Investigating the Factors that Affect Peoples' Acceptance of E-Learning Systems and Websites

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ABSTRACT: *The main focus of this paper is to investigate the use of Technology Acceptance Model to understand the factors that affect people's acceptance of E-Learning Systems and Websites, including cultural factors. E-Learning Technologies are in general considered to be useful and important to the learning process. Despite this perceived usefulness, some people are still not adopting the use of E-Learning and considering it to be still not one of the best options for Learning.*

Keywords: Component, Technology Acceptance Model, Cultural Factores

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1. Introduction

Computers technology is now used by all people and not anymore just technical users as in previous decades, so it is therefore important that the technology, computer systems and interfaces for E-Learning are designed to support the expectations, knowledge and skills of their particular users. One of the most important principles in Human Computer Interaction is '*Usability*' which is about designing systems so that they are easy to learn and safe, enjoyable and flexible to use.

Recognising the importance of both Usefulness and Easeof-Use of Technology, the Technology Acceptance Model (TAM) was proposed by [5] as a model that can be used to predict the acceptance of new technology. Another motivation for this research work is the role of culture with particular attention to the Middle East culture.

This paper proposed and evaluated a Technology Acceptance Model for E-Learning, investigated relationships between culture or social factors and the people acceptance of e-Learning systems. Different studies were carried out to compare between two different cultures, to see if social and cultural differences can affect people in accepting E-learning mode of learning. It was found that The (TAM) proposed by [5] was suitable to be used as E-Learning mode of learning. The model can be used to analyse the acceptance of new technology. The TAM proposes that people s intention to use a new technology depends on two main factors: Perceived Usefulness and Perceived Ease of Use. The main cultural factors that were considered

and identified to be used for the E-Learning's TAM are: Tangibility, Subjective Norm, Individualism/Collectivism, Power Distance, and Uncertainty Avoidance.

A Quantitative research method was followed to allow capturing data for both Quantitative and Statistical Analysis. Online Questionnaire was used for this purpose in order to compare between two different Cultures, samples (participants) from UK and Middle-East (Oman) were targeted. In total 62 people took part in the online questionnaire.

2. Techology Acceptance and Culture

There were a number of studies on the Technology Acceptance for E-Business or E-Health [24] [16], but there has been a need for a similar application of Technology Acceptance Studies for E-Learning. Furthermore, it has already been recognised that culture can play an important role in the acceptance of new technologies. In general new technologies have been developed by the West and other developed countries, and therefore these technologies may have been designed to be more suited to the developed countries and not to the culture of the '*Developing*' counties, such as the Middle-East or the Arab World.

According to Fandy [8] many studies have put more importance on technology transfer into the developing countries, but few studies have actually investigated how cultural factors in Arab countries could influence users' acceptance and adoption of new technologies.

A number of studies have linked culture with attitudes towards website usage and acceptance, perceived usefulness, perceived ease of use, website literacy, and website usage [27], and according to Hofstede [14] cultural dimensions and findings. Arab countries are seen to be high uncertainty avoidance cultures. In a high uncertainty avoidance culture, people will tend to consider computer technology to be something new, risky or uncertain, and that they will try to resist the changes in their life and work style and avoid this kind of uncertainty.

Hill, et al, [12] state that Arab people prefer face-to-face communication therefore, they could try to resist new technology that support different way of communication, and argue that the people do not want to replace their traditions, values, and way of life of interactions and caring.

By using TAM, Rose and Straub [22] studied the main factors of technology adoption in five Arab countries. They indicated that perceived ease of use and perceived usefulness, might give support to the adoption of IT in the Arab world. But, Arab culture is collectivist and family oriented in nature that can see websites and the Internet as a possible threat to family and social life.

The aim of this paper is to investigate the use of Technology Acceptance Model to understand the factors that affect people acceptance of E-Learning Systems and Websites.

3. Technology Acceptance

Previous research on Technology Acceptance investigated many issues in user behaviour with "*Technology*", for example Innovation Adoption, User Satisfaction and Social Attitude [17] [28] [29] [9]. In some cases, these factors are combined in order to come up with some Technology acceptance theory [29] [6] [21] [3].

According to [10] [24] [5], the main technology acceptance models and theories are:

- Theory of Reasoned Action
- Theory of Planned Behaviour
- Technology Acceptance Model

The Theory of Reasoned Action [10] proposed that the behaviour of people is mainly affected by their intention to perform that action. For example: the intention to use an Interaction Technology can be predicted by the individual attitude towards that Technology.

The Theory of Reasoned Action is seen as general, since it does not specify the attitudes towards a particular behaviour, such

as using IT, which can then be used to get an idea about the use of IT [24] [5].

Therefore, these parameters need to be specified for each case. Theory of Reasoned Action was extended by [1-2] to bring the theory of Planed Behaviour.

As it can be seen in Figure 1, the theory of planned behaviour "*the Behavioural Intention*", which leads to people performs a particular behaviour, can depend on three main factors:

- The person s attitude towards a particular behaviour to use a system.
- Subjective Norm: a person s expectations about what other people expectation of a particular behaviour.
- Behavioural Control: which depends on whether the person thinks that there are factors that can control or affect the performance of particular behaviour.

These three factors are then combined to affect the intention to behave in a certain way towards the use of a particular system such as Information Technology.

The theory of planned behaviour was still considered to be difficult to use in predicting intentions and behaviours, and it is also difficult to measure some of the main factors, but was seen as better than the Theory of Reasoned Action [19].

3.1 Technology Acceptance Model (TAM)

Technology Acceptance Model (TAM) was proposed by [5], and it is a model that can be used to predict the acceptance of new technology, the intention to use it, which can lead to the use of the new technology. The TAM has been used as the main system for predicting technology acceptance in the field of Information System, because it uses factors that can be more easily measured and it is more specific to apply on new Technologies. This has made TAM more popular than any other earlier theories.

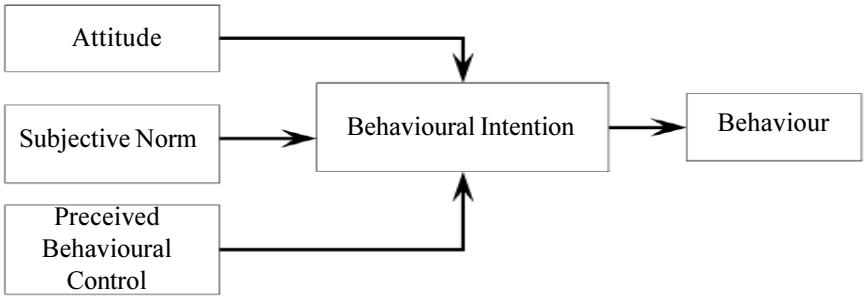

Figure 1. Theory of Planned Behaviour : [19]

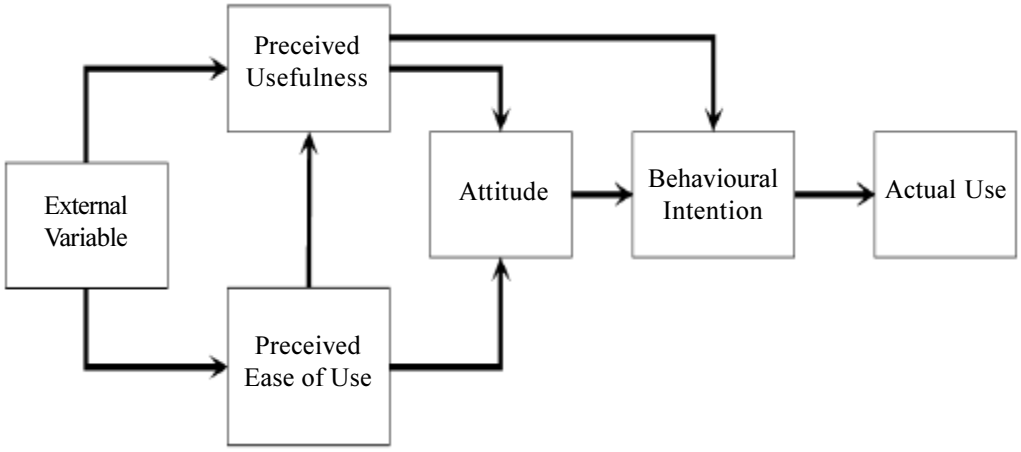

Figure 2. Technology Acceptance Model [5]

The TAM proposed by [5] anticipated that people s attitudes towards a new Technology are depending on the main factors: Perceived Usefulness and Perceived Ease of Use.

Perceived usefulness being how much people think that the new technology will be useful in helping to perform tasks and to achieve the desirable goals or results.

If people perceive a new technology to be useful then they will have a positive attitude towards it, they will be accepting it, intend to use it. This will lead to actually adopting the new technology to be used.

The other factor is Perceived Ease of use, which is to do with how people perceive a technology to be simple to learn and use as well as interesting and attractive, for example by being easy and clear to follow and '*do the job*' quickly and efficiently. If people perceive technology as easy to use, that will develop their attitude and intention to use it and adopt it. Both Perceived Usefulness (PU) & Perceived ease-of-Use (PEOU) are affected variables that can be taken from the Usability & HCI filed.

This makes TAM attractive to many researchers and was subject to different investigations, for the purpose of improving and extending this approach [17] [21] (Gefen & Strab 2000).

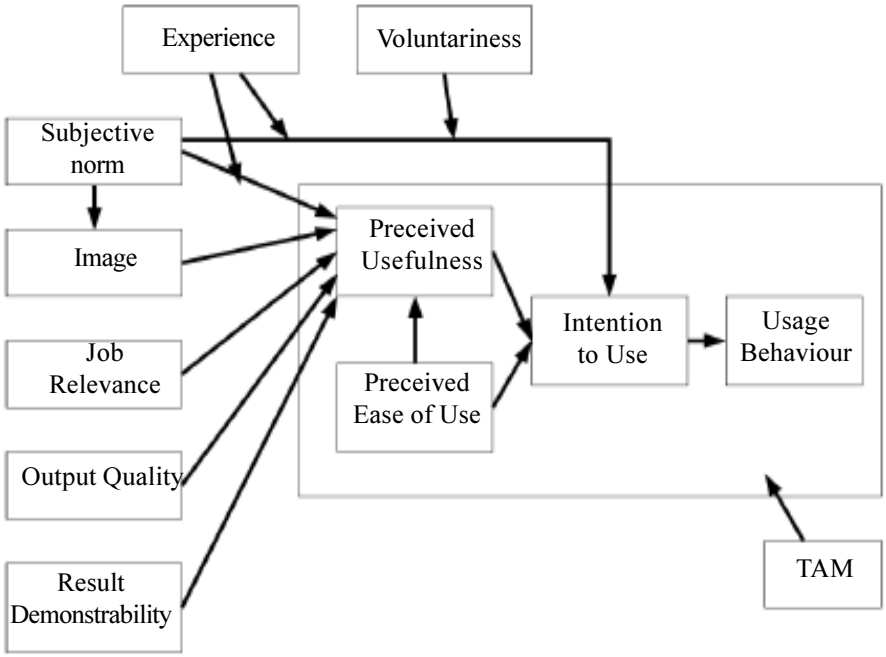

Figure 3. Extended TAM Model (TAM2) [26]

In 2000 (Venkatesh & Davis 2000) proposed an extended TAM model, by adding social factors to affect PU, PEOU and intention to use, as shown in Figure (3). The Extended TAM includes the following social factors that can influence, PU:

- Subjective Norm
- Image
- Voluntariness and Experience „h Output Quality, Job relevance and Results Demonstrability.

4. Cultural Factors and Theories

Cultural factors and cultural issues in different societies and countries have been studied for a long time [4] [3] [11] [25]. It was also noticed that the culture plays a role in the use of technology. Different researchers defined culture in various ways, but in general, they all defined culture to be the behaviour and way of living, in a community or group interact with each other and their environment in which they are brought up, that is influent by very important things such as their traditions, religion, history and language. Therefore, it is important to understand various cultural factors and concepts to see how they can affect peoples

interactive with each other or with technology. Hofstede [14] proposed four dimensions to compare between different cultures, which are the Individualism / Collectivism, Power Distance, Uncertainty Avoidance and Masculinity / Femininity.

4.1 Individualism / Collectivism

This dimension is to do with how individuals are concerned with themselves and others in their group society with high level of Individualism, has its individuals mainly thinking about their own success and take personal decision, and have little loyalty with other individuals, except very close ones such as families. People here use low-context communicative and this individualistic society values the freedom, time and personal and encourages action, taking challenges and change [23] [15].

On the other hand, society with high level of collectivism has strong bonds between its people who would do more social interaction and look after each other and take decision together.

4.2 Power Distance

This dimension is to do with the way different society handles the social inequalities. Societies with high power distance usually have very high leadership powers with central control and many layers in the hierarchy in the organisation in society, people are influenced highly by the leader, or the managers, or the parents [13] [18]. These are usually a large difference states and salary between people with different levels of social status. On the other hand, in societies with Low Power Distance, people there is less central control and Hierocracies layers in organisations and people work closely with their leaders, managers or parent and have some informal relationships with them. These are also less difference in salary or status between people from different social status.

4.3 Uncertainty Avoidance

This dimension is to do with how much people certain culture can tolerate uncertain situations and take risks or action that can have some unpredictable outcomes [20]. Hofstede [13] shows different cultures have different levels on certainty avoidance such that people in cultures with high uncertainty avoidance are more willing to explore unknown situations or approaches. Instead, people in low uncertainty avoidance cultures prefer to stick to what they are familiar with and not take risks or try new situations on.

4.4 Masculinity / Femininity

This dimension is related to how different cultures define the gender roles [13]. Culture which are more masculine, tend to promote competitions, performance and success. In such cultures it is important to be strong, fast, ambitions and it is expected that there are clear gender roles that do not overlap very much [15]. However, cultures with low-masculinity or in other works, high femininity, have more overlapping and less clear cut gender roles and promote beauty collaboration and relationship.

Hofstede s cultural dimension have been widely used by researcher to study cultural factors and difference, one of the main strength of Hofstede s cultural dimension is that they enable study and data analysis to be conducted to quantity and compare these dimensions across different cultures. Hofstede [14] conducted an extension study which compared these four dimensions across many countries and cultures using numerically. Table (I) below show, according to Hofstede s study, the score of UK and Arab countries on various cultural dimensions. This shows how different UK and Arab cultures can be. UK culture is high on Individualism and low on power distance and uncertainty avoidance, while Arab culture is low on Individualism and high on power distance and uncertainty avoidance.

Country	Power Distance	Individualism	Masculinity	Uncertainty Avoidance
United Kingdom	35	89	66	35
Arab World	80	38	52	68

Table 1. Hofstede Cultural Dimensions of UK and ARAB Countries

5. TAM With Cultural Factors

For this research work, Technology Acceptance Model (TAM) has been used for E-Learning that is similar to the original TAM proposed by Davis [5] and also takes the ideas from the Extended TAM [26], which are both explained in the earlier section.

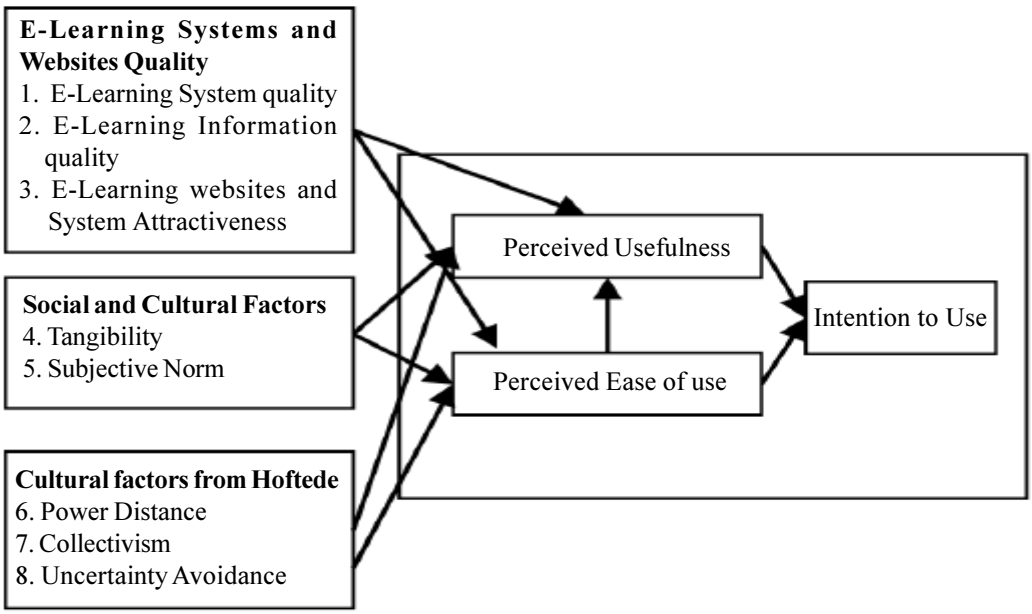

Figure 4. The TAM used for E-Learning, which includes cultural and social factors

The proposed TAM for E-learning includes Cultural and Social factors that can be relevant to E-learning, plus other general E Learning Systems and Websites Quality factors that are also relevant to E-Learning.

The proposed E-Learning TAM that has been developed as part of this research work has also taken ideas from another TAM which has cultural factors and which was used recently to research E-Business Acceptance Khushman [16]. As it can be seen from the Figure 4, the proposed E-Learning TAM has two main parts:

The typical TAM part, which is based on the two factors of '*Perceived Usefulness*' and '*Perceived Ease-of-use*' [5]. Both affecting the '*Intentions to Use*' a particular Technology, which is in this case the E-Learning Systems and Websites. The second part of this E-Learning TAM takes from the idea of Extended TAM [26] by assuming that '*Perceived Ease-of-use*' and '*Perceived Ease-of-use*' are influenced by other factors. In the case of E-learning, we use E-learning System Quality and Cultural factors, similar to the way they were used by the Khushman model [16]. These factors can be presented as follows:

- **E-Learning System and Website Quality**
  - o E-Learning System quality
  - o E-Learning Information quality
  - o E-Learning websites and System Attractiveness
- **Cultural factors**
  - o Tangibility
  - o Subjective Norm
- **Hofsted's cultural factors**
  - o Power Distance
  - o Collectivism
  - o Uncertainty Avoidance

These factors have been used within this research investigation because from the literature and the investigation into E Learning, the authors found that they are more relevant factors to E-Learning, especially with the cultural factors. The authors have also found from the Literature review that two of the most important Social and Cultural factors used are Tangibility and the Social Norm, and they decided to favour these two factors over the '*Trust*' factor because Trust is usually important to look at in the case of Business, Security, Health or similar applications.

For Cultural factor, the other factor that is usually used for research and Evaluation are Hofsted s dimensions. According to Table 1, the UK and the Middle-East cultures have very different scores in terms of the Power Distance, Collectivism Uncertainty Avoidance, but have similar scores for masculinity. This has lead the authors to select Power Distance, Collectivism Uncertainty Avoidance as the Hofsted cultural factors in order to be able to look at how culture can affect E-Learning Technology acceptance.

For the purpose of this study, Quantitative research method has been used to capture data for quantitative and statistical data Analyses. Quantitative analysis has been selected over qualitative analysis or „Mixed analysis as quantitative analysis will help to measure the influence and importance of different factors on E-Learning Technology Acceptance. Furthermore, these factors can be measures numerically,

6. Results and Evaluation

In order to capture data from participants abroad (Middle East) and also to capture data easily from participants in the UK, an Online questionnaire method was used by developing the questionnaire using the QUESTBACK online questionnaire software (questback.com). The advantage of this the online system is the idea of capturing the data electronically and can be saved in different format. Therefore once the questionnaire data is captured and save, it can be exported to software formats such as Excel and SPSS for graphical presentation of the results and data analysis and Statistical analysis.

The online questionnaire is designed to capture all the relevant factors to E-learning technology acceptance in order to use samples of participant from UK and Middle East as the two different cultures, that are studied in this research. The online questionnaire was distributed electronically to students, staff and other professionals in Liverpool to represent the UK culture, and also to students, staff and other professionals in Oman (to represent the Middle-East culture).

In total 62 people took part in the online questionnaire: 30 participants from UK and 32 participants from Middle-East. The general profile of participants were people who were mainly Students, University Staff and other professionals who need to use Learning resources and learning material. The main age groups were between 20 and 39 years old, and the Educational background was usually either High- School or University education. Most of the participants have been using the internet for more than 5 years and more than 10 years.

In General Participant had High intention to use E-Learning and Gender, Age, Educational Background and Internet Experience made very little different to the level of Intention to Use. From the E-Learning TAM, the results indicated that there is a clear POSITIVE relationship between perceived Usefulness of E-Learning, perceived Ease of Use of E-learning, and Intention to use E-Learning. The intention to use E-Learning increases as the increase of Perceived Usefulness of E-Learning increase and perceived Ease of Use of E-learning.

The strongest relationship is between Intention to use and Perceived Usefulness. This makes it possible to say this Technology Acceptance model is valid for E-Learning websites acceptance.

Comparison between UK and Middle-East results show the following differences:

1. Surprisingly, UK sample shows more need for Tangibility compared to Middle-East.

2. Overall, the Middle-East Sample shows slightly more Intention to Use E-Learning compared to the UK samples.

3. Regarding the Cultural Factors, the results showed that there is a POSITIVE relationship between Subjective Norm and Intention to use E-Learning; i.e. people with high subjective Norm show more intention to use E-learning.

Intention to use E-learning has also POSITIVE relationship with E-learning website attractiveness; people who prefer attractive E-learning website, also intend to use E-learning websites.

8. Conclusion

In this paper a research was conducted on the use of Technology Acceptance Model to understand the factors that affect people acceptance of E-Learning Systems and Websites. A Quantitative research method was followed to allow capturing data for both Quantitative and Statistical Analysis. Online Questionnaire was used for this purpose in order to compare between two different Cultures, samples (participants) from UK and Middle-East were targeted. The E-Learning TAM used the results showed that:

The experiments results showed that there is a clear POSITIVE relationship between perceived Usefulness of E-Learning, perceived Ease of Use, and Intention to use E-Learning. Therefore, E-Learning TAM used for this study shows that Intention to Use E-learning systems depend on two main factors of Perceived Usefulness and Perceived Ease of Use of E-Learning Systems and Websites, with Usefulness being even more important, and that Technology Acceptance model is valid for E-Learning Websites acceptance.

Statistical Analysis showed that the Intension to Use E-Learning has positive relationship with the Attractiveness of E-Learning Website quality and the Cultural factor of Subjective Norm. Other cultural factors did not show significant relationship with E Learning Technology Acceptance.

Analysis of the other cultural differences between UK and Middle-East samples show that there is only small difference between the two for the factors of Collectivism, Uncertainty Avoidance, but the analysis of other cultural factors show clearly that Middle-East sample is affected more by the Subjective Norm compared to UK sample. Surprisingly, UK sample shown more need for Tangibility compared to Middle-East.

Analysis of the Hofstede's cultural factors and differences between UK and Middle-East (Oman) samples show that there is only small difference between the two for the factors of Collectivism, Uncertainty Avoidance, but the Analysis of other cultural factors shown clearly that Middle-East sample is affected more by the Subjective Norm compared to UK sample. Surprisingly, UK sample shown more need for Tangibility compared to Middle-East

Overall, The Middle-East samples shows slightly more Intention to Use E-Learning compared to the UK sample, while lower values for Tangibility in the Middle-East could also mean that people there have changed some of their habits and are happier now to use Electronic media instead of just face-to face Interaction in general or for learning in particular.

Lower values for Tangibility in the Middle-East could mean that people there have changed some of their habit and are happier now to use Electronic media instead of just face-to-face Interaction. This could relate to the fact that technology is available and easy to use, Internet is easily accessible, and Middle-east people can now appreciate more the benefit of E-Learning.

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