Venkatesh & Davis, 2000). Subjective norm is "the degree to which an individual perceives that most people who are important to him think he should or should not use the system" (Venkatesh & Bala, 2008, p. 277). In TAM2, Venkatesh and Davis (2000) proposed adding the voluntariness construct to address findings from research such as S. A. Brown et al.'s (2002) and Hartwick and Barki's (1994). Venkatesh and Davis's (2000) study included testing four different environments; two included mandatory usage, and two included voluntary usage. Their research revealed that "subjective norm had a direct effect on intentions for mandatory, but not voluntary, usage contexts" (Venkatesh & Davis, 2000, p. 198), indicating that these two groups exhibit different motivations for their behavioural intentions. Venkatesh and Bala (2008) further tested the voluntariness determinant during the development of TAM3. Their research showed "that the effect of subjective norm on behavioural intention was stronger in a mandatory context" (Venkatesh & Bala, 2008, p. 290). Rawstorne, Jayasuriya, and Caputi (2000) describe contexts, such as banking or health care, where using a particular information system is mandatory, and they attempted to predict system usage. In a hospital environment, Rawstorne et al. studied three different behavioural intentions on the compulsory use of a patient care information system. These three distinct usages were (a) updating the care plans as changes occurred, (b) using the care plans for planning care delivery, and (c) using the care plans as an educational tool for students and new graduates (Rawstorne et al., 2000, p. 39). Their results showed that TAM failed to predict the behaviour of the first usage case, but successfully predicted the usage of the second and third cases.

2.2.3 TAM in E-learning Contexts

Regardless of the TAM's limitations, educational researchers have used it to evaluate the acceptance, satisfaction, or intention to use E-learning (Al-Gahtani, 2016; S. Y. Park, 2009; Roca et al., 2006), blended learning (Padilla-MeléNdez et al.,

2013; Tselios et al., 2011), e-portfolio systems (Shroff et al., 2011), a digital library system (N.Park et al., 2009), web-based systems (Lee et al., 2005; Mun & Hwang, 2003), LMSs (Alharbi & Drew, 2014; Ngai et al., 2007), open education resources (Kelly, 2014), and technology in education (T. Teo, 2011). In the context of e-learning, S. Y. Park (2009) defines PEOU as "the extent to which one believes using e-learning will be free of cognitive effort" (2009, p. 152).

External variables such as navigation issues, lack of intuitive design, or unclear instructional materials affect learner's perceived ease of use. S. Y. Park (2009) defines PU as "the extent to which a university student believes using e-learning will boost his or her learning" (2009, p. 152). S. Y. Park (2009) used TAM to analyse student perception of e-learning in fully online courses in a higher education context. He noted issues that inhibit implementing e-learning at universities and argues that a significant point is "identifying the critical factors related to user acceptance of technology" (2009, p. 150). He reasoned that researchers should base one area of inquiry on understanding "how students perceive and react to elements of e-learning" (2009, p. 150). His study confirmed that using TAM is "a useful theoretical model in helping to understand and explain behavioural intention to use e-learning" (2009, p. 158). The results showed that the most important TAM construct that affects the students' behavioural intention to use e-learning was self-efficacy. The next most important construct was a subjective norm, which affects behavioural intention and attitudes. The study notes that PU and PEOU had no direct effect on the students' intention to use e-learning, but the determinants influenced their attitudes toward e-learning (S.Y. Park, 2009).

Lee et al. (2005) used a modified version of TAM to examine the role of extrinsic and intrinsic motivating factors to determine the student acceptance of an internet-based learning medium (ILM). The extrinsic motivation factors use the PEOU and PU constructs, and the intrinsic motivators used the perceived enjoyment construct. They explain that supporting and improving student learning is a primary goal of using an ILM since "user acceptance and usage are important primary measures of system success" (Lee et al., 2005, p. 1096). Their results showed that perceived usefulness and perceived enjoyment were important factors in affecting student attitude and intention to use ILM. Lee et al. (2005) noted that PEOU was not a significant contributor to student attitude, but PEOU indirectly influenced

behavioural intention through perceived usefulness and perceived enjoyment. Mun and Hwang (2003) evaluated student acceptance of Blackboard using TAM. Like Lee et al. (2005), Mun and Hwang noted that actual system use is a success factor of IS, but explain that student use of Blackboard was voluntary. This project used an extended version of TAM to include the determinants of enjoyment, learning goal orientation, and self-efficacy (Mun & Hwang, 2003). Their study showed that enjoyment, learning goal orientation, and self-efficacy were relevant factors of user acceptance. Mun& Hwang (2003) note that ease of use was not a significant determinant. Ngai et al. (2007) extended TAM to examine student acceptance of WebCT in a higher education context where using the system is mandated. They added a technical support determinant as an external influencer to both PEOU and PU. In evaluating WebCT for both teaching and learning, the goals of their research were threefold: (a) "to determine the current usage of WebCT;" (b) "identify the factors affecting the acceptance of WebCT;" and (c) "develop a model for the acceptance of WebCT in Hong Kong for higher education based on the TAM" (Ngai et al., 2007, p. 251). Their results show that technical support played a significant role in affecting both PEOU and PU. Additionally, their analysis shows a weak direct effect on actual system usage and that "a positive attitude among students towards WebCT may not generate an increase in the actual use of the system if lecturers do not require them to use the system" (Ngai et al., 2007, p. 263).

They theorize that this weak connection could be from a compulsory use of WebCT since the students did not have a choice. They confirm the use of TAM in an educational context to evaluate LMS usage as they state that their investigation "provides further evidence of the appropriateness of applying TAM to measure the acceptance of WebCT in higher education" (Ngai et al., 2007, p. 263).

2.2.4 TAM Dimension Descriptions

Educational researchers frame the TAM factors in an LMS context to show relevance to the education environment. Dimensions of PEOU relate to how well the user can navigate the LMS and accomplish his or her intended goal (S. Y. Park, 2009), which includes navigating to the desired module and performing the particular action, such as playing the video or locating the sought after learning materials.

Dimensions of PU relate to items that affect the learner's ability to learn from the LMS (S. Y. Park, 2009). Additional factors such as the quality of content, meaningfulness of interaction with the system, or factors such as the quality of the video and sound influence perceived usefulness. For the learner to find the LMS useful, he or she will need to find equal or more value in using the LMS (S. Y. Park, 2009) as compared to the student's usual way of acquiring knowledge in a traditional learning environment. In other words, the LMS provides the student with more significant learning opportunities than the learner would otherwise have. Dimensions of ATT relate to the user's positive or negative feeling concerning theuse of the LMS, intending to act in a certain way (Han & Shin, 2016; McGill & Klobas, 2009). Examples of emotions relating to the LMS used in prior research are levels of confidence (Liaw et al., 2008) and enjoyment (Ngai et al., 2007; Padilla-MeléNdez et al., 2013), the sense of it being a good or bad idea. (Alharbi & Drew, 2014; Ngai et al., 2007).

2.3 Conclusion

In this research, we have made literature review and search what follows;

- Definition of E-learning and distance education
- Success Criteria of E-learning
- Definition of TAM model
- TAM model Limitations (PU, PEOU, ATT, BI)
- TAM weak prediction factors
- TAM obligatory contexts
- How to apply TAM in E-learning?
- Factors which affect the TAM model

Distance learning is considered one of the ways of education where distance separates the lecturer/instructor and students. By using some methods students and lecturers can connect with each other such as Video Types, CD-ROM, Video conferencing, text, and graphics audio and so on. E-learning is a subset of distance learning platform which is very famous in these days because of the technological developments so that by using this platform it is very easy to reach students/lecturers

at anytime, anywhere without having distance or time-consuming problem. After development of network technologies which are defined as internet, intranet and extranet, E-learning platforms are shown up faster than before such as Moodle, Udemy, Teachable, Educadium, Ruzuku, Course Craft and many more.

Studies show that critical success factors of E-learning platform have 6 dimensions shown below:

- Characteristics of Learners
- Characteristics of Instructors
- Service Quality
- Infrastructure
- System Quality
- Information Quality

According to some other studies success factors of E-learning platforms can be changed by student/user characteristics; their technology knowledge and skills, requirements of computer trainings, motivations and other social factors.

For this reason, this research demonstrates that to develop a successful E-learning Platform so as to increase student's education, there are main factors that must be applied in the system.

For Developers;

- System Quality
- Infrastructure
- Service Quality
- System-Design

For Institutions;

- Technology Knowledge
- Skills
- Trainings
- Motivations and other factors

In 1975, Fishbein &Arjen developed theory of reasoned action (TRA). TRA is a model which is related to social psychology. It simply explains that human behaviour

is related to their own believes and subjective norms, therefore, can be determined. So, based on this theory, Davis derived TAM model in 1989.

Technology Acceptance Model is a model which is used to determine user acceptance of the new user information system, and is also beneficial for determining the usage of technology according to the user perception.

The main purpose of TAM is to provide a basis for tracing the impact of external factors on internal beliefs, attitudes, and intention. Davis et al. argue that researchers can use TAM to determine the aspects of a system that the users find unacceptable and then take corrective action to correct the identified issues.

TAM model has prediction factors which are defined as;

- Perceived usefulness (PU)
- Perceived Ease of Use (PEOU)
- Attitude Toward Using (ATT)
- Behavioural Intention (BI)

Some studies show that TAM factors are not reliable factors and most of the studies only examined subjective measurements instead of objective measurements of actual system usage. TAM model does not fully fit with the actual usage of the system because the findings that we have got from TAM model are not matching with the reality for example; Keung, Jeffery, and Kitchenham (2004) perform a follow-up study of the acceptance of new software cost estimation technology in small software organizations. Keung et al. explain the initial TAM results indicated that users held positive indications about adopting the software.

The actual usage results one year after implementing the new software showed almost zero usage so that the TAM model might not give a correct prediction of the new system usage unless people who will use the new technologies have an experience. When we apply this model in e-learning based Technologies to understand the level of acceptance, satisfaction and intention to use e-learning platform, S. Y. Park (2009). We see that unclear materials and low instruction quality affect the student's PEOU.

According to Lee et al. (2005) Perceived Ease of Use is not the main contributor but it gets indirectly effected by BI and PU. On the other hand, Mun and Hwang (2003) made a research about Blackboard by using the TAM model and they found out that

enjoyment and self-efficacy are main factors for user acceptance level and also note that ease of use is not the main factor in this case. In another study which is made by Ngai et al. (2007) to determine acceptance level Web CT in higher education, the results Show that technical support plays a significant role for the acceptance level of this technology.

As a result, when a research about E-learning System and determining a satisfaction level of the systems was made by using TAM model, results has shown that in each study there are different scenarios that come off because of different user characteristics/ backgrounds and cultural differences.

CHAPTER 3

THE EFFECT OF CULTURE ON TAM MODEL

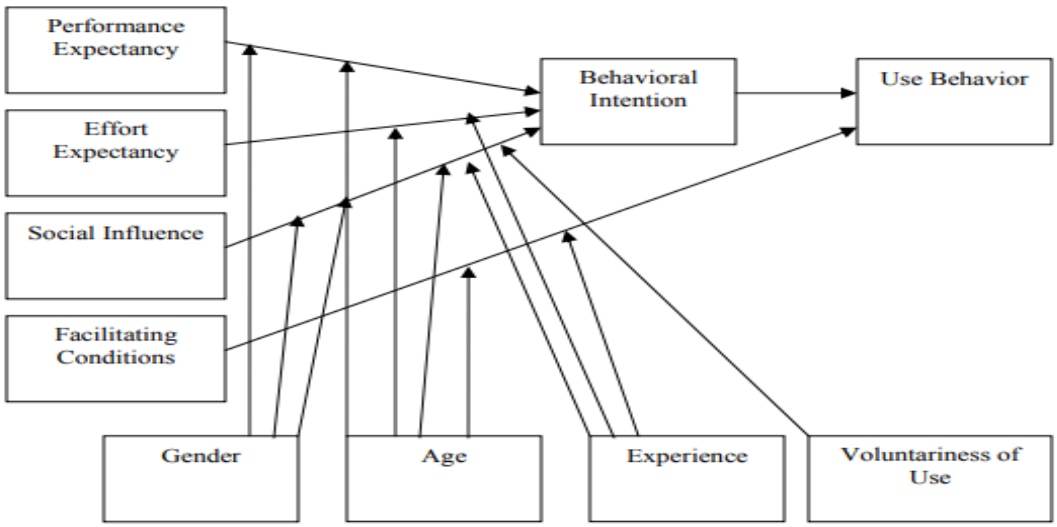

Figure 2: The Unified Theory of Acceptance and Use of Technology (UTAUT 2003)

Global Cultural Dimensions

Global cultural dimensions are defined by what is called power distance (PD), individualism and collectivism. Since individualism and collectivism are opposite aspects of the society, finding only one of them leads to the definition of the other. These terms are further elaborated in this section.

Power Distance

This term refers to existing power is distributed in society in different levels. Simply, in a high power distance culture, people accept that the relationship among bosses and subordinates is one of dependence but when it comes to low power distance culture society. The relationship between bosses and subordinates is one of

interdependence. For example, Australia is one of the countries which has low power distance but Asian countries such as china, Malaysia has culture of high PD.On the other hand, in lower power distance countries people have the courage to take responsibilities for their private and professional life compared to other countries.

On the other hand, in lower power distance countries people have the courage to take responsibilities for their private and professional life compared to other countries where there is a high power distance; so for this reason, people in low power distance cultures such as USA, Germany, Norway, have more confidence about themselves and also can generate realistic solutions for their professional and social life problems.

Examples of low power distance cultures:

- The Netherlands
- The UK & USA
- Germany
- Nordic countries

Examples of high-power distance cultures:

- Belgium
- France
- Malaysia
- The Arab World

Collectivism

Refers to achieve success as a community or a group of people rather than individual. People in a collectivistic culture like Japan, Korea, and Pakistan generally care about their community expectations. Being an individual in such countries does not mean to achieve success as your own. They believe in the subjugation of the individual to a group, which can be tribe, family, party, society. For the collective good of the people, sacrifices are made for everyone's individualistic aims.

Individualism

The core elements of individualism stand on moral right, to pursue one's happiness. People who grew up in countries like North America, France, Germany, Norway, Switzerland and so on have strong individualistic characters that lead them to put themselves along with their interests first.

Cultural Analyses of Some Countries

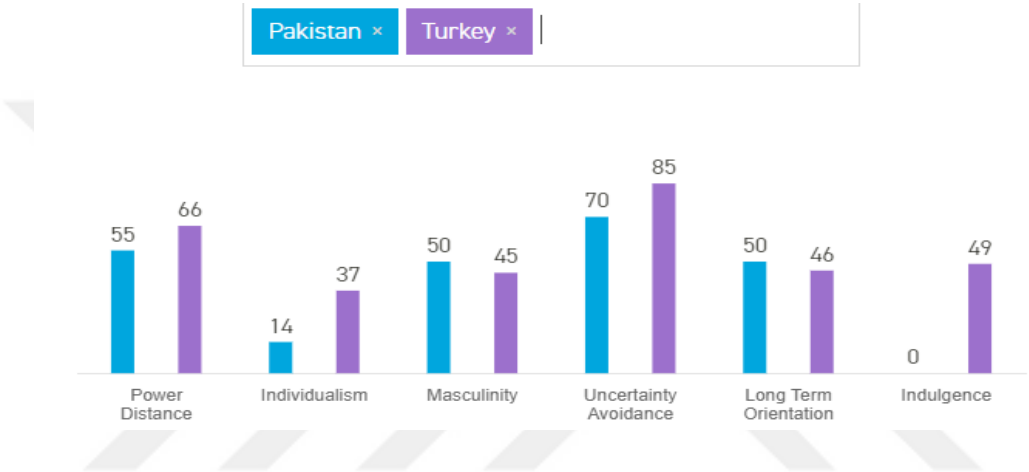

Figure 3 Country Comparison Hofstede Insights

Pakistan is considered one of the highest PD and Collectivistic countries. As a result, applying basic E-learning models may not be successful for Pakistan culture for example. On the other side of the scale, the U.K and other similar cultural characteristic countries can successfully use basic e-learning models (Khan, et al., 2013). It world widely acknowledged that success of e-learning systems is not only related to technological components or accessibility of systems, but also related to cultural, social background of the users (Nawaz, 2013). Another study suggests that the role of parents and other members of the society is a very important factor to influence the acceptance level of the e-learning portals (Maldonado, et al., 2011).

Turkey has high PD and Collectivistic culture when compared to other European countries. According to the study of online learning attitude of foreign language students, more than 50 % of students had positive results of using the system (Cinkara & Bagceci 2013) but it is also suggested that to get better analysis and

results next study should be applied to students who has similar characteristics and cultural backgrounds because of mandatory usage issues.

The TAM model is criticized for its inability to explain the real acceptance level of usage in mandatory settings (Ghazizadeh et al., 2012). Another research which is about E-Government Portal in Turkey claim that mandatory usage has positive effects on actual usage (Sebetci, Özel. 2015), and also claims that perceived usefulness had a positive and direct effect on actual usage besides that ease of use is not an important factor for users because most of the users believe that the system is not easy though the actual usage of the system is high.Davis and Venkatesh reported that social norms are more important factors to determine acceptance level of the system (Lucas and Spitler, 1999 p.304 and Venkatesh and Davis, 2000 p.197).

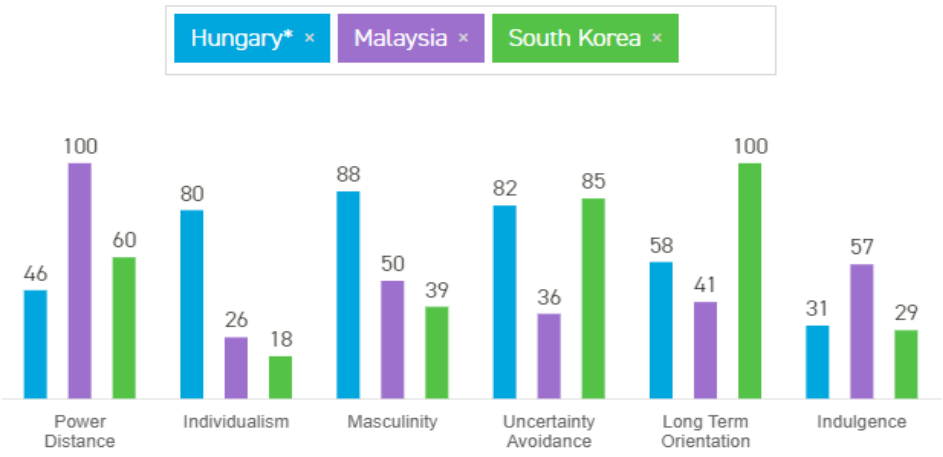

Figure 4 Country Comparison Hofstede Insights

As demonstrated in the above Figure 4, from the differences between these three countries, Korea has a high PD and collectivistic cultural background. Also, one of the researches suggests that subjective norms play a significant role of accepting the new technology. The social influence factors can create a pressure for the people who use new technologies. For example, “people feel emotionally afraid of falling behind other students who use e-learning, if they don’t take e-learning courses. (Park, S. Y. 2009)”. Other research about health care system in Malaysia and Korea reported that TAM model is an effective model to determine acceptance level of new health care technology. However, the results show that most of the students reported that one of the reasons pushing them to accept using web module for new health care technology system for its benefits to their relatives/parents because their relatives and parents

can feel more safe and secure about their children situation (Mai NEO& Heykyung PARK& J. Yuan SOH. 2015).

A study of e-learning for Hungarian students reported that Perceived usefulness has strongest influence on video usage. Perceived ease of use does not effect on video usage in a direct way, this results can be explained by video usage for educational reasons is easier than other methods on e-learning and also students think that video usage for their study can make them achieve better results and improve their study level and performance, Judit T. Nagy (2018).

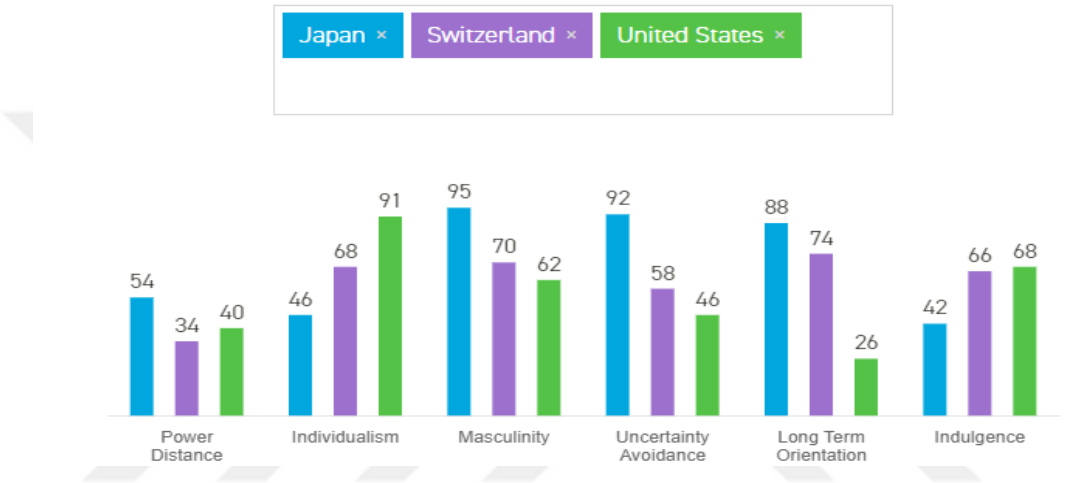

Figure 5 Country Comparison Hofstede Insights

In the above figure, the cultural differences between these three countries (USA, Switzerland, Japan) can be noticed and according to Straub et al. (1997) TAM is suitable for the United States and Switzerland, but not for Japan. Straub et al. note that Japan's cultural tendencies of more uncertainty avoidance and greater power distance are different from those of the other two countries. In the USA and Switzerland users focus on PEOU and PU while their counterparts in Japan focus more on environmental factors.

3.1 Applicability of TAM in Different Cultures

The nature of culture is that even though it tends to change over long periods of time, its core values tend to remain static and so, meteorically, it does not change when exposed to different cultures- as constantly happening in today's world. Culture is one of the most important components and influencers -almost a lensing effect, when

it comes to several mental processes such as cognition, memory, perception, problem solving and the like (Matsumoto, 1996).

Henrich, Heine, and Norenzayan (2010) and Matsumoto (1996) in their studies have observed that even perceptions of geometrical shapes and illusions differ from a culture to another. For example, westerners are generally exposed to straight, rectangular, manmade objects in their daily lives. They can more readily distinguish that Line A is shorter than Line B when shown. Indians, New Guineans and Pacific Islanders are more familiar with natural, curvy, uneven shapes that they come across in their environment, consequently cannot classify line length as well.In a western setting, addressing a person by their first name, the 'I-You stance', suggests an equal status between the parties even though the lecturer predictably stands in a higher position. Online learning is mostly composed of a text material and self-learning as a part of the educational routine, while in cultures with the 'We-They' stance, things work differently. As Özkul and Aoki (2006) have observed in their Asia study, Japanese lecturers prefer video conference to plain text as synchronicity delivers the hierarchy and personal touch of the culture.

From one side, In Asia, age and social status are big factors in learning behavior; students usually respect the opinion and information given by their lecturers more than theirs. Instructors are also expected to lead the students in a pedagogical path, observe and instruct them. This finding corresponds with what Wang (2006) has found, as Chinese teachers often find it difficult to balance between the lecturer-oriented method and the more intuitive, creative student-oriented path that demands more input from the student. Researchers Downey, Wentling, and Wadsworth in their 2005 study did interviews with an international group of instructors to offer a proportional relationship between national culture and usability of an e-learning system. They recommend the e-learning service providers to consider tuning their products to better satisfy the expected level of leadership and consulting by the students. Students from more power-centric societies will be demanding more input and control from their teachers. This approach may increase the ease of use and content diffusion of the online learning services.

In contrast, students hailing from more power-distributed societies might feel more comfortable in a more student-centred setting. These students will be more motivated when given assessments that measure self-quality, competition fosters more effort.

Commanding one's own learning tempo might be more beneficial contrary to more collectivistic approaches where collaboration, group identify and group work delivers a more optimized tempo.

Human culture is the main determinant of how people perceive reality and decide on how to act on it. This will translate into consumption habits of users and their relationship with technology. Geography is also a big indicator as people in different locations tend to have different needs and value systems.

Jared Diamond has firmly demonstrated that throughout history, humans were obliged to tailor their living styles according to their environment and in turn, developed technology in order to manipulate the very environment they depended on. That is why it is important to understand the relationship between technology, culture and the environment. Sociologically speaking, as an attribute, human societies can broadly be distributed into two different categories, namely the previously mentioned individualism versus collectivism. In this context, individualism/ collectivism is a cultural dimension that measures "the degree of interdependence a society maintains among individuals" (Hofstede, 1984a, p. 83). It has been shown that people who live in western cultures have a higher level of individualism, and people who live in non-western cultures have more collectivistic characters (Hofstede, 1995). The meaning of individualism revolves around the concept of taking care of the self before others, while, collectivism is more like having importance of the group and society over an individual's objectives. A variety of surveys have looked into the influence of collectivism and individualism with regards to "adoption and diffusion" (Leidner & Keyworth, 2006) to assert that individualism versus collectivism behavior should also be taken into consideration in the Information Technology field. The reason is that culture itself is a variant of the utmost importance in the IT domain (Baptista & Oliviera, 2015; Srite & Karahanna, 2006). As contemplating on culture is mostly a normative endeavor, it is hard to put it in numbers. However, three types of IT user profiles were suggested by Walsh et al. (2010) depending on their manner of engagement: one that is driven by a pro-active involvement, another characterized by a passive involvement, and people who refuse to adopt the technology. The success of e-learning products is that systems are quite dependent on the degree of users' collectivism versus individualism. As Dutch social psychologist Geert Hofstede stated in his stellar work of 1984b, individualistic

societies lean toward individualistic interests, ergo a proportionality in the adoption of technology.

Researchers note that the need to explore TAM in different cultures using Hofstede's (1980, 1984) cultural dimensions (McCoy et al., 2007; Straub et al., 1997) other than in the North American context where it was developed because predictions are not consistent. For example, Straub et al. (1997) confirm that TAM is suitable for the United States and Switzerland, but not for Japan. Straub et al. note that Japan's cultural tendencies of more uncertainty avoidance and greater power distance are different from those of the other two countries. McCoy et al. (2007) evaluated TAM using respondents from 24 different countries. McCoy et al. tested the significant path coefficients to the TAM relationships of PU → BI, PEOU → BI, and PEOU → PU according to the four cultural dimensions of uncertainty avoidance (UA), power distance (PD), masculinity/femininity (MF), and individualism/collectivism (IC). Knowing that TAM failed for individuals low in UA could be an important clue that only certain people are sensitive to PU and PEU. Likewise, the failure of key TAM relationships for individuals with high PD, individuals high in Masculinity, and individuals high in Collectivism provides further clues of differences in user sensitivity to TAM constructs. (McCoy et al., 2007, p. 88) Conversely, studies show researchers using TAM in diverse cultural contexts, including Africa (I. T. Brown, 2002; N. Park et al., 2009), Asia (S. Y. Park, 2009; T. Teo,2011), Australia (Rawstorne et al., 2000), Europe (Padilla-MeléNdez et al., 2013; Roca et al., 2006; Šumak et al., 2011), the Middle East (Baker et al., 2010; Tarhini et al., 2013,2014), and North America (Agarwal & Karahanna, 2000; Kelly, 2014; Yang & Yoo,2004). TAM studies in non-North American contexts range from determining if the model applies to a specific culture to studies that do not mention any cultural implications.

The first category is researchers who focus on discovering if TAM applies to a particular context (Al-Gahtani, 2001, 2016; Tarhini et al., 2017). Next are studies that give attention to cultural aspects or confirm that the context is suitable to TAM based on prior research (Alharbi & Drew, 2014; I. T. Brown, 2002). A third category is those who merely mention limitations of TAM in different cultures (Hsu & Lu, 2004; T. Teo, 2010; Wu et al., 2010) but operate assuming that TAM produces valid results. The final category of TAM studies in non-North American contexts makes no mention of cultural aspects (Lee et al., 2005; Ngai et al., 2007; N. Park et al., 2009;

Šumak et al., 2011). Examples of using TAM in different cultures include Chen et al. (2017) who used an extended TAM to investigate WeChat gamers in Mainland China for the determinants that affect user intention to engage in mobile social gaming. Ngai et al. (2007) used TAM to examine student acceptance of WebCT in Hong Kong. Using TAM, S. Y. Park (2009) analysed South Korean students' behavioural intention to use e-learning. In Singapore schools, T. Teo (2011) used TAM to evaluate the factors that influence teachers to use technology.

Park et al. (2009) used TAM to assess user acceptance in developing countries, which included participants in Africa, Asia, and Central and South America. Furthermore, researchers have conducted TAM studies on LMSs in Saudi Arabia (Al-Gahtani, 2016; Alharbi&Drew, 2014). Some studies that test TAM in cultures different from North America confirm the model's use in that context without modification. One example is Al-Gahtani's (2001) investigation on the applicability of TAM outside of North America using the United Kingdom as the context for the study. Al-Gahtani reports that the results of the research confirmed that TAM is applicable in the UK, and the analysis is consistent with prior research. Principally, Al-Gahtani details that (a) "perceived usefulness is a key intervening variable that links external variables with perceived ease of use, attitudes, and IT acceptance," (b) "perceived ease of use has a strong positive effect on perceived usefulness," and (c) "perceived usefulness has a stronger positive effect on attitudes toward using" (2001, p. 44). Other examples are studies in Lebanon (Tarhini et al., 2013,2017) that seek to test the moderating factors of the culture by exploring the social norm and quality of work life. Tarhini conclude that their research "supports the applicability and validity of TAM in an educational context and in the developing countries" (2013, p. 736). Their (2017) study concludes that "TAM is applicable to e-learning acceptance within the Arab culture, exemplified here in Lebanon" (2017, pp. 321–322). Some studies show results that are different than expected, such as I. T. Brown's (2002) results which indicate that PEOU has stronger relevance than PU in South Africa. He explains that researchers have extensively studied the PEOU factor in commercial environments or developed countries, but there is a lack of research on PEOU in developing countries. I.T. Brown (2002) investigated the effect of PEOU of web-based technologies in a South African learning environment. The participants were first-year university students with limited experience in internet technologies, and the

majority were studying in a foreign tongue. I.T. Brown's (2002) conclusions show that PEOU is the dominant factor, outweighing PU. The relevant PEOU features for a web-based learning context where students are functioning in a non-native language are "technology characteristics (ease of finding and ease of understanding) and individual user characteristics (self-efficacy and computer anxiety)" (I. T. Brown, 2002, p. 12). To address the results that "ease of finding and ease of understanding were significant influences on perceived ease of use" (I. T. Brown, 2002, p. 11), the study recommends implementing web-based systems that are easy to navigate. Additionally, the research suggests creating instructional material that uses text that one can easily understand or to provide additional explanations for unfamiliar terms and avoid colloquialisms (I. T. Brown, 2002). Researchers using TAM with cultural dimensions different from that of North America do not give adequate attention to discussing the impact of culture on TAM Fifteen of the thirty-one TAM studies made zero mention of culture or culture-related implications.

Four studies had at least one citation to address a cultural issue of the context. Five of the studies included "culture" in the limitations of the study but did not include any citations or specifics. For example, a study in Singapore states that "Such cross-cultural studies have the potential to not only validate the applicability of the TAM in different cultures but add insights to our understanding of technology acceptance by educational users from different cultures" (T. Teo, 2010, p. 77). An investigation in Taiwan concluded that "Other samples from different nations, cultures, and contexts should be gathered to confirm and refine the findings of this study" (Wu et al., 2010, p. 163).

Additionally, a study from Spain noted limitations to include that"users were from different countries, cultural differences might be reflected in our results, thus, users may vary considerably from culture to culture in satisfaction formation and technology acceptance" (Roca et al., 2006, p. 693)

The studies suggest that the TAM Model is not fully applicable on persons rated as high masculinity, high collectivism, high PD and high UA. These differences are summarized as follows:

Essential TAM relationships do get distorted by a low UA (Hofstede G 2001). The characteristic TAM relationships do not hold for those having a low UA score, common sense would also concur. PU and PEOU are measured but failed to predict

BI. Moreover, in a low UA sample, the PEOU failed to predict PU as well. The interpretation of this is that persons rated low UA do not necessarily crave seek the added assurance of usefulness and the ease of use which are demonstrated by persons rated high on UA. Furthermore, with persons of low UA, present PEOU seems not to influence the PU in a significant manner (Hofstede, G 1984). Suffice to say that people (consumers) are immune to the lure of PEOU when they are, as humanly, avoiding uncertainty of a new technology acceptance. High PD moreover is also unsurprisingly a disruptor on PEOU to BI and PU to BI. The hypothesis here being individuals that exhibit a high PD will not necessarily require the added attraction of usefulness and ease of use in order to start using the product. The recommendation alone is sufficing to attract these kinds of users. This is a most interesting finding indeed and we can clearly see its utilization in today's IT marketplace. A ubiquitous example being app stores that immediately expose potential users to the comments section. Ratings with regards to apps also play a part in ATT. As expected with regards to BI, with users rated as high on masculinity will not easily be impressed by PEOU effects. The interpretation being, that High-M users are more interested in their immediate need for realization in contrast to how that realize their mission, ergo ease of use. High masculinity means an elevated self-confidence hence leads those individuals into a confidence in utility of the system. Scoring high on collectivism also disrupted PEOU to BI pathway. A high collectivism may get into the way of optimal usability as achieving the common goal best also means lowering the maximal individual potential. These individuals will naturally tend to emphasize more the needs of others (coworkers and the higher ups in the work hierarchy), inhibiting a pristine experience with the system.

Summary of these findings indicate a general pattern, that application of TAM in societies with high collectivism, high PD, high masculinity and a low UA is, at best, should be taken with a grain of salt. This does not mean however the endeavor to understand the mechanics of TAM is useless, as interpretation of the behavioral patterns of these users can result in introduction of other alternatives to TAM constructs.

Enhanced models will definitely be more beneficial in alleviating above mentioned negative effects and benefit the user. In any case, the model parameters are simple enough, the underlying psychological patterns are demonstrated and the

interpretation of data is comprehensible and backed with real life observations of correlation. Table 1 identifies several countries where significant portions of TAM may not hold and the reasons for the probable failure of TAM.

The countries listed in this table have been shown to have a majority of people with culturally similar orientations to those in the current sample where the paths in TAM were not significant. Clearly the biggest challenge being a low score UA, nullifying the trivet of the TAM (Hofstede, G, 1984). There were difficulties with the paths of PU to BI and PEOU to BI in those scoring high on PD. The path of PEOU to BI did not hold for those scoring high on Masculinity or those scoring high on Collectivism. The cultural factors might be an ersatz for TAM constructs else can be the suppressors their sequence of impact.

Table 1 Countries with people scoring where TAM was not fully supported, Source: Reference Hofstede (1980, 1984, and 2001)

Country	*Orientation where TAM did not hold*
Hong Kong	UA Low
Sweden	UA Low
Denmark	UA Low
Jamaica	UA Low
Singapore	UA Low
Malaysia	PD High
Panama	PD High
Guatemala	PD High
Philippines	PD High
Mexico	PD High
Japan	MF High (more masculine)
Austria	MF High (more masculine)
Venezuela	MF High (more masculine)
Switzerland	MF High (more masculine)
Italy	MF High (more masculine)
Colombia	IC High (more collective)
Venezuela	IC High (more collective)
Panama	IC High (more collective)
Ecuador	IC High (more collective)
Guatemala	IC High (more collective)

3.2 The Influence of Culture on TAM

Huang, Lu, & Wong (2003) explore the impact of PD in the People's Republic of China. Their operating definition of PD is "the extent to which unequal distribution of power in an organization is accepted by members of the organization" (2003, p. 93). Their findings show that high PD can negatively influence the PU value of a specific technology. For example, Huang et al. theorize that "an individual's

perception of PD in workplaces may render him or her to think that the use of email is not desirable [because] email may reduce reverence to superiors or make superiors feel less authoritative" (Huang et al., 2003, p. 98). The work of Huang et al. (2003) supports McCoy et al. (2007) by showing that PU and PEOU are not accurate predictors of BI in cultures with high PD. Abbasi, Tarhini, Elyas, and Shah (2015) sought to determine the impact of individualism and collectivism on TAM by using participants in the collectivist cultures of Pakistan and Turkey. They work under the theory that the belief in PU influences the behaviour of persons in individualistic cultures, and conversely, that PEOU is a better predictor of usage for individuals in collectivistic cultures because "decisions to accept something is based on the group's decision" (2015, p. 752). First, they conclude that PU had a strong effect on BI, which "suggests that individuals are likely to accept technology because of the functions it performs (i.e., relative advantages)" (2015, p. 760). Then, they note the insignificance of PEOU on BI and explain that individuals were accepting to use the technology because of its functionality and utility regardless of how hard its usage could be (Abbasi et al., 2015). On one side, the work of Abbasi et al. (2015) supports McCoy et al. (2007) by confirming PEOU is not an accurate predictor of BI in cultures that has a high rate of collectivism. On the other side, Sánchez-Franco, Martínez-López, & Martín-Velicia (2009) evaluated the impact of individualism and uncertainty avoidance on a user's attitude about web-based electronic learning. They used Hofstede's (1991) dimension of uncertainty avoidance, which is "the extent to which the members of a culture feel threatened by uncertain or unknown situations" and work under the assumption that educators in a high uncertainty avoidance culture "are more likely to avoid accepting ICT because of the uncertainty and ambiguity involved" (Sánchez-Franco et al., 2009, p. 591). Their research concludes that PEOU has a negative effect on BI. In practical terms, they elaborate that "uncertainty avoidance societies may not be willing to accept a difficult and irritating interface" (Sánchez-Franco et al., 2009, p. 596), which supports McCoy et al.'s (2007) work that claims PEOU is not an accurate predictor of BI in cultures with uncertainty avoidance. Contrary to McCoy et al., Sánchez-Franco et al.'s study showed that PU is a strong predictor of BI.

On another level, Srite & Karahanna (2006) determined the impact of masculinity/femininity values on technology acceptance. They describe individuals

with masculine values as those who "emphasize work goals such as earnings, advancement, competitiveness, performance, and assertiveness" (2006, p. 682).

Conversely, Srite & Karahanna describe those with feminine values as tending "to emphasize personal goals such as a friendly atmosphere, comfortable work environment, quality of life, and warm personal relationships" (2006, p. 682).

More findings reveal that "masculinity/femininity values did not moderate the relationship between perceived usefulness and behavioural intention," but moderated "the relationship between perceived ease of use and behavioural intention" (Srite & Karahanna, 2006, p. 679). These results support McCoy et al. (2007) by confirming that PEOU is not an accurate predictor of BI in high masculine cultures.

Table 2 Cultural Differences -Country Comparison,
Reference : www.hofstede-insights.com/country-comparison/

COUNTRIES	**POWER DISTANCE %**	**INDIVIDUALISM %**	**COLLECTIVISM %**	**TAM BASIC MODEL (1/0)**	**REFERENCES**
PAKISTAN	55	14	86	0	Khan, A. S. & Nawaz, A, (2012-2013), Maldonado, U. P. T, Khan, G. F. Moon, J. & Rho, J. J, (2011), Nawaz, A. & Kundi, G. M. (2010), Abbasi, M. S(2015),
TURKEY	66	37	63	0	E.Tercan&S.Varol (2010), TOJET(2015), E Cinkara & Bagceci (2013) , Sebetci, Özel. (2015), Abbasi (2015)
USA	40	91	9	1	Detmar Straub&Mark Keil (1997), Al-Gahtani, S. S. (2001)
JAPAN	54	46	54	0	Detmar Straub&Mark Keil (1997), McCoy(2007), Huang(2003)
SWITZERLAND	34	68	32	1	Detmar Straub&Mark Keil (1997)
CHINA	80	20	80	0	McCoy, S. Galletta, D. F. & King, W. R. (2007), Huang(2003)
SOUTH KOREA	60	18	82	0	Park, S. Y. (2009)
UNITED KINGDOM	35	89	11	1	Al-Gahtani, S. S. (2001)
LEBANON	75	40	60	1	Tarhini, A., Hone, K., & Liu, X. (2013), Tarhini, A., Hone, K., & Liu, X. (2015)
SPAIN	57	51	49	0	Roca, J. C., Chiu, C.-M., & Martínez, F. J. (2006)
MALAYSIA	100	26	84	0	McCoy, S, Galletta, D. F. & King, W. R. (2007)

As we can see in Table 2, the cultural differences between countries and TAM model studies are listed and the result of this model is given by 1/0, 0 refers to a negative result, 1 refers to a positive result which simply means the countries which have high PD more than 50% and individualistic level is less than 50%. The basic TAM model may not be sufficient to be applied in order to determine the acceptance level of new technologies. The countries where there are low PD, less than 50 %, and individualism level is more than %50, the basic TAM model may give more reliable results in comparison with other countries.

In this study, the only country where there is a high PD, more than %50, and where collectivism level is more than %50 is Lebanon and according to the previous studies, researchers claim that TAM model is an effective model to predict acceptance level of new technologies. Besides, to get more reliable information about Lebanon we should analyse more TAM model studies that are applied there.

3.3 Further Analysis

As a follow up analysis, we have tried logistic regression to test dependencies of TAM's applicability to cultural dimensions i.e. PD, I and C. We have used a software package, SPSS, to construct a logistic regression statistical model.

3.3.1 Result of Logistic Regression

Table 3 Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	11	100.0
	Missing Cases	0	.0
	Total	11	100.0
Unselected Cases		0	.0
Total		11	100.0

a. If weight is in effect, see classification table for the total number of cases.

Table 4 the Output of Logistic Regression

Notes

Output Created		23-FEB-2020 21:35:10
Comments		
Input	Active Dataset	DataSet3
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	11
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing
Syntax		LOGISTIC REGRESSION VARIABLES TB /METHOD=ENTER PD I C /SAVE=PGROUP /PRINT=CI(95) /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).
Resources	Processor Time	00:00:00.01
	Elapsed Time	00:00:00.00
Variables Created or Modified	PGR_1	Predicted group

Table 5 Dependent Variable Encoding

Original Value	Internal Value
.00	0
1.00	1

Block 0: Beginning Block

Table 6 Classification

		Observed	Predicted		
			TB		Percentage Correct
			.00	1.00	
Step 0	TB	.00	7	0	100.0
		1.00	4	0	.0
	Overall Percentage				63.6

a. Constant is included in the model.

b. The cut value is .500

Table 7 Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.560	.627	.797	1	.372	.571

Table 8 Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	PD	3.190	1	.074
		I	6.601	1	.010
		C	6.630	1	.010
	Overall Statistics		6.712	3	.082

Block 1: Method = Enter

Table 9 Omnibus Test of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	14.421	3	.002
	Block	14.421	3	.002
	Model	14.421	3	.002

Table10 Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	.000[a]	.730	1.000

a. Estimation terminated at iteration number 20 because maximum iterations has been reached. Final solution cannot be found.

Table 11 Classification

	Observed		Predicted		
			TB		Percentage Correct
			.00	1.00	
Step 1	TB	.00	7	0	100.0
		1.00	0	4	100.0
	Overall Percentage				100.0

a. The cut value is .500

Table 12 Variables in the Equation

a. Variable(s) entered on step 1: PD, I, C.

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
							Lower	Upper
PD	15.950	1201.368	.000	1	.989	8454309.017	.000	.
I	12.542	4181.602	.000	1	.998	279788.427	.000	.
C	-10.820	4087.139	.000	1	.998	.000	.000	.
Constant	-1033.407	413866.365	.000	1	.998	.000		

The result of logistic regression yielded no meaningful output; hence, we may not formulize TAM applicability in terms of PD, I or C. This result is due to insufficient available data, mainly; this is further expressed in upcoming works, Section 4.3.

3.4 Result

As seen from the output in Section 3.3, a rigorous model could not be established i.e. statistically we fail to express applicability of TAM in terms of cultural dimensions. However, Section 3.2 shows that, applying the basic TAM for all countries without considering their cultural backgrounds can lead us in the wrong direction. We should update TAM model for each country by considering their cultural differences then we can expect to get a beneficial determination for the acceptance level of new technologies.

CHAPTER 4

CONCLUSION

4.1 Findings (F)

F1: TAM MODEL DOES NOT ALWAYS PREDICT USER ACCEPTANCE IN A CONTEXT WHERE USERS COME FROM A HIGH POWER DISTANCE (PD) CULTURE

In section 3.1 and 3.2 Hofstede and McCoy's research prove that TAM predictors are not reliable where high PD culture is prevalent, which simply means that TAM predictors are not fully matching for users who have high power distance cultural background.

F2: TAM MODEL PHASES ARE OPEN TO DISCUSSION IN TERMS OF EFFECTIVENESS FOR PREDICTING USER ACCEPTANCE LEVEL IN A CONTEXT WHERE COLLECTIVISM PLAYS A SIGNIFICANT ROLE IN USER'S CULTURAL BACKGROUND.

Section 3.1 explains that people in collectivistic cultures get affected by their environment more than those in an individualistic culture, for this reason, for them, it is of utmost importance to do what their community expects them to do. In other words, their method revolves around how to achieve success as a group, and not as a single person.

F3: PU AND PEOU ARE NOT ALWAYS ACCURATE PREDICTORS OF BI IN CULTURES WITH HIGH PD HOWEVER PEOU CAN BE A BETTER PREDICTOR IN COLLECTIVISITIC CULTURES.

In section 3.1 also according to the research of Huang et al. (2003) and Mc Coy (2007), in cultures where a high level of Power Distance is prevalent, Perceived Usefulness and Perceived Ease of Use are not accurate predictors of BI. On the other hand, People who have a background of collectivistic culture focus on Perceived Ease of Use for observing new technologies.

F4: PEOU CAN HAVE A POSITIVE EFFECT ON PU, AND PEOU MAY HAVE A POSITIVE EFFECT FOR ACCEPTING NEW TECHNOLOGIES

In section 2 (Al-Gahtani, 2016) and Lee at al (2005) find out that PEOU was not a significant contributor to student attitude, but PEOU indirectly influenced behavioural intention through perceived usefulness and perceived enjoyment. Perceived Usefulness is affected by perceived ease of use because if the new technology is easy to use and does not make users consume time to understand how to use this technology, users automatically think that using this system is useful and beneficial for to improve their ability.

F5: EASE OF SYSTEM ACCESS CAN HAVE A POSITIVE EFFECT ON PEOU AND PU

In section 2 Mosa et al.'s (2016) show that internet access, hard-ware, and availability of computers are the main factors that impact the acceptance of the new systems by different users. Chap nick, (2000) lists eight justification factors and which are: psychological, sociological, environmental, human resource, financial, technological skill, equipment, and content readiness.

F6: DOMAIN KNOWLEDGE CAN HAVE A POSITIVE EFFECT ON PEOU

All these sections prove to us that cultural environments and backgrounds affect the usage and acceptance level of the new technologies. So, section 2 and section 3 both demonstrate that domain knowledge is of crucial importance to understand the actual usage level among users.

F7: LACK OF INTUITIVE DESIGN OR UNCLEAR INSTRUCTIONAL MATERIALS CAN EFFECT PEOU

Section 2 shows the importance of design and quality materials that have a significant effect on user's usage of the system, and as we know before PEOU is an important predictor determining the acceptance level of the new technologies by the user's perspective.

4.2 Limitations

There are some limitations of this study that need to be considered and which are listed below.

- While doing research, this thesis has mostly focused on the predictors which are described such as PEOU, PU and BI and on the relations between them. The relation between BI and Actual Behaviour is not covered in this analysis, this part of the research was left for future studies.
- The information for this thesis was gathered from the literature review, so data were not derived from any field survey.

The studies in the literature are not universal because the relevant researchers neither focus on specific fields nor user background characteristics.

4.3 Future Works

- To avoid the abovementioned limitations in future works the following should be taken into consideration:
- The predictors BI and AB and the relations between them should be covered in future studies,
- Data can be gathered and collected from the fields by questioning a group of users through interviews or (semi) structured survey,
- While collecting data, a specific field or industry should be selected for future statistical studies; however, the number of samples is recommended to be large to have meaningful results from, for example, binary logistic correlation.
- Future studies should focus on users who came from the same environment and have the same background in terms of knowledge.

4.4 Conclusion

This study examined user/students' acceptance level of e-learning technology. The study was carried out by considering literature research about this subject.

In this study, the Technology Acceptance Model (TAM) was used as the main factor and tool. TAM theory suggests that there is a direct relationship between Perceived Ease of Use and Perceived Usefulness, and Perceived Usefulness and Behavioural Intention which are consistent with the study (Davis, 1989).

The results showed that while we consider all these relations, most of the research misses a significant part which is cultural differences of users and its effects on the user acceptance level of new technologies. This study shows that TAM theory does not always predict user acceptance if users have high power distance cultural backgrounds such as China, Mexico, Malaysia, France and so on.

Collectivism and Individualism plays a significant role in the culture of users, so it affects their acceptance level of new Technologies for example; user's/students from Turkey, Pakistan, Venezuela, and many others have collectivistic culture and the user's from USA, France, Germany have an individualistic culture. PU and PEOU are not always accurate predictors in the presence of a high PD to estimate BI. PU and PEOU can have a positive effect on accepting new technologies. Ease of system access is the main reason for the user's acceptance level and also has a direct relationship with PEOU and PU. Domain knowledge can have a positive effect on PEOU because when users have basic knowledge of IT, their satisfaction and acceptance level can be higher than others for new technologies. Design and instructional materials of the new system have a significant effect on PEOU because if the design and instructional materials are not clear and effective, users will face difficulties in accepting the new system.

As the result from these studies and research, the answer which can be given to our research question, can TAM be employed in all cultures to understand BI?

There are examples of culture with high PD and/or collectivism in which TAM is not sufficient to predict BI.

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