THE INFLUENCE OF PERCEIVED USEFULNESS, SOCIAL INFLUENCE, INTERNET SELF-EFFICACY AND COMPATIBILITY ON USERS' INTENTIONS TO ADOPT E-LEARNING: INVESTIGATING THE MODERATING EFFECTS OF CULTURE

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Abstract

The current study has been inspired by two significant issues: (1) The proliferation of e-technologies such as e-learning have dramatically motivated global research intended to advance our knowledge of the dynamics of these technologies in varying environmental contexts and settings, and (2) the importance of cultural values at individual-level analysis in technology adoption merits greater level of attention and interests from researchers and practitioners, particularly in relation to developing country contexts. This study intends to investigate the significance of highly influential adoption factors acknowledged as relevant in prior literature in predicting user's behavioral intention to adopt new technologies. These potentially important factors were drawn from highly popular technology adoption and social theories including perceived usefulness (Technology Acceptance Model), social influence (Theory of Planned Behavior), Internet self-efficacy (Social Cognitive Theory) and perceived compatibility (Innovation Diffusion Theory). Further, the present study examines the moderating impact of both individualism-collectivism and uncertainty avoidance cultural dimensions at individual-level on the hypothesized relationships linking these highly influential adoption factors with behavioral intention to adopt e-learning environment in order to facilitate and enhance learning processes and in an effort to achieve value maximization and waste minimization requirements in the context of e-learning technology. The empirical data which consists of 262 valid datasets was collected from undergraduate university students in Jordan via self-administered paper-based questionnaire. The questionnaire was developed from previously accepted and validated a set of measurements items. The empirical data was numerically assessed and analyzed with the help of WarpPLS 5.0. The findings of this study demonstrate that perceived usefulness, social influence, Internet self-efficacy and perceived compatibility are important predictors of individuals' behavioral intention to adopt e-learning technology. Further, the current findings provide adequate empirical evidence to support all hypotheses involving moderating effects with one exception whereby both individualism-collectivism and uncertainty avoidance cultural values have little statistical significance on the relationship linking perceived usefulness with behavioral intention to adopt e-learning technologies. Interestingly, the proposed model explains a substantial amount of variance (63%) which signifies that the model fits the data well. Research findings are discussed and contribution to theory and practice are presented.

Keywords: adoption, e-learning, culture, WarpPLS, Jordan

1. INTRODUCTION

The last three decades have witnessed an amazing trajectory in Information Technology (IT) systems and services that are unparalleled in strength, transformative power, flexibility, innovation, performance, mobility, cost-efficiency, ease-of-use, speed, convenience and environmental friendliness. Certainly, advancements in information technologies have given birth to a new focus called Information Technology and Communication (ICT), particularly the Internet and the web technologies which have opened arrays of new dimensions to information system domains. However, the proper use of ICT-related technologies can create superior value for organizations and citizens alike. Indeed, the innovative use of ICT and associated systems has been attributed to help companies develop, grow and promote their businesses as well as maintain sustainable competitive advantage and drive innovation. In the meantime, various prominent contemporary growth theories have underlined the fact that there exists a positive correlation between ICT and economic growth that leads to improved productivity and economic development (Aghaei and Rezagholizadeh, 2017).

The highly dynamic and fierce competitive business environments have called for full exploitation of the newly emerged innovation of the Internet and its associated systems and applications. Consequently, many companies are pursuing ways and methods to employ the new technological formats in order to leverage digital technologies to achieve numerous objectives. These objectives address a varied number of areas such as: (1) enabling the innovation of the business environment to deploy an enhanced and transformed seamless business processes in order to achieve a sustainable competitive edge and strategic advantage; (2) delivering new innovative products and enhanced services; (3) enabling the transformation of the customer value equation in order to deliver superior business outcomes and superior customer experience; (4) providing further personalization to reach out new customers; (5) creating and exploiting new markets and (6) driving business growth and development in order to meet rising expectations and growing needs (Arshad and Su, 2015; Weinstein, 2016; Johannisson, 2017; Morgan and Vorhies, 2018).

One of the core issues that have been brought about by the new technology is the power of process transformation whereby processes have become better streamlined, more digitized, fast-performing, less-costly, more robust and dynamic, well-integrated, more productive, knowledge-intensive and complaint with value maximization and waste minimization requirements. The educational processes and systems are no exclusion of the impact of digital transformation phenomenon taking place globally nowadays. In fact, traditional learning systems have largely been affected and radically transformed by the wave of digitization, especially in the developed world. Thus, the innovational e-technologies have dramatically transformed learning processes into a more personalized entity. Therefore, the ways in which individuals learn can be fully automated, digitized and virtualized, and apparently these new educational environments and formats are becoming the future development trend. Indeed, educationalists and practitioners are fully aware of the power of this trend in bringing about novel educational contexts and cultures. In fact, e-educational technologies are eagerly taking off, turning completely classrooms into virtualized-based format (Cowie and Sakui, 2015).

Web-based learning technology is a revolutionary change in educational environment that has been brought forth by the innovative power of the Internet and web technologies, and this new innovation will fundamentally eclipse the learning environments of traditional classrooms. The most distinguishing feature of e-learning is convenience because it can be implemented at any environment and at any time; this valuable attribute has been reported to be one of the most important motives for learners to accept Internet-based environments for learning (Salehi et al., 2015). E-learning has been defined in many ways to reflect different perspectives such as educational-driven, technology-driven, delivery-system oriented and communication-oriented. For example, Caporarello and Sarchioni (2014) defined e-learning as a set of models, methodologies and processes for the acquisition and use of knowledge distributed and facilitated primarily by electronic means. Also, in the current undertaking, we define e-learning as an Internet-delivered learning mechanism that sets to enhance effectively and efficiently learning practices through digital transformation and virtualization. It seems that many definitions have been suggested to define e-learning technology. As a result, Sangrà et al. (2012) have tried to enlighten the controversies and challenges surrounding the definition of e-learning by recommending a world-wide accepted definition that satisfies the perceptions and perspectives of scientific community. Sangrà et al. have provided an exclusive definition of e-learning that encompasses all what e-learning needs to enable transformation of traditional educational processes, products, practices and outcomes to digital formats to make them more personalized, convenient, interactive, communicative and accessible. However, many scholars have acknowledged that e-learning and its associated fields will continue to develop, evolve and flourish in the foreseeable future (e.g., Vandenhouten et al., 2014). E-learning concept delivers numerous potential benefits to educational components and systems, particularly with regard to the trilogy of educators, learners, and academic institutions. In addition, e-learning provides exciting features that strongly captivate the attention of educators, learners and other stakeholders and these include convenient, cost- effective, self-paced, personalization, flexibility, responsiveness, enhanced communication and collaboration, accessibility, efficacy, time-saving and interactivity (Buckenmeyer et al., 2016; Kimiloglu et al., 2017; Uppal and Gulliver, 2018).

Nowadays, the growth of e-learning in the developed cultures is explosive, phenomenal and unprecedented. In the meantime, e-learning is not without challenges, problematic issues, barriers, failures, noise, risks and so forth. Realistically, e-learning can't be conceived as a flowery undertaking. Many researchers and practitioners have reported that e-learning as a future prospect medium encounters difficulties and challenges to implement successfully (Naveed et al., 2017, Retnawati et al., 2017). For example, it has been documented that in the process of learning, e-learners encounter information overload and this somewhat throttles seamless operation of learning systems (Chen et al., 2018). More, digital literacy and self-motivation impede effective implementation of the technology, particularly in the developing cultures (Mohammadyari and Singh, 2105). In addition to that many university students find it difficult to adapt to e-learning technology because the prospect of having the whole university learning experience mediated by e-device is bizarre to say the least. These and others barriers and challenges have been identified in current literature as being responsible for obstructing somewhat the success of e-learning technology.

Jordan has for long recognized the importance of pursuing an acceptable level of ICT because having this technology in place could offer a potential enabler to economic growth and development. As a result, Jordan has witnessed a huge growth and development in ICT infrastructure to drive the country up the value-added ladder and push the country into a knowledge economy. In fact, Jordan has become a regional hub in ICT infrastructure. Moreover, World Economic Forum's Global IT has reported in 2016 that Jordan ranked 60th in Networked Readiness Index (2016). This index measures the capacity of an economy to leverage ICT for enhanced growth, competitiveness and well-being. More, Jordan has in 2015 added the 4G to its wireless network infrastructure to achieve high data consumption. Technically, Jordan has established the necessary technological resources and infrastructure to launch and deliver most emerging e-based technologies with little cost. Furthermore, Jordan's Internet users reaching a phenomenal figure of about 9 million and this are nearly 86% of the total population.

The growth in e-learning has been linked with technology developments in a given context. Jordan, to some extent, is technologically literate and well-equipped for accommodating e-technologies in its industries, businesses and institutions. Still though, the massive adoption of e-learning technology in Jordan has not been realized yet to the degree and effect comparable with developed countries or some developing countries. Even though, the leadership in Jordan is aware of the benefits gained from investing in these technologies to renovate and modernize its educational infrastructure. One of the primary reasons that e-learning has not been largely embraced in Jordan is the lack of sufficient prospective studies devoted to determine what factors drive and influence user's perceptions and perspectives towards adoption of e-learning technologies.

This study emphasizes two fold objectives. First, the present study is intending to demonstrate the empirical significance of highly influential technology adoption factors in predicting the behavioral intention to adopt new technologies in developing country contexts. These factors have been identified from contemporary literature as prominently dominant in driving and drawing users' perceptions and perspectives towards adoption of new technologies. However, there has been little attention paid to study the influence of social influence (will be referred to as the concatenation effects of both subjective norm and perceived image) on behavioral intention to adopt e-learning system in Jordan. Most likely, the current analysis could be one of the rare studies set to address the influence of social influence on intention in the context of e-learning. Moreover, several studies have reported inconsistent conclusions and contradictory findings about the role of social influence in adoption studies conducted in various IS/IT domains. Furthermore, it is observed that in existing literature that little research consideration has been given to explore the effect of Internet self-efficacy on users' behavioral intention to adopt e-learning environments for the benefit of improving the quality, efficiency and effectiveness of education and learning processes. Therefore, the current study fills the knowledge void existing in extant literature by analyzing the impact of both social influence and Internet self-efficacy on behavioral intention to adopt e-learning technologies in Jordan. Finally, the inclusion of the aspect of perceived compatibility is of paramount importance because learners usually pursue educational system compatible with their lifestyles, needs and expectations. Therefore, the development and implementation of educational systems and processes that are in close compatibility with learners are crucial to make learning process rewarding and motivating. In the meantime, there has been globally little empirical research that investigates the impact of perceived compatibility on intention to adopt e-learning. Thus, the current study will add more knowledge and insights to current literature regarding the influence of perceived compatibility on intention to adopt e-learning systems.

Second, the pace at which today's technological innovation is changing, revolutionizing, reshaping, and transforming our world has been overwhelmingly incredible. This phenomenon has led to an increase in economic competition and followed by an enormous economic growth and development. One of the most qualifying aspects of this era is the rapid acceleration in how business processes are conducted that results in the compression of product life cycles. Given this state of circumstances, business practitioners are in great need to pursue ways to accelerate the technological adoption and diffusion processes. Truthfully, one of the most important issues in innovation adoption research is the investigation of the impact of culture on ICT acceptance and use. Because understanding and embracing cultural differences will be the key for businesses, organizations and industries to achieve successful and sustainable economic growth and development (Tian et al., 2018). As a result, the current study is set to investigate the moderating influence of two cultural dimensions of Hofstede's typology (individualism-collectivism and uncertainty avoidance) at individual-level on the adoption of e-learning technologies. In effect, these two particular dimensions have been recognized to be tightly connected with IT-related technology adoption behavior.

However, so far, very little attention has been paid in the current scholarly literature to explore the moderating influence of Hofstede's theory on behavioral intention to adopt e-learning digital format. In fact, to date there has been little agreement on whether cultural dimensions of Hofstede have a moderating role to play in e-learning environment. This study recognizes the scarcity of research in contemporary literature and the inadequacies of the knowledge base in such regard, therefore the current empirical analysis intends to fill the knowledge gap by investigating the moderating influence of both individualism-collectivism and uncertainty avoidance on the adoption of e-learning in a developing country context. The remainder of this paper is structured as follows: Section 2 provides the research model and hypothesis development. Section 3 presents the research methodology and analytical results. Section 4 concludes the study with discussion of empirical findings, theoretical contributions, practical implications and conclusions.

2. RESEARCH MODEL AND HYPOTHESIS DEVELOPMENT

The proposed research model for the current study is shown in Fig. 1.

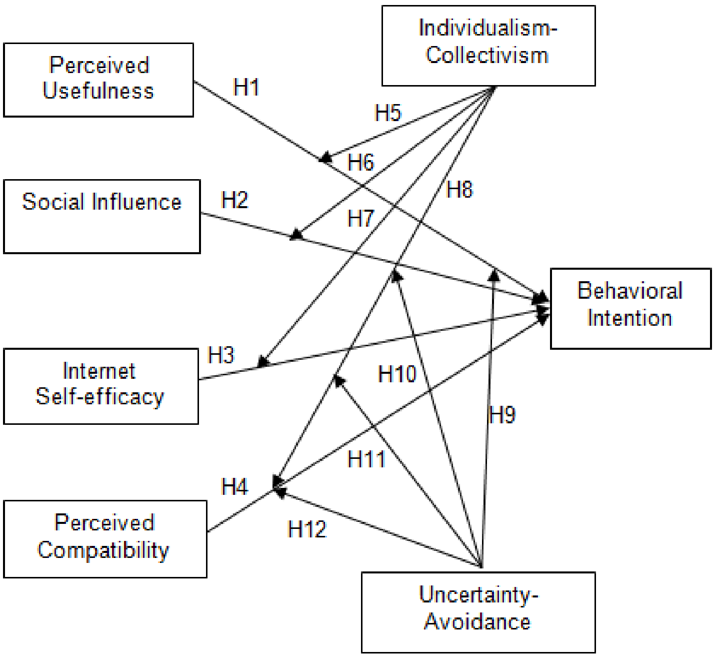

Figure 1: Research model

2.1 Perceived Usefulness

The increased demand for online-delivered technologies in order to improve individuals' and organizations' performance necessitates the understanding of what factors facilitate the acceptance and adoption of these technologies. Apparently, the Technology Acceptance Model (TAM) is one of the best suited, empirically sound, well-established and widely applied for acceptance research analysis across various IT/IS artifacts (Pavlou, 2003). The TAM model is originally based on two primary constructs: perceived ease-of-use, perceived usefulness. However, perceived usefulness has been recognized as the most significant determinant of behavioral intention to adopt and use a new technology. Definitely, any attempt to investigate the adoption of a new technology, the inclusion of perceived usefulness parameter becomes a necessity due to its dominant influence on behavioral intention. Indeed, empirical studies conducted across IT domains and across different cultural settings have concluded that the relationship between perceived usefulness and behavioral intention is most likely positively correlated. Therefore, one can conclude that perceived usefulness captures the instrumentality of IT adoption and use. In the context of e-learning system, however, perceived usefulness can be defined as using the technology will enhance educators' and learners' performance in learning and acquisition. A plethora of studies have demonstrated that perceived usefulness manifested as a dominant factor in influencing individual educators and learners to accept and use online-delivered technologies as an appropriate medium for learning and teaching system in Jordan (Almarabeh, 2014; Al-Gahtani, 2016; Faqih, 2016b). Based on the argument presented above, the following hypothesis is formed.

H1: Perceived usefulness positively influences learners' behavioral intention to adopt e-learning technology.

2.2 Social Influence

The aspect of social influence (SI) was originally introduced by the theory of planned behavior (Fishbein and Ajzen, 1975) as a prominent social force for studying the adoption of computer-based technologies. The social attributes of both subjective norm and image are the driving social forces that mostly constitute the aspect of social influence. Therefore, this study will combine the concatenation effects of both subjective norm and image attributes to represent the social influence construct. An extensive research has been carried out to understand the role of social influence when applied to different disciplines, settings and sociocultural environments in technology adoption research. Indeed, in some cases, this social dimension has figured out to be highly significant in influencing users' perceptions and behaviors towards adoption of new technologies. However, some research has challenged these findings and existing orthodoxies about this concept and offers contradictory conclusions about the impact of this social construct on various technology adoption fields. A recent comprehensive review has been carried out by Lorenz and Buhtz (2017) revealed that the social influence attribute has been subjected to a varying degree of definitions, interpretations, conceptualizations, implications, controversies, perceptions, perspectives and challenges in adoption domains of various IT/IS artifacts, products and services that have led to fragmented conclusions and outcomes. So this concept requires additional exploration to clarify its role in different domains of IT adoption research, particularly in developing countries cultures and concerning e-learning context.

E-learning is a social learning phenomenon because both educators and learners interact within complex social environment, whereby they need to converse, interact, exchange, expresses thoughts, support ideas, argue, speculate, collaborate and assess. As a result, e-learning processes are socially shaped and socially conditioned - explicitly and implicitly. Without a doubt, this implies that the social attribute of subjective norm becomes important player in the adoption process of e-learning technologies. Therefore, any attempt to gauge what factors impact individuals' perceptions and perspectives to adopt and use any innovation such as e-learning system, the subjective norm attribute must be incorporated, particularly in developing country cultures. The subjective norm refers to the social pressure exerted to engage in a particular behavior (Ajzen and Fishbein, 1980). The subjective norm generates social pressure that stimulates individuals' behavioral intentions to act positively towards the adoption of an innovation. More, many studies have documented that subjective norm exerts positive influence on users' intention to adopt e-learning platforms (e.g., Hussein, 2018).

In the context of this study, perceived image refers to the extent to which potential adopters believe that the adoption of e-learning system will enhance their image, reputation, prestige and status in their social groups (Moore and Benbasat, 1991). Several prior studies have demonstrated that one of the major motivational social forces impacting people to adopt a new technology is the desire to gain greater social status and more recognition (e.g., Solomon et al., 2013). Further, a study conducted in a developing country culture by Mohammadi (2015) has concluded that the impact of perceived image on behavioral intention was the most influential driver to adopt and use mobile-based channel for learning. Additionally, there exists no empirical research in current literature that explicitly tests the relationship between social influence (as defined in this study as being the compound effects of subjective norm and perceived image) behavioral intention to adopt e-learning system in both developed and developing cultures. Therefore, this study is intended to fill the knowledge gap in the current literature. Based on these arguments the following hypothesis will be considered important in the current study.

H2: Social influence exerts positive impact on learners' behavioral intention to adopt e-learning system.

2.3 Internet Self-efficacy

The degree of Internet knowledge sometimes refers to as the Internet self-efficacy (ISE) and technically considered as a measure of Internet literacy. The ISE is a multi-dimensional and context-dependent, and therefore it is complex and cannot be easily conceptualized in simple terms (Alqurashi, 2016). Internet self-efficacy is defined as the belief that one can successfully perform a distinct set of behaviors required to establish, maintain and utilize effectively the Internet to accomplish online tasks (Eastin and LaRose 2000).

With regard to e-learning, Internet self-efficacy can be looked at as Internet users' self-confidence in using the Internet to carry out activities associated with learning processes. Further, the entire e-learning process involves many Internet-related activities and tasks and therefore both educators and learners must be knowledgeable and experienced in using the Internet and its associated tools, applications and services.

The growing prominence and influence of the Internet as a delivery channel for information, services, communication, transactions and high-volume content as well as the dynamic and changing technological nature of the Internet environment pose a multiplicity of meticulous challenges requiring its users to continue being competent, skillful and knowledgeable. With the continuous introduction of new and advanced Internet-related tools and applications, the degree of expertise of Internet self-efficacy demands from users a continual development and improvements in all Internet-related capacities and competencies so that individuals would remain confident, skillful, knowledge-updated, innovative and productive when working and interacting with e-based technologies such as e-learning platforms.

A plethora of researchers have acknowledged that the Internet self-efficacy plays an important role in shaping one's perceptions and perspectives towards technology adoption of online-based technologies (Faqih, 2013; Jaradat and Faqih, 2014; Ahmad, 2019). For example, an empirical analysis was conducted by (Tsai et al., 2011) to determine the role of Internet self-efficacy in online-based learning platforms. Tsai et al. (2011) concluded that those who exhibit higher level of competency in Internet self-efficacy have delivered greater level of performance in implementing e-learning technologies. In addition, an empirical analysis examining the influence of Internet self-efficacy on nurses while interacting with online-learning environment (Liang et al., 2011) has confirmed that nurses' Internet self-efficacy positively impacted their attitudes towards continuing usage of e-learning platform. However, far too little attention has been paid to investigate the influence of Internet self-efficacy on individual's behavioral intention to adopt e-learning environments for education and learning. Based on the above argument, the following hypothesis will be formed.

H3: There is a positive relationship connecting the aspect of Internet self-efficacy with learners' behavioral intention to adopt e-learning system.

2.4 Perceived Compatibility

One primary objective of this study is the intent to explore the importance of perceived compatibility (drawn from Innovation Diffusion Theory IDT) attribute in studying the adoption of e-learning system. The IDT is based on five parameters that characterize the adoption of a new innovation. Of which, the element of perceived compatibility that has been cited as a strong predictor of behavioral intention towards the adoption of a new innovation. Perceived compatibility is defined as the extent to which an e-learning technology recognized as being consistent with the existing values, lifestyles and needs of learners and educators (Moore and Benbasat, 1991). This implies that if the technology is compatible and aligned with individuals' values and lifestyles he or she will be more motivated to adopt the technology. Among all online-delivered technologies, e-learning has some unique peculiarity in the sense that it has a type of compatibility that fits perfectly with learners' needs, lifestyles and expectations. As a result, this study acknowledges the prominent role plays by perceived compatibility in e-learning adoption and acceptance research. Learners normally pursue educational system compatible with their lifestyles and needs because learning is a lengthy process that takes up a lot of learners' time and resources. As a result, developing close relation between learners and learning processes are imperative to provide the level of compatibility required to make learning process comfortable, motivating, enjoyable, fulfilling and progressive. In fact, the present work believes that the dynamics of e-learning technology and the aspect of perceived compatibility have unique and special relationships because within e-learning context educators and learners decide the time, location and tempo of learning processes.

The evidence from existing literature suggests that perceived compatibility plays a critical and influential role on the adoption process of e-learning. In addition, the current empirical study strongly anticipates that greater level of perceived compatibility leads to the development of a greater behavioral intention in adoption of e-learning technology. For example, an empirical investigation carried out by Duan et al., (2010), who adopted the Innovation Diffusion Theory and tested all its five antecedents to study the adoption of e-learning technology in China. They concluded that perceived compatibility is the only antecedent that has a significant positive correlation with behavioral intention to adopt e-learning system. Further, a study implemented by Lee et al. (2011) concluded that perceived compatibility was a potential determinant of intention to adopt e-learning technology. Consequently, based on the discussions and findings above, the following hypothesis will be proposed:

H4: There is a positive relationship linking perceived compatibility with learners' behavioral intention to adopt e-learning system.

2.5 Culture and Technology Adoption

Culture is notoriously one of the most complex and intriguing concept to conceptualize and define. Over the years, the definition of culture has been a subject of academic controversy. As a result, many definitions and frameworks have been developed to understand and measure how culture influences humans' behaviors, particularly in relation to technology adoption and diffusion. Hofstede (1980) defines culture as the collective programming of the human mind that distinguishes one group or category of people from another. However, the definition proposed by Hofstede (1980) is probably the most frequently used. Moreover, Hofstede's cultural dimensions theory has been widely recognized and accepted in recent decades. Among all theoretical frameworks proposed in literature to address aspects of culture, the Hofstede's typology has been well-recognized, endorsed, widely embraced, fundamentally validated, praised for its empirical basis by researchers and practitioners and adequately appropriate for use in information technology adoption research. The original Hofstede's framework consists of four main dimensions: individualism-collectivism, uncertainty avoidance, power distance and masculinity-femininity. All of these dimensions have been majorly linked to adoption of a new technology. However, both individualism-collectivism and uncertainty avoidance dimensions have been found to be more influential and more impactful in IT adoption studies than the other two cultural dimensions.

Indeed, Hofstede's theory has been applied in different consumer marketing contexts and in different IT/IS domains. Indeed, it has been observed that there exists significant variations in individual-level cultural values within the overall national level (McCoy et al., 2005; Fang, 2012; Faqih and Jaradat, 2015; Tarhini et al., 2017). Therefore, investigating these variations in individual-level cultural orientations could have an important impact on users' perceptions towards the adoption of a new innovation. In the meantime, many have advocated this type of empirical analysis as being the better option for analyzing individuals' behavior in relation to technology adoption (Srite and Karahanna, 2006; Fang, 2012). However, much controversy has been evoked to what degree Hofstede's measures can be safely applied for individual-level cultural analysis since they were originally developed for use at national-level analysis. A plethora of recent analytical studies have provided adequate empirical support to the validity and reliability of Hofstede's measures to be used for individual-level analysis (McCoy et al., 2005; Srite and Karahanna, 2006; Faqih and Jaradat, 2015; Tarhini et al., 2017). In fact, one of the most interesting issues in technology adoption is the inclusion of the aspects of culture in the adoption research. However, there has been little research that has been performed to test empirically how culture influences the adoption of e-learning process, especially as a moderating role. Definitely, this study intends to fill this knowledge gap in the current literature. To achieve the objectives of this study, this empirical analysis intends to investigate the moderating effects of individualism-collectivism and uncertainty avoidance on individuals' behavior towards adoption of e-learning technologies.

2.5.1 Individualism-Collectivism

Individualism-collectivism (IC) refers to the extent to which individual self-interest is prioritized over the concerns of the group (McCoy et al., 2005). Individualistic cultures are more self-centered and emphasize mostly on their individual goals and perceive personal identity as dominant. Collectivistic cultures have a great emphasis on groups and it views the group as the primary entity. In Hofstede's (1991) classification, Arab culture was rated to have a more collective than individualistic culture. The IC cultural values will be explored further in the context of e-learning field because IC has intrinsic characteristics that is closely and behaviorally linked to the dynamics of human social behavioral patterns and attributes. Drawing on empirical evidence, the aspect of IC has been attributed to have a powerful impact on individuals' reasoning, behaviors, perceptions as well as decision-making processes (Yates and de Oliveira, 2016; De Mooij et al., 2019). Moreover, the IC is probably the most significant marker determining whether a human will be willing to make a decision to uptake a new technology. Myriad of empirical analysis have investigated the role played by IC on the adoption of various IT/IS products and services (Tam et al., 2017; Teo and Huang, 2019).Yet still, little attention has been directed to explore the possible moderating effects of IC at individual level on the adoption of IT artifacts (Srite and Karahanna, 2006; Faqih and Jaradat, 2015; Akhtar et al., 2019). For example, one of the earliest empirical studies was conducted by Srite and Karahanna (2006) reported that there was a significant moderating effects of IC on the adoption process of the technology. Recently, Faqih and Jaradat (2015) implemented the TAM3 model and demonstrated that the IC has an important moderating influence on the adoption of m-commerce in Jordan.

Despite the extensive research conducted on the relationship between information technology and culture, far too little attention has been focused and insufficient empirical data available to provide conclusive evidence on the moderating influence of IC on the adoption process of e-learning technology. In effect, there has not been much empirical evidence in literature addressing the possible moderating role played by IC on the adoption of e-learning technology. For example, Tarhini et al. (2017) applied an extended TAM model to examine the moderating effects of the primary Hofstede's cultural dimensions on the adoption of e-learning. Tarhini et al. 's study was performed in a developing country context of Lebanon and revealed that there was some moderating effects of these cultural dimensions on the adoption and use of e-learning technologies.

With regard to the moderating effect of IC at individual-level on the relationship between the powerful TAM's construct of perceived usefulness and behavioral intention, the existence evidence regarding this relationship is inconsistent and inconclusive (Faqih and Jaradat, 2015; Tarhini et al., 2017). In contemporary literature, it is widely observed that individualist cultures tend to embrace perceived usefulness as an instrumental predictor of adoption intention. For instance, one of the earliest cross-culture empirical studies was conducted in an educational setting by Sanchez-Franco et al. (2009), they examined the moderating influence of IC on TAM's model primary relationships. Their results highlighted that perceived usefulness is more influential on behavioral intention to use e-learning technology for individualistic users than for collectivist users. In fact, collectivists tend to perceive social influence as more instrumental factor in predicting behavioral intention than individualists (McCoy et al., 2005; Srite and Karahanna, 2006). For example, Tarhini et al. (2017) explored the moderating influence of Hofstede's cultural values at individual-level in a developing country context. Their results have underlined that IC positively moderates the relationship between social influence and intention to adopt and use e-learning. This result points to the fact that users from collectivistic background have the tendency to be driven by social influence to perceive higher behavioral intention towards adoption of a new technology.

Recent empirical investigations have examined the influence of Internet self-efficacy on behavioral intention to adopt and use a new technology. However, as far as I am aware there has been little attention has been focused on how IC moderates the relationship between Internet self-efficacy and behavioral intention. Definitely, this type of analysis is missing from contemporary literature. Probably, this is the first study to analyze empirically the moderating impact IC on the relationship connecting Internet self-efficacy with behavioral intention to adopt e-learning technologies. Without a doubt, the outcomes of this type of empirical analysis will fill the theoretical knowledge gap existing in the field of technology adoption research. This study will be consistent with typical conventions which is the higher the degree of collectivism the weaker the relationship between Internet self-efficacy and behavioral intention to adopt e-learning technologies. Little research has been carried out to examine the moderating influence of IC on the relationship between perceived compatibility and intention to adopt a new technology. One of the rare studies that have tackled this specific issue was conducted by Rufín et al. (2014), they investigated the cultural differences between two countries of relatively diverse cultural contexts and practices (USA and Spain) in the process of e-government adoption. Their conclusions have documented that the correlation between compatibility and intention had stronger effects on individualistic individuals (USA) than on collectivistic individuals (Spain). Therefore, the current empirical analysis will follow the same conclusions of Rufín et al.'s study. Finally, based on the arguments above, the following hypotheses will be proposed.

H5: The higher the level of Individualism-collectivism, the weaker the impact of perceived usefulness on behavioral intention to adopt e-learning technology.

H6: The higher the level of Individualism-collectivism, the stronger the impact of social influence on behavioral intention to adopt e-learning technology.

H7: The higher the level of Individualism-collectivism, the weaker the impact of Internet self-efficacy on behavioral intention to adopt e-learning technology.

H8: The higher the level of Individualism-collectivism, the weaker the impact of perceived compatibility on behavioral intention to adopt e-learning technology.

2.5.2 Uncertainty Avoidance

Uncertainty avoidance (UA) is defined as the degree to which people in a culture feel uncomfortable with uncertainty and ambiguity (Hofstede, 1980). In search for stability, people who are characterized by high UA tend to prefer to work and be associated with environments controlled by rules and regulations. On the other end of the continuum, people who are characterized by low uncertainty avoidance tend to be less rule- and regulations-oriented. Certainly, the UA has been observed by researchers to have strong effects on individuals' behavior and decision making process, and particularly the decision to adopt a new technology. For instant, in high uncertainty avoidance cultural perspective, people are inclined to have low level of acceptance and tolerance and more stressed for ambiguous circumstances and situations. Consequently, high state of uncertainty and ambiguity may normally lead to people becoming apprehensive and less motivated when encountering new challenges such as the adoption of new technologies (Zakour, 2004). On the other hand, cultures characterized with low level of UA tend to be innovative, flexible, adaptive to change, comfortable with unstructured environments, open to new ideas, tolerant of uncertainty, informative in interaction, accept new influences and able to adapt to new technologies (Zakour, 2004; Hofstede, 2001; Dinev et al., 2009). In fact, it has been observed that individuals belonging to high uncertainty cultures are less enthusiastic to use a new technology, unlike those of low uncertainty avoidance cultures who are inclined to accept the use of a new technology.

Historically, the Arab culture has been recognized as having the perspective of high uncertainty avoidance characteristics (Hofstede, 1980). The birth of the unstoppable and irreversible digital transformation phenomenon has truly caused variations in how the Arab citizens perceive uncertainty avoidance cultural values. Therefore, there have been real observations that point to cultural differences at individual-level among the Arabs because it is a common convention that digital transformation impacts individual culture and vice versa (Vey et al., 2017). In effect, uncertainty avoidance has been considered as one of the primary drivers responsible for influencing individuals' behavior towards adoption of a new innovation (Srite and Karahanna, 2006; Tarhini et al., 2017). However, despite the huge amount of empirical literature that has been conducted to address how elements of culture influence the adoption processes of information technology, little attention has been paid to investigate the moderating impact of uncertainty avoidance on these processes.

The role of uncertainty avoidance in moderating TAM-based primary relationships has been examined (Tarhini et al., 2017). With regard to the moderating impact of uncertainty avoidance on the relationship between perceived usefulness and intention, studies have documented inconsistent findings and outcomes. However, there is a popular perception that low uncertainty avoidance cultures tends to embrace perceived usefulness more than high uncertainty avoidance cultures. For example, a number of studies have verified that individuals with low high uncertainty tend to reveal strong orientation towards the relationship between perceived usefulness and intention while the counterpart tend to exhibit weaker orientation (Choi and Geistfeld, 2004; Belkhamza and Wafa, 2014). Quite unexpectedly, an empirical study conducted in a collectivistic cultural context set to explore the moderating influence of cultural dimensions of Hofstede's typology on the adoption process of e-learning technologies (Tarhini et al., 2017), they concluded that the higher the level of uncertainty avoidance the greater the influence of perceived usefulness on intention to adopt e-learning. In the meantime, an empirical study was carried out to investigate the moderating influence of cultural dimensions on the adoption of e-learning format (Sanchez-Franco et al., 2009), they confirmed that individuals with low uncertainty avoidance have more effects on the relationship linking perceived usefulness with behavioral intention than individuals with high uncertainty avoidance. Therefore, it is apparent that individuals with low uncertainty avoidance are likely to embrace perceived usefulness more than individuals with high uncertainty avoidance.

Empirical studies have established that people with high uncertainty avoidance are more influenced by social influence. Therefore, it is expected that the aspect of uncertainty avoidance moderates positively the relationship between social influence and intention to adopt a new technology. Indeed, it is a common convection that the aspect of social influence has greater influence on behavioral intention for individuals with high uncertainty avoidance to adopt a new technology (Srite and Karahanna, 2006; Dinev et al., 2009). A study conducted on e-learning has confirmed that uncertainty avoidance moderates positively the relationship between social influence and behavioral intention (Tarhini et al., 2017). With regard to the role plays by uncertainty avoidance in moderating the relationship between Internet self-efficacy and behavioral intention, there has been very little attention paid in literature to investigate this particular relationship. As far as we are aware, there are not many IT-related studies that have been carried out to explore the moderating impact of uncertainty avoidance on the relationship between Internet self-efficacy and intention. Nevertheless, it is a common theme that low uncertainty avoidance cultures are more concerned with Internet self-efficacy in such a way that if they feel that they are comfortable using the Internet for executing certain tasks they will develop high level of intention towards the adoption of the technology. Finally, the moderating impact of uncertainty avoidance on the relationship between perceived compatibility and intention has not been widely investigated. In fact, little research consideration has been paid to study the moderating influence of uncertainty avoidance on such relationship. One of the rare studies that was conducted to explore the adoption of e-government service in Malaysia by Reddick (2010). It is interesting to acknowledge that the study conducted in Malaysia established that the influence of uncertainty avoidance on the relationship connecting perceived compatibility with behavioral intention was weaker among Malaysians who have a high level of uncertainty avoidance characteristics (Reddick, 2010). In consequence, individuals with low UA tend to embrace perceived compatibility more than their counterpart, and so it is expected that low UA cultures exhibit greater behavioral intention towards the adoption of information technologies if they find such technology is compatible with their needs and expectations. Based on the arguments presented above, the following hypotheses will be proposed:

H9: The higher the level of uncertainty avoidance, the weaker the impact of perceived usefulness on behavioral intention to adopt e-learning technology.

H10: The higher the level of uncertainty avoidance, the stronger the impact of social influence on behavioral intention to adopt e-learning technology.

H11: The higher the level of uncertainty avoidance, the weaker the impact of Internet self-efficacy on behavioral intention to adopt e-learning technology.

H12: The higher the level of uncertainty avoidance, the weaker the impact of perceived compatibility on behavioral intention to adopt e-learning technology.

3. RESEARCH METHODOLOGY

The primary objectives of this study are to investigate first, the influence of technology adoption factors (perceived usefulness, social influence, Internet self-efficacy, perceived compatibility) on behavioral intention to adopt e-learning technology. These factors have been established to be significantly prominent in augmenting the intention to adopt varying e-delivered information technologies. Second, the moderating impact of cultural values (individualism-collectivism and uncertainty avoidance) at individual-level on the relationships connecting these factors with the intention to adopt e-learning. To achieve the objectives of this study, the study is pursuing a quantitative-based approach that manifests itself uniquely with the way relevant data are collected and statistically analyzed. A questionnaire was developed in English and translated into the Arabic language with the full intention to convey both explicit and implicit meanings. Panels of experts have examined the validity of the translated questionnaire. The measurement scales utilized in the study were adapted from previous validated scales. It is commonly agreeable practice to use Likert scale instrument in the survey questionnaire (Tigre & Dedrick, 2004). Seven point measurement scales are used with 1 as “strongly disagree” and 7 as “strongly agree”.

A paper-based self-administered questionnaire was used to gather relevant data to arrive at the primary intentions of this study. Then data was collected from undergraduate students in governmental university in Jordan. A total of 262 valid questionnaires have been utilized in the current analysis. To analyze the data collected, the study used the WarpPLS 5.0 software. This statistical software has been widely utilized and accepted in IS/IT domains for many reasons: first, this variance-based software is statistically appropriate for capturing linear and non-linear relationships simultaneously, the non-linearity is usually encountered in data collected for behavioral research (Kock, 2012). Second, it handles complex systems, especially systems with moderating effects. In addition, PLS-based SEM software has gained a wide popularity in recent years among researchers and practitioners alike, especially studies related to IS/IT and marketing research.

3.1 Evaluating the Measurement Model

The PLS software is highly versatile as it has the necessary mathematical tools and resources to confirm the adequacy of the model’s fitness to determine that sample data are normal in order to carry the data for further analysis. The WarpPLS version 5.0 used to evaluate the adequacy of the measurement model through validation of constructs’ reliability and validity. Construct reliability measures the degree to which items are free from error and therefore yield consistent results. Internal consistency reliability is normally tested using Cronbach’s alpha coefficients. The alpha coefficient measures the extent to which the multiple indicators for a construct belong together. Cronbach’s alpha scores have been calculated in the current study and found to range between 0.738 and 0.896 (see Table 1). The Cronbach alpha for each construct is exceeding the 0.70 benchmark recommended by Hair et al. (2011), suggested adequate internal reliability. The construct validity process has traditionally been introduced to provide experimental evidence that an instrument measures the construct it is theoretically supposed to measure. Construct validity, since its inception some five decades ago as a statistical concept, has been embraced by practitioners, researchers, academics and other experts. However, there are multiple ways to measure this concept. In effect, construct validity has been recognized to be the most complicated concept to establish. The mainstream of practitioners and researchers attempt to assess construct validity through providing an evaluation of both convergent validity and discriminant validity, the two measurements are assumed to be acceptable to demonstrate that the measurement instrument is adequately valid if they meet the theoretical requirement established for such purpose.

Convergent validity measures the degree to which the measurement items actually represent the construct. Convergent validity is assessed by examining each measurement item whether correlates strongly with its intended hypothetical construct (Straub et al., 2004). This implies that the measurement items must have more correlation with the construct they theoretically supposed to measure than the correlation with the rest of constructs included in the research model. As suggested by Hair et al. (2010), the convergent validity test is accomplished through the assessment of three criteria: the factor loadings (FL), composite reliability (CR) and the average variance explained (AVE). From Table 1, it is evident that all measurement items have a loading well above the recommended value of 0.50 (Hair et al., 2010), and therefore authenticating the validity of survey measures. The composite reliability measure which assesses the extent to which measurement items in the construct measures the latent construct (Hair et al., 2010). Composite reliability values calculated in the present study (see Table 1) are greater than 0.7, ranging from 0.836 to 0.924. However, an acceptable threshold value for composite reliability coefficient is 0.70. The average variance extracted (AVE) represents the overall amount of variance in the indicators accounted for by the latent construct. The current study calculates the average variance extracted (AVE) for each construct and found to be above the recommended value of 0.50 (see Table 1). The proposed model reports that factor loadings, composite reliabilities values and average variance extracted are well above the recommended threshold values. Hence, there is an adequate verification that reveals the existence of convergent validity in the proposed model.

Table 1. Reliability and Validity

Constructs	Item Code	Factor Loading	Cronbach's Alpha	Average Variance Extracted (AVE)	Composite Reliability
Behavioral Intention (BI)	BI1	0.774	0.853	0.629	0.895
	BI2	0.807			
	BI3	0.782			
	BI4	0.798			
	BI5	0.805			
Perceived Usefulness (PU)	PU1	0.829	0.866	0.714	0.909
	PU2	0.886			
	PU3	0.833			
	PU4	0.832			
Social Influence (SI)	SI1	0.687	0.738	0.562	0.836
	SI2	0.699			
	IM1	0.824			
	IM2	0.780			
Internet Self-efficacy	ISE1	0.785	0.770	0.592	0.853
	ISE2	0.778			
	ISE3	0.754			
	ISE4	0.76			
Perceived Compatibility (PC)	PC1	0.876	0.861	0.707	0.906
	PC2	0.859			
	PC3	0.846			
	PC4	0.777			
Individualism-Collectivism (IC)	IC1	0.778	0.870	0.658	0.924
	IC2	0.836			
	IC3	0.850			
	IC4	0.814			
	IC5	0.774			
Uncertainty Avoidance (UA)	UA1	0.866	0.896	0.708	0.906
	UA2	0.858			
	UA3	0.875			
	UA4	0.795			
	UA5	0.809			

Furthermore, there is a need to carry out the discriminant validity test at both the item level as well as at the construct level to ensure the construct validity of the scales. Chin (1998) suggested that the discriminant validity at the item level can be found based on the concept of cross-loading of indicators, or in other words as recommended by Chin (1998) that a construct should share more variance with its measures than it shares with other constructs in the model. Table 2 clearly shows that these statistical requirements are adequately met, while an assessment of indicator cross-loadings shows that all measurements items are loading more strongly with their respective construct than other constructs in the model (Chin, 1998; Hair et al., 2010). These findings strongly confirm that indicator discriminant validity is sufficient at the item level. Further, with regard to the discriminant validity assessment, Fornell and Larcker (1981) suggested an efficient and acceptable measure to estimate discriminant validity at the construct level. Therefore, the present study examined the construct discriminant validity by means of Fornell and Larcker (1981) criterion, it is calculated by comparing the square root of average variance extracted with the correlation of that construct with the rest of the constructs. It is manifested from Table 3 that the diagonal elements are larger than off-diagonal elements. These findings are indicative of the fact that constructs in the proposed model have acceptable discriminant validity. Consequently, the obtained outcomes in this study manifestly demonstrate that the research model exhibits sufficient reliability and construct validity.

Table 2. Loadings and Cross-Loadings for the Measurement Model

	BI	PU	SI	ISE	PC	IC	UA
BI1	**0.774**	0.072	-0.036	-0.024	0.053	-0.103	0.148
BI2	**0.807**	-0.027	0.078	-0.064	0.103	0.003	0.031
BI3	**0.782**	-0.044	-0.044	-0.054	-0.079	0.090	-0.017
BI4	**0.798**	-0.018	0.159	0.073	-0.054	-0.066	-0.084
BI5	**0.805**	0.018	-0.16	0.069	-0.024	0.074	-0.074
PU1	-0.061	**0.829**	0.032	-0.041	-0.048	0.028	0.014
PU2	-0.064	**0.886**	-0.029	0.005	-0.078	-0.059	0.153
PU3	-0.004	**0.833**	0.015	0.169	0.111	0.073	-0.228
PU4	0.133	**0.832**	-0.015	-0.134	0.020	-0.037	0.051
SI1	0.110	-0.04	**0.687**	-0.152	-0.126	0.000	0.315
SI2	0.074	0.068	**0.699**	0.01	-0.066	-0.153	0.158
IM1	-0.197	0.058	**0.824**	0.084	0.105	0.056	-0.202
IM2	0.045	-0.086	**0.780**	0.036	0.059	0.078	-0.207
ISE1	-0.005	-0.064	0.123	**0.785**	0.000	-0.168	0.107
ISE2	-0.078	-0.114	0.110	**0.778**	0.053	-0.195	0.101
ISE3	-0.105	0.113	-0.042	**0.754**	-0.082	0.211	-0.028
ISE4	0.188	0.072	-0.198	**0.760**	0.027	0.164	-0.186
PC1	-0.018	-0.059	0.034	0.034	**0.876**	0.021	0.051
PC2	-0.007	-0.062	0.020	0.020	**0.859**	-0.186	0.152
PC3	0.139	0.097	0.026	0.026	**0.846**	0.067	-0.063
PC4	-0.124	0.030	-0.089	-0.089	**0.777**	0.109	-0.157
IC1	0.069	-0.099	-0.220	-0.220	0.073	**0.778**	0.038
IC2	0.049	0.001	-0.023	-0.023	0.015	**0.836**	0.023
IC3	-0.076	0.037	0.045	0.045	-0.001	**0.850**	-0.017
IC4	0.029	-0.008	0.167	0.167	-0.039	**0.814**	-0.153
IC5	-0.069	0.066	0.020	0.020	-0.047	**0.774**	0.116
UA1	-0.039	-0.007	-0.123	-0.123	0.214	-0.094	**0.866**
UA2	0.145	-0.041	-0.096	-0.096	0.033	-0.033	**0.858**
UA3	-0.077	0.129	0.055	0.055	-0.043	-0.045	**0.875**
UA4	-0.034	0.040	0.117	0.117	-0.258	0.060	**0.795**
UA5	0.004	-0.128	0.059	0.059	0.036	0.124	**0.809**

Table 3. Discriminant Validity of Constructs

	BI	PU	SI	ISE	PC	IC	UA
BI	**0.793**						
PU	0.551	**0.845**					
SI	0.561	0.465	**0.750**				
ISE	0.368	0.296	0.386	**0.769**			
PC	0.438	0.397	0.496	0.288	**0.841**		
IC	0.383	0.313	0.446	0.371	0.575	**0.811**	
UA	0.468	0.369	0.480	0.380	0.647	0.638	**0.841**

Note: Diagonal elements (in bold) are the square root of average variance extracted (AVE). Off-diagonal elements are the correlations among constructs.

4.2 Evaluating the Structural Model

In the previous section the research model was statistically assessed using the WarpPLS 5.0 in terms of reliability and validity for both items and constructs. The results obtained through WarpPLS 5.0 confirmed that the proposed model is statistically set for more analysis such as hypothesis testing. The WarpPLS 5.0 is equipped with a set of model fit indices. Firstly, the quality of the model is usually assessed by examining two model fit related indices, these indices investigate model fit criterion: the average path coefficient (APC=0.182, P<0.001), and the average block variance inflation factor (AVIF= 4.324, acceptable if <= 5, ideally <= 3.3). These results evidently show that there is a good fit between the proposed model and the sample data. Secondly, the global validity of the model is an important criterion to be established before empirical data is considered for testing the proposed hypotheses. Tenenhaus et al. (2005) has developed a statistical methodology to assess the global validity of the model. Tenenhaus et al. (2005) provided a mathematical means by assessing what is called the goodness-of-fit (GoF) criteria. The WarpPLS 5.0 offers an estimate for GoF(=0.611) for the present model, this is greater than the acceptable threshold value of GoF >=0.36, suggested for large R^2 (refers to as the coefficient of determination that indicates in % the extent with which the independent variables explain the variation in the dependent variable). As a result, the global validity of the model is adequate. Thus, given the findings above the research model can be carried forward for additional analysis such as hypothesis testing.

The WarpPLS 5.0 to examine the hypotheses proposed in the model. This study involved 12 hypotheses, of which 8 hypotheses involving moderating effects. The findings in this study have confirmed that 10 hypotheses have a statistical significance. The current study has verified that perceived usefulness, social influence, Internet self-efficacy and perceived compatibility have positive influence on intention to adopt e-learning. Further, both individualism-collectivism and uncertainty avoidance have been found to have a moderating effects on all the hypothesized relationships with exception of the relationship connecting perceived usefulness with behavioral intention as neither individualism-collectivism nor uncertainty avoidance was found to exert any moderating impact on this relationship (see Figure 2).

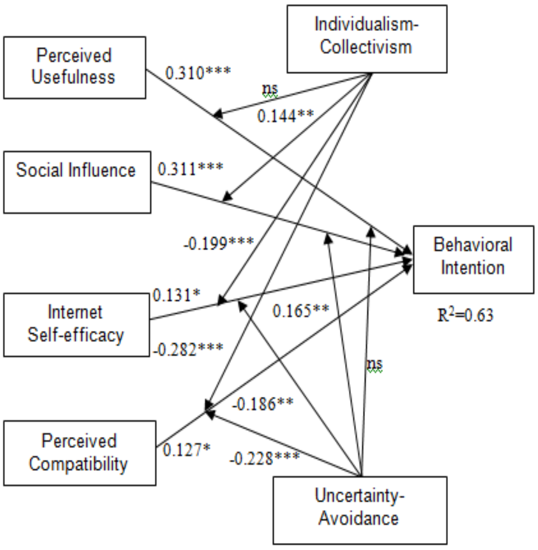

Figure 2: Hypothesis testing results. *p<0.05, **p<0.01, ***p<0.001, ns=not supported.

5. DISCUSSION AND CONCLUSIONS

The current study has suggested a model to investigate the effect of four prominent factors on behavioral intention to adopt e-learning technology in a developing country context. These factors have been established in prior literature to be accountable for enhancing individuals' behavioral intention. This study has also included as moderators two cultural dimensions that have been found to be linked to studies examining technology adoption behaviors.

5.1 Discussion of Findings

The propagation and proliferation of the Internet-delivered technologies have dramatically inspired global research aimed at advancing our knowledge of the dynamics of these technologies in varying environmental settings. The current study is set to investigate the influence of factors that drive behavioral intention to adopt e-learning systems namely: perceived usefulness, social influence, Internet self-efficacy and perceived compatibility. In addition, this study examines the moderating influence of individualism-collectivism and uncertainty avoidance on the hypothesized relationships identified as important in the adoption of e-learning environment. The proposed model identifies 12 hypotheses which were statistically analyzed using WarpPLS 5.0. The empirical conclusions of this study provide vital contributions and interesting insights. Unfortunately, there has been a scarcity of similar research with regard to some of the hypotheses in order to be able to make the appropriate comparisons with the findings reported in the present study.

The results reported by the current study have demonstrated that perceived usefulness positively influences behavioral intention to adopt e-learning technologies (**H1**: β=0.310, p<0.001). This implies that if the perceptions of usefulness have been amplified the intention to adopt the technology will be enhanced and so this will lead to improvement in the adoption rate of the e-learning technology. The current findings are consistent with previous researches conducted at developing country contexts (Almarabeh, 2014; Al-Gahtani, 2016; Faqih, 2016b). These findings inform that both learners and educators will intend to adopt e-learning technologies if they find it useful and the adopted technologies practically provide the tangible benefits users demand. In addition, this study has determined that the aspect of social influence has a significant positive impact on behavioral intention to adopt e-leaning systems (**H2**: β=0.311, p<0.001). In fact, according to the context of the present study, the concatenation effects of both subjective norm and image determinants combined to represent the aspect of social influence. However, social influence as it is defined in this study has never been tested with respect to the adoption of e-learning system. However, subjective norm has been confirmed to influence positively the behavioral intention to adopt and use e-learning environments (Cheung and Vogel, 2013; Hussein, 2018). More, as reported by Mohammadi (2015), image attribute has been observed also to have positive influence on the intention to adopt mobile-based learning technologies. Therefore, the greater the level of social influence the higher the intention. Consequently, this work has concluded that social influence, which includes the concatenated effects of both subjective norm and perceived image, has a role to play in enhancing intention to adopt e-learning technologies.

Furthermore, the conclusion of this study has empirically demonstrated that the Internet self-efficacy has a positive influence on the intention to adopt e-learning systems (**H3**: β=0.131, p<0.05). In the context of this study, the higher the level of the Internet self-efficacy the greater the behavioral intention to adopt e-learning system. Evidently, many empirical studies were conducted to investigate the influence of self-efficacy on the adoption process of e-learning technology. The findings concluded by these studies have documented the influence of Internet self-efficacy in such domain, particularly with respect to users' satisfaction, attitude and continuing usage of e-learning system (Hussein et al., 2007; Wu et al., 2010; Liang et al., 2011). In essence, this particular type of hypothesis (H3) has not been investigated before in connection with e-learning systems, therefore any comparison between the current and previous findings would be difficult to make. Indeed, this particular finding is missing from literature. Finally, the present study has confirmed the direct influence of perceived compatibility on the behavioral intention to adopt e-learning technology in Jordan (**H4**: β=0.127, p<0.05). The present finding is in-line with the conclusion reported by Lee et al. (2011). Apparently, if learners and educators feel that the technology is compatible with their values, beliefs and preferences they will be highly motivated and less resistant to adopt the technology. So enhancements of the perceptions of compatibility attribute will lead to acceleration in the adoption of online-based technology for learning and education.

The present study has revealed the importance of individualism-collectivism in moderating three of the four proposed relationships. The individualism-collectivism cultural values has been found to have no moderating effects on the relationship between perceived usefulness and behavioral intention to adopt e-learning process (**H5**: β=-0.035, p=2.82). This implies that any variation in the aspect of individualism-collectivism will not strengthen or weaken the relationship between perceived usefulness and users' behavioral intention towards e-learning adoption. It is commonly acknowledged that individualistic cultures to tend embrace the perceptions of usefulness more that collectivistic cultures to adopt e-learning technologies (Sanchez-Franco et al., 2009). However, previous reported findings evidently confirmed that there is inconsistent outcomes with regard to moderating influence of IC on the relationship between perceived usefulness and the intention to adopt a technology (Faqih and Jaradat, 2015; Tarhini et al., 2017). Additionally, the current results strongly demonstrate that the individualism-collectivism moderates positively the relationship between social influence and behavioral intention (**H6**: β=0.144, p<0.01). Therefore, the greater the IC cultural values the more impact social influence will have on behavioral intention to adopt online learning. In other words, with increasing the aspect of individualism, social influence attribute becomes less influential in intensifying individual's behavioral intention towards the adoption process of e-learning. The result of the present study is in harmony with previous study conducted by Tarhini et al. (2017) in a collectivist culture, they reported the same finding.

The findings of this study confirmed that individualism-collectivism negatively moderates the relationship between Internet self-efficacy and behavioral intention (**H7**: β=-0.199, p<0.001). This indicates that the higher level of individualism-collectivism, the weaker the influence of Internet self-efficacy on behavioral intention to adopt e-learning technology. This result points to the fact that individualistic cultures tend to develop greater behavioral intention towards adoption of a technology when feeling comfortable utilizing the

Internet related technologies, tasks and applications. Indeed, the current findings are consistent with hypothesized relationship (H7). However, lack of comparable studies in similar contexts will make it difficult to provide any comparison between current results and previous ones. Finally, the moderating impact of IC on the relationship between perceived compatibility and behavioral intention has been found to be highly significant and negative (**H8**: $\beta=-0.282$, $p<0.001$). This implies the higher the IC cultural values the lesser the influence of perceived compatibility on behavioral intention to adopt e-learning technologies. This result conforms with what has been hypothesized in the current analysis. Further, the present findings support the popular concept that individuals belonging to developed countries cultures embrace perceived compatibility in greater proportionality than individuals belonging to developing countries cultures.

This study proposed four hypotheses, whereby uncertainty avoidance has been tested as a moderator between the relationship linking perceived usefulness, social influence, Internet self-efficacy and perceived compatibility with behavioral intention to adopt e-learning system in a developing country context of Jordan (**H9**, **H10**, **H11**, **H12**). Only one of these hypotheses (**H9**: $\beta=-0.065$, $p=0.143$) was not statistically supported that links perceived usefulness with behavioral intention, this particular finding does not agree with contemporary literature. Apparently, these variations and inconsistencies in findings reported by different studies merit further exploration to establish more profound critical understanding of the exact moderating role the cultural aspect of uncertainty avoidance plays in the relationship connecting perceived usefulness with behavioral intention. More, this study reveals that the uncertainty avoidance moderates positively relationship linking social influence with behavioral intention (**H10**: $\beta=0.165$, $p<0.01$) to adopt e-learning and this finding agrees with what contemporary literature has already verified (Srite and Karahanna, 2006; Dinev et al., 2009; Tarhini et al., 2017). The outcome of this study determines that social influence can be a motivating force to accelerate the pace of adoption and diffusion of e-learning technologies among people with high aspect of uncertainty avoidance cultural values.

Concerning the impact of uncertainty avoidance on the relationship between Internet self-efficacy and behavioral intention, this study has shown that the aspect of uncertainty avoidance has a negative moderating influence on this relationship (**H11**: $\beta=-0.186$, $p<0.01$). Indeed, the findings are in agreement with what has been hypothesized in this study. This conclusion informs that people with high uncertainty avoidance tends to develop a weaker relationship between Internet self-efficacy and behavioral intention to adopt a technology. In other words, the higher the level of uncertainty avoidance the lower the effect of Internet self-efficacy on behavioral intention. There are no comparable findings existing in prior literature to make any appropriate comparison between the current findings and earlier published findings. Further, the present study has verified that uncertainty avoidance has a negative moderating impact on the relationship connecting perceived compatibility with behavioral intention to adopt e-learning format (**H12**: $\beta=-0.282$, $p<0.001$). In reality, there is a total silence in contemporary literature about this type of hypothesis. For that reason, this study could be the first one to investigate the moderating influence of uncertainty avoidance cultural values on the relationship connecting perceived compatibility with behavioral intention to adopt e-learning technology.

5.2 Contribution to Theory

This study offers a number of notable contributions to our knowledge in the domain of technology adoption research. First, this study has formulated its own research framework that allows to propose certain hypotheses to serve the objectives of the current analysis, and some of which have never been researched in relation to e-learning environment in both developed and developing country contexts. Indeed, one important qualifying aspect of this analysis is that some of the findings are entirely missing from contemporary literature. Further, this research model fundamentally further improves our understanding of the dynamics of e-learning technologies and refines existing conclusions and reinforces perceptions and perspectives of learners and educators towards the adoption process of e-learning technologies.

Second, the present study has determined that prominent adoption-related factors (perceived usefulness, social influence, Internet self-efficacy and perceived compatibility) have strong effects on behavioral intentions to adopt e-learning format in a developing country context. However, the relationships between the latter two factors (Internet self-efficacy and perceived compatibility) and behavioral intention have not yet been largely applied on e-learning technologies in both developed and developing country contexts. Therefore, this contribution in itself is valuable because prior literature lacks these conclusions and also this enriches contemporary scholarly literature with novel empirical findings and conclusions. Third, critical review of prior literature has shown that there has been lack of adequate empirical researches addressing the moderating influence of Hofstede's cultural dimensions on the adoption process of e-learning technologies. Therefore, implementation of this study is imperative in improving our understanding how cultural values at individual-level shape individuals' behaviors, perceptions, perspectives and orientations in the process of making a decision to adopt e-learning environments. The outcomes of this study raise an awareness of paramount importance of the contributions of the current analysis as they inform and stimulate further research on this area, particularly research concerning the rest of cultural dimensions of Hofstede theory. In addition, the current contributions will fill the knowledge gap existing in current literature because these conclusions are surprisingly absent from literature.

Fourth, in effect, main stream adoption literature clearly reveals that projection of individualism-collectivism as a moderator on the adoption of e-learning technologies has been, to large extent, missing. For that reason, this study has been performed to fill this particular gap. Fifth, hypotheses were proposed, three of them are found significant as hypothesized. Quite unexpectedly, however, the moderating influence of individualism-collectivism on the relationship linking perceived usefulness with behavioral intention to adopt e-learning systems has been found statistically insignificant. This finding has come as a surprise because it is contrary to what has been conceptualized in literature. Without a doubt, it is a common convention in literature that individualistic cultures tend to embrace perceived usefulness in a greater proportion than collectivistic cultures. However, the finding of this study is consistent with findings concluded by a study investigating the adoption of e-learning technologies in a developing country context (Tarhini et al., 2017). The contribution presented in this study emphasizes that perceived usefulness is equally important for both individualistic and collectivistic cultures in impacting behavioral intentions to adopt e-learning technology. This contribution is significant in the sense that it opens the door for more investigative studies to prove whether this finding is relevant to other information technology domains and settings. Furthermore, the present findings have confirmed that the aspect of uncertainty avoidance has also no role to play on the relationship between perceived usefulness and behavioral intention. Earlier research indicates that findings have not been consistent and often conflicting. Apparently, this contribution by itself is significant because it adds to the controversy already in place which demands further analysis to be carried out concerning the influence of uncertainty avoidance on the relationship between perceived usefulness and behavioral intention.

Sixth, this has demonstrated that both individualism-collectivism and uncertainty avoidance positively moderate the relationship between social influence and behavioral intention to adopt e-learning. The present conclusions conform to previous findings. In effect, the current conclusions reinforce the common knowledge that collectivistic cultures and high uncertainty avoidance cultures are more influenced than their counterpart by the aspect of social influence to develop behavioral intention to adopt a technology. Seventh, this study has provided an empirical findings that both individualism-collectivism and uncertainty avoidance cultural values negatively moderate the relationships between Internet self-efficacy and intention and between perceived compatibility and intention to adopt e-learning technologies. These findings are in harmony with what has been conceptualized in this study. However, the conclusions of the present study have never been revealed in relation to the adoption of e-learning systems. Therefore, these contributions are of paramount importance because they have never appeared anywhere in existing literature for both developed and developing cultures. Therefore, this contribution provides a good chance to bridge the knowledge gap existing in contemporary literature.

5.3 Conclusions and Implications for Practice

Culture influences individuals' behavior in decision-making process, especially when taking a decision to adopt a new innovation. The current knowledge gap in present literature concerning the effects of cultural dimensions of Hofstede's topology on the adoption process of information technologies merits further researches to be implemented to provide a fundamental understanding of how the aspect of culture affects individuals' behaviors towards adoption of a new technology. The findings and conclusions of the current study provide several important insights and theoretical implications that can be translated into strategies, recommendations and practical implications for the benefits of accelerating and improving the adoption rate of e-learning processes in a developing country context.

First, the present findings have confirmed by providing strong empirical evidence that the perceptions of usefulness positively affect the formation of behavioral intention to adopt the technology under investigation. This particular finding informs that if the perceptions of usefulness are augmented the behavioral intention will also be amplified. According to TAM theory, perceived usefulness is a strong predictor of behavioral intention to adopt a new information-based technology and in the meantime this intention can be translated into actual use of the technology. As a result, strategies should be formulated to enhance the perceptions of usefulness. This can be achieved through the recognition of learners and educators that the technology is highly useful, technically-aligned with their job performance and seamlessly interactive with their experience. In addition, the e-technologies such as websites and their associated tools responsible for implementing e-learning systems must be designed to potentially promote user experience, able to be easily researchable for contents, highly useable, effective and efficient environments as well as innovative web interface design that delivers maximum flexibility leverage.

Second, this study has empirically verified that the determinant of social influence has a positive effect on behavioral intention to adopt e-learning system. This implies the higher the social influence the greater the behavioral intention to adopt e-learning technologies. This finding is of paramount importance in the sense that it can be exploited for the benefit of boosting the perceptions of intention in order to achieve greater adoption rates of e-learning technologies, particularly in developing countries contexts. According to several social theories that the aspect of social influence can be a pervasive force in modifying individuals' behavior and affecting their preferences towards adoption of a new technology, especially during social interaction and encounters. This finding points to the fact that Jordanians are exposed to the influence of social forces such as subjective norms and image concerns. Businesses and organizations must develop strategies that primarily have the intention to focus on augmenting various aspects of social influence by exploiting the surrounding environment such as friends, families and peers to trigger learners' and educators' perceptions for the benefit of accelerating the adoption rate of e-learning technologies. In addition to improving individuals' perceived image to promote their social status and prestige. As a result, businesses and organizations and other stockholders must be able to develop out of the box ways and methods with innovations to promote individual's perceived image and underline a positive societal impacts.

Third, the current study has empirically confirmed that Internet self-efficacy influences positively the behavioral intention to adopt e-learning systems. Thus, concerned organizations and academic institutions need to improve and extend learners' and educators' capacity and competency to use the Internet channel competently for effective implementations of e-learning systems. Strategies must be developed in order to increase the level of Internet self-efficacy among users in order to enhance their perceptions of intentional behaviors. The intended strategies should provide appropriate level of education and training to enable systems' users to be competitive and acquire the formative skills and knowledge requirements to meet the demands and challenges of the Internet technology. Further, developers of these strategies and interested practitioners must be mindful because the Internet keeps significantly evolving and staying current and informed with its ongoing developments and their implications is a herculean task. Fourth, perceived compatibility has been demonstrated to have a positive impact on behavioral intention to adopt e-learning technologies. The practical importance of this conclusion can be exploited in an effort to accelerate e-learning process by making the technology compatible with users' beliefs, expectations, needs, experiences, preferences, goals, culture and lifestyles. In reality, educational processes are required to have a high level of compatibility between the e-technologies and users because education is a lengthy process that consumes much time and needs a great deal of resources.

Fifth, this study has addressed at length the scarcity of theoretically-based empirical research analysis focusing on the moderating impact of individualism-collectivism and uncertainty avoidance cultural values at individual-level on the relationship between highly influential technology adoption factors (perceived usefulness, social influence, Internet self-efficacy and perceived compatibility) and behavioral intention. The present study has revealed that these factors have strong effects in enhancing the behavioral intention to adopt e-learning technologies in a developing country context of Jordan. To my knowledge, this is the first study to investigate the moderating impact of both individualism-collectivism and uncertainty avoidance on relationships linking Internet self-efficacy and perceived compatibility with behavioral intention in the domain of e-learning systems in both developed and developing countries settings. It is a de facto perception that culture manifests itself as a predominantly influential social conduit that significantly impacts individuals' behaviors in decision-making processes and in the process of taking actions. Apparently, finding ways to develop matured, effective and relevant strategies to exploit the influence of culture on technology adoption has not been an easy undertaking and effectively hard to synthesize. It is a fact that culture is a powerful force that eats everything for breakfast, and in the meantime dramatically changing one's culture is an upheaval task.

However, in-line with the current findings regarding the moderating impact of cultural values at individual-level addressed in the present study, strategies should be formulated and implemented to accelerate the adoption rate of the technology under investigation through improving the perceptions of behavioral intentions towards technology acceptance and use. The current finding has shown that the link between perceived usefulness and intention is insensitive to variations in cultural values. This implies that the technology resonates similarly across varying cultures. Therefore, there is no need to segment learners and educators according to culture perspectives in this specific case. Further, in accordance with current findings, any strategy developed to promote the aspect of perceived usefulness of the technology may not include the elements of culture.

The individualism-collectivism and uncertainty avoidance cultural values have been determined to positively moderate the link between social influence and behavioral intention to adopt e-learning. The practical implications of this finding are fundamentally significant because it informs that the aspects of social influence can be utilized to enhance the adoption of a technology, and this can be accomplished via enhancements of social aspect among collectivists but not individualists. In addition to what has already been mentioned in previous paragraphs, there are also many ways and methods to prompt social aspects among learners' and educators' of collectivistic cultural context: namely, exploiting families and communities to propagate the importance of social aspects among individuals in triggering them to use the technology, utilizing instrumental ways to endorse individuals' prestige and social status and stimulating learners' subjective norms and perceived image through social medias in order to create an appropriately encouraging educational setting that enhances individuals' perspectives and perceptions towards adoption of e-learning technologies.

Finally, the current analysis has empirically demonstrated that both relationships connecting Internet self-efficacy and perceived compatibility factors with behavioral intention to adopt e-learning systems are negatively moderated by cultural values included in this study, implying that the higher the degree of individualism-collectivism and the greater the degree of uncertainty avoidance the weaker the influence of these factors on intention to adopt e-learning technologies. The present study proposes that these factors and how cultural values affect their influence on behavioral intentions provide valuable points of reference for the benefit of deploying instrumental and effectively indispensable practical interventions among individualists to positively augment their perceptions towards the adoption of e-learning technologies.

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