CHAPTER FIVE
DISCUSSION

5.1 Introduction

This chapter presents the outcomes that were obtained from data analysis in the previous chapter. The overall purpose of this study is to gain a better understanding of e-learning adoption and the technological, organizational, personal and social environmental factors that influence e-learning adoption and impacts of e-learning among working adult in Jordan.

5.2 Discussion

First, the discussion will be made on the characterizing of e-learning adoption groups. Then discussion on technological, organisational, personal and social environmental factors that are associated with e-learning adoption. Finally, the impact on working adults as the result of e-learning adoption will be discussed.

5.2.1 Characterizing E-Learning Adoption

The approach of describing e-learning adoption in the previous studies has basically relied on two contexts namely "adopted or has not adopted e-learning". It must be stated that, these studies have emphasizing adoption only upon one perspective of e-learning adoption (e.g. Hung *et al.,* 2009; Duan *et al.,* 2010; Sumak et *al.,* 2011). The present study aimed to describe adoption by emphasizing upon both the level of e-learning

applications adopted and the extent of usage of these applications in order to provide an alternative approach to describe of the adoption of e-learning among adult workers in Jordan.

With regards to extent of usage, it is perceivable that the degrees to which working adults shift from conventional mode of educating to opt for internet technologies. Chin and Marcolin (2001) suggested that, real utilization of the technologies presents a better perceptive on innovation adoption. However, this fact has been disregarded in prior technology adoption research. In the present research, the adoption is described as triggering usage of applications on a limited basis leading to the final stage whereby an application would be substituted for an existing traditional learning method.

In order to achieve the objectives, this research has expanded a framework to describe e-learning adoption on a two-dimensional matrix indicating level of adoption and extent of usage. With regards to the level of adoption, it was represented by ten types of e-learning application. The extent of usage, on the other hand, was measured by means of four categorical scales labelled as 'Not using', 'Used sometime', 'Used most of the time' and 'Used all the time'.

For the purpose of describing the extent of usage for each e-learning application, visual approach has been applied in this present research. Based upon a research sample of 502 working adults, results presented on the matrix table providing information on what applications have been adopted and the usage of these applications by working

adults. The significance of visual approach is in its adaptability, without being restricted by the measurement scale when identifying adoption patterns. Furthermore, this approach provided different resulted in types of adoption patterns by the working adults in the sample. To enable further analysis on e-learning adoption, three groups of working adults are derived based on re-grouping similar patterns. These groups were then classified into 'low adopters', 'moderate adopters' and 'high adopters'.

The first group is the low adopters, represents about 31 percent (152) of the research sample. Low adopters were involved in the early stage of e-learning adoption. As far as the low adopters are concerned, they primarily adopted applications that show their web presence, mainly on the basis of 'used most of the time'. Low adopters have exchanged e-learning applications for the conventional mode of learning. For this group, the applications which were adopted by these adult workers are restricted. The primary e-learning applications adopted by the adult workers are e-mail, online registration, online library, online grades and accessing online course material. The outcome from this research showed that these adopted types of application are predominantly adopted by adult workers. In addition, as deliberated in the literature review, a great number of learners including adult workers were not familiar with the modern technology owing to the fact that e-learning adoption is an advanced method of learning to many students (Abbad & Nahlik, 2009). In other words, students who had more experience of using the technology will find it easy to use a learning management system rather than students with less IT experience (Morss, 1999).

The second group which is the moderate adopters represents about 45 (224) percent of the research sample. With regard to moderate adopters, they utilized a great number of the applications indicating their web presence on a "used most of the time basis". The moderate adopters have switched e-learning applications to conventional modes of undertaking learning. The adopters have primarily adopted e-mail, online registration, online library, online grades, online course material, online test, online assessment and online chat. Moderate adopters have taken the first step to adopt more advanced internet technologies and have partially integrated e-learning applications. Nevertheless, there were eight out of ten applications adopted by moderate adopters mainly being used most of the time. However, full integration of e-learning applications has not been implemented for this group.

The third group is the high adopters, representing about 25 percent (126) of the research sample. High adopters in comparison to the moderate adopters, used the e-learning applications on a more frequent basis, whilst only a number of high adopters have replaced e-learning applications for conventional modes of undertaking learning. High adopters have placed strongly emphasises on the adoption of all ten applications compared to the other two groups. These adopters have primarily adopted e-mail, online registration, online library, online grades, video, online chat, audio, online course material, online test and online assessment. The results from the matrix in Table 4.41 also showed that high adopters have adopted e-learning applications exclusively on "used most of the time basis". These adopters have the high tendency to adopt all e-learning applications compared to low and moderate adopters. Working adults who are comfortable with e-learning system will probably become users, owing to the fact that

they are more confident. Results from this research reflected that most of the e-learning applications provided by the Arab Open University in Jordan (AOUJ) to adult workers are primarily “used on most of the time”.

To summaries, the ten e-learning applications were ranked based on their usage in the following order; e-mail, , online library, online registration, online grades, online course material, online test, online assessment, online chat, live audio, and live video. From matrix table, it is observed across the ten e-learning applications that e-mail showed the highest level of usage; in contrast, live audio, and live video showed the lowest level of usage.

5.2.2 Factors Associated With E-Learning Adoption

One of the objectives of this research is to identify factors that are associated to e-learning adoption. This section discusses the outcomes from the analysis results. The multinomial logistic regression was used to examine the relationship between technological, organisational, personal and social environmental factors as independent variables, against the three adoption groups as dependent variables.

This study found that technological, organizational, personal and social environmental factors are associated with the utilization of e-learning adoption among adult workers. Thirteen out of seventeen variables were associated with at least one group of adopters which are relative advantage, complexity, system quality, information quality, service quality, top management, structure, culture, social contact, professional

advancement, cognitive interest, normative and mimetic. Table 5.1 below summarizes the outcomes for significant factors.

Table 5.1 Factors Related to E-Learning Utilization

Factors	Low-adopters vs. High-adopters	Moderate-adopters vs. High-adopters	Moderate-adopters vs. Low-adopters
Relative advantage	✓		
Complexity	✓		✓
System quality	✓		
Information quality	✓		✓
Service quality			✓
Top management	✓		✓
Structure	✓		
Culture	✓		✓
Social contact	✓	✓	
Professional advancement	✓		✓
Cognitive interest	✓		✓
Normative	✓		✓
Mimetic	✓		✓

Relative advantage, complexity in adopting new technologies, system quality, information quality, service quality, top management, structure, culture, social contact, professional advancement, cognitive interest, normative and mimetic are significant factors that differentiate between low adopters from high adopters. These factors could motivate low adopters for initiating their web presence and this may imply these low adopters are perceived as less ready in terms of availability and accessibility to resources to adopt e-learning. However, only one significant factor that differentiates between moderate adopters from high adopters which is social contact. With regards to the

differences between moderate adopters and low adopters, there are nine considerable factors that differentiate between them namely complexity, information quality, service quality, top management, culture, professional advancement, cognitive interest, normative and mimetic.

5.2.2.1 Technological Factors

It has been deliberated in this research five technological factors which are associated to e-learning adoption among different groupings which are relative advantage, complexity system quality, information quality and service quality. It was discovered that relative advantage is important factors that differentiate low adopters from high adopters. Complexity is other important factors that differentiate low adopters from high adopters and moderate adopters from low adopters. Further, as far as low adopters and high adopters are concerned, five factors namely relative advantage, complexity, system quality, information quality and service quality are essential factors that differentiate between low adopters and high adopters. These technological factors will potentially enhance the learning process in the developing countries, and this encourages the developing countries towards the implementation of e-learning in the education sector. The adoption of such technology to achieve the educational practical quality and skip the geographical constraints helped in the spread and adoption of e-Learning.

On the other hand, there are three factors namely complexity, information quality and service quality considerable technological factor that differentiates between moderate

adopters and low adopters. There are a five technological factor which were essentially related to the different groupings of e-learning adoption in respect of adult workers which involve relative advantage, complexity system quality, information quality and service quality. Low adopters vs. high adopters were found significantly associated with these technological variables compare to others groups. The results for significant factors of technological factors associated with various groups of e-learning adoption are summarised in Table 5.2.

Table 5.2 Technological Factors Associated with E-Learning Adoption

Factors	Low-adopters vs. High-adopters	Moderate-adopters vs. High-adopters	Moderate-adopters vs. Low-adopters
Relative advantage	✓		
Complexity	✓		✓
System quality	✓		
Information quality	✓		✓
Service quality			✓

It must be pointed out that this finding is in line with the outcomes in previous studies which have unravelled these technological factors as an essential variable in the adoption of e-learning technologies (Holcombe, 2000; Martins *et al.*, 2004; Liao & Lu, 2008; Hung *et al.*, 2009; Hsbollah & Idris 2009; Duan *et al.*, 2010; Lo et al., 2010; Mayoka1 & Kyeyune, 2012; Zaied, 2012).

To conclude, the involvement in the adoption of new innovations is essentially promoted by relative advantage (Iacovou & Benbasat, 1995; Mehrtens *et al.*, 2001; Kendall *et al.*, 2001; Hsbollah & Idris 2009; Duan *et al.*, 2010; Mayoka1 & Kyeyune,

2012). As shown in chapter two, the study on the dissemination of previous technology, has also revealed the fact that relative advantage is among the factors essential in the adoption of new technology. Additionally, e-learning developers must consider providing e-learning adoption applications that are more appropriate to the students' needs, as this could enhance their usage of e-learning adoption. Relative advantage is only associated to Low adopters vs. high adopters and not other adoption groups.

This study has revealed further evidence that perceptions of complexity are positively associated with e-learning adoption among adult workers between moderate adopters and low adopters. Prior researches have emphasized that one main barrier to user adoption of a system, is the users familiarity with adopting system (Moon & Kim, 2001; Mayoka1 & Kyeyune, 2012). In this study, the importance of complexity is illustrated by its significant impact on adoption of e-learning between moderate adopters from low adopters and high adopters from low adopters. Complexity is the most significantly associated to moderate adopters vs. low adopters and not other adoption groups. In interacting and dealing with a new pedagogical technology such as e-learning, if the adult workers or students perceive e-learning as complex and difficult, it might deterred adult students from using such the system (Pituch & Lee, 2006; Mayoka1 & Kyeyune, 2012).

Complexity is intangible in that adult workers perceive that skills required to implement are too complex. When adult workers have more experience with e-learning, the complexity of perceived innovation characteristics on intentions to use e-learning are different from that of inexperienced adult workers. This is similar with the results from

previous research that have found complexity factor to be a significant and play important role in the adoption of e-learning among students including adult workers (Hung *et al.,* 2009). An e-learning system should be easy to use. In addition, the university management should demonstrate the use of the system to the Adult workers to familiarise them with it prior to implementation (Davis *et al.,* 1989; Rogers, 2003).

Beside relative advantage and complexity, the system quality, information quality and service quality are other important factors that have positively influence on decision e-learning adoption among adult workers between low adopters and high adopters, and low adopters and moderate adopters in this study. Prior studies revealed that these three factors are a significant variable in the procedure of adopting new technology such as e-learning (Chung & Skibniewski, 2007; Lo et al., 2010; Zaied, 2012).

The findings are supported by a recent study by Lo et al., (2010) and Zaied, (2012) which indicate that the system quality, information quality, and service quality are determinants of behavioural intention in using e-learning among students in higher education. Low adopters vs. high adopters were found significantly associated with these technological variables compare to others groups. System quality shows a considerable influence on e-learning adoption among adult workers between moderate adopters from low adopters and high adopters and low adopters. Accessibility and reliability of e-learning adoption system thus, can be said to have a significant influence in the usage of e-learning (Wang & Liao, 2008; Lee & Chung, 2009; Zaied, 2012).

The findings also reveal that the positive effect of information quality on e-learning adoption among adult workers between moderate adopters from low adopters and high adopters and low adopters. In other word, if the information quality is increase, the e-learning user's adoption to use will also increase. Information quality is the most significantly associated to moderate adopters vs. low adopters and not other adoption groups. Additionally, updated and sufficient information provided by e-learning system will definitely result in enhancing e-learning adoption systems in Jordan. In terms of service quality, the findings were also appears to have a strong influence on e-learning among adult workers between moderate adopters from low adopters. It is in line with previous studies (Saeed, Hwang & Yi 2003; DeLone & McLean 2003; Wang & Liao, 2008; Lee & Chung, 2009; Zaied, 2012). The service quality provided by the system provider in terms of accuracy, correct, and ideal service are important in generating intention to use e-learning.

5.2.2.2 Organizational Factors

Three organizational factors were found to be associated with different groupings in respect to e-learning adoption among adult workers namely top management support, organizational structure and organizational culture. The results showed that top management support is a vital factor that differentiates between moderate adopters from low adopters and low adopters from high adopters of e-learning adoption. Organizational culture is the essential factor that differentiates low adopters from high adopters and low adopters from high adopters. Organizational structure is a vital factor that differentiates

between low adopters from high adopters of e-learning adoption. The results of significant factors of organizational with various groups of e-learning adoption are summarised in Table 5.3.

Table 5.3 Organizational Factors Associated with E-Learning Adoption

Factors	Low-adopters vs. High-adopters	Moderate-adopters vs. High-adopters	Moderate-adopters vs. Low-adopters
Top management support	✓		✓
structure	✓		
Culture	✓		✓

An adult worker's decisions to adopt for e-learning are influenced by the top management's acceptability. One mean of improving management acceptability is to provide exposure to top management's staff of the e-learning technology and improve their perception on it; these interventions should be successful as they have revealed that the lack of familiarity by the top management on the e-learning technology obstacle for dissemination of new innovation (Attewell, 1992).

It was revealed that top management support was found to influence the adoption's decision of e-learning among adult workers. This is similar with the results from previous research that have found top management support factor to be significant and play an important role in the adoption decision of e-learning system (Hung *et al.*, 2009). It was revealed that the implementation of an online learning and development system relies heavily upon firm backing from top management and was central for its success (Smethurst, 2006).

Furthermore, resistance to this new technology is an unavoidable as e-learning is radically different from conventional means of employee training. In such circumstance, it would be vital that top management backing is needed for the adoption of e-learning system. Hence, it is the duty of the proponents to e-learning adoption to place an emphasis on developing awareness amongst top management the advantages of this technology to gain their support (Hung *et al.,* 2009).

The findings also reveal that the organizational structure has a significant influence on e-learning adoption among adult workers between low adopters from high adopters. This finding is also consistent with McFarlane, (2011) who found that organizational structure in the context of online pedagogical influence the attitude toward adopting e-learning. Organizational structure influence the organization's decision making and ability to improve and apply effective educational process in communicating organizational shared ideas and values, especially in diverse learning environments where the influence of technology and policies shape decisions and outcomes. Besides, the finding is also supported by Russell and Hoag (2003) who indicate that the organizational structure factor is significant and positive with users' perceptions of the innovation, and thus, adoption of e-learning. Therefore, the influence of organizational structure factor is expected due to its significant effects that are supported extensively in the existing literatures.

Organizational culture is another important variable which affects e-learning adoption. It must be stressed that organizational culture determines both the formal and informal mode of communication among members and with other people beyond the

walls of the institution (Deshpande & Farley, 1999). It was discovered that similar values, norms, assumptions, beliefs and ways of living are familiarly shared among members belonging to the particular organizational establishment (Hill & Jones, 2001). An innovative organizational culture can encourage novelty technology before they are widely accepted (Wallach, 1983). There is a high likelihood that dynamic organizational culture which is more likely to result in the decision for IT adoption (Kitchell, 1995; Fink, 1998).

Organizational culture, however, was further discovered to be an essential determinant in arriving at the resolution to adopt e-learning among adult workers between low adopters from high adopters and differentiates moderate adopters from high adopters. This finding affirms the previous studies which have discovered that organizational culture is essential and plays an important role in the adoption decision of e-learning (Parker, 2000; Meterko *et al.*, 2004; Rad, 2006; Hung *et al.*, 2009). In a more specific manner, adult workers with innovative culture were more likely to adopt e-learning systems than those with the bureaucratic culture to adopt e-learning systems. As a summary, this study deduced that top management support, organizational structure and organizational culture have a significant impact on adult workers' adoption of e-learning. In addition, the relationships among the constructs in DOI are significant.

5.2.2.3 Personal Factors

Three personal factors were found to be associated to different groups of e-learning adoption among adult workers which are social contact, professional advancement and cognitive interest. Cognitive interest factor is differentiating between moderate adopters from high adopters and low adopters from high adopters. It was found that professional advancement and social contact are the essential factors that differentiate between moderate adopters from low adopters and low adopters from high adopters. The findings for personal factors among various groups of e-learning adoption are summed up in Table 5.4.

Table 5.4 Personal Factors Connected to E-Learning Adoption

Factors	Low-adopters vs. High-adopters	Moderate-adopters vs. High-adopters	Moderate-adopters vs. Low-adopters
Professional advancement	✓		✓
Social contact	✓	✓	
Cognitive interest	✓		✓

The following are the results in respect of personal factors. Firstly, it was established in this research that the involvement of adult workers in adopting for e-learning was essentially associated with professional advancement. It was pointed out that professional advancement was the factor that differentiates between moderate-adopters from low-adopters and low adopters from high adopters. This finding concurs with the findings from past studies which revealed that professional advancement is vital and has a significant relationship with adoption of e-learning (Raghavan & Kumar, 2008). This fact affirms the assertion by Halliday (1989) Merriam and Caffarella, (1991)

and MacBrayne, (1995) that professional advancement aims to targeted and improve the efficacy of the learning among adult workers, personally or in group by means of fresh experience and ideas and transforming conditions, thus enhancing the value of the occupation.

Secondly, social contact was the second most important motivator factor to enroll e-learning adoption among adult workers. The informational data obtained in this study is similar to those revealed by other researches which have shown that motivation for participation to be attributable to social contact (Bynum & Seaman, 1993; Garofolo, 1995; Kim & Merriam 2004). Adult learners often adopt social relationship or social contact as an influencing factor in their participation to enroll e-learning (Furst & Steele, 1986). Cognitive interest is another significance factor motivating the involvement of e-learning adoption among working adults. It has been found that adult workers involved in learning out of compliance with the external of other parties. The parties were described as follows; usually the workers' employers, friends, religious head or counselor on adult workers involvement in learning.

5.2.2.4 Institutional Forces Factors

The research aimed to examine social environmental factors by applying the institutional forces theory. The result illustrates that two institutional forces were found to be associated to different groups of e-learning adoption among adult workers which are normative and mimetic. It was pointed out that normative was the factor that differentiates between moderate-adopters from low-adopters and low adopters from high adopters. Additionally, mimetic factor is differentiating between moderate adopters from high adopters and low adopters from high adopters. As a summary, the institutional forces with various groups of e-learning adoption were significant. This finding affirms the previous studies which have discovered that social environmental factor is essential and plays an important role in the adoption decision of e-learning (Tosun & Baris, 2011; Jan et al., 2012). The results of significant factors of social environmental with various groups of e-learning adoption are summarised in Table 5.5.

Table 5.5 Social Environmental Factors Connected to E-Learning Adoption

Factors	Low-adopters vs. High-adopters	Moderate-adopters vs. High-adopters	Moderate-adopters vs. Low-adopters
Normative	✓		✓
Mimetic	✓		✓

The researcher indicated that the results may shed light on how adult workers can gain better plan their e-learning program and thus accelerate the rate of adoption. E-learning program can gain maximum benefit from social influences that could result in an organization's adult workers attitude towards adopting e-learning bandwagon. When an

increasing number of employees do that, organizational investments in human capital could be more efficient. Specifically, adult workers may need to work on enhancing their mimetic and normative. With regard to normative forces, adult workers are a great need to grow an e-learning conduct and community referral champions to create normative expectations. In terms of mimetic forces, it appears that e-learning adopters with high profiles may impact e-learning adoption of others with lower profiles. Adult workers may provide success stories of the e-learning experiences high-profile employees and enhance word of mouth marketing in the e-learning context (Jan et al., 2012).

5.2.3 E-Learning Outcome on Adult Workers

This section describes the impact of e-learning based on two measurements which are the impact on adult learners in relation to their study as well as to their job performance. In addition, another aspect that is included in this section is the distinctions of these impacts amongst the three e-learning adoption groups.

The other objective of the current study is the deliberation on the associated between e-learning adoption and the performance. In an effort to look into this matter, Halawi & Pires (2009) assessed e-learning among learners through WebCT based on Bloom's taxonomy. The taxonomy is marked in the assessment of the relationship between impacts on learners as the result of e-learning adoption. Similarly, studies on e-learning systems success that has impact on adult learners in terms of their job was also examined into by Wang *et al.*, (2007). Furthermore, it is notably used in the examination of the links between impacts on learners as consequences of e-learning adoption. Even

though causal relationships were not observed from the study, the result somewhat established that adult workers were influenced by e-learning adoption. A few differing impacts were noted through various adoption groups.

5.2.3.1 E-Learning Impact on Adult Learners in term of their Study

E-learning is an effective learning tool in the perspective of Bloom's taxonomy (Kartha, 2006; Suanpang & Petocz 2006; Vidakovic et al., 2003). The importance in Bloom's taxonomy is that, it offers an empirical measurement to analyze the distinction between online learning and conventional classroom-based learning. This taxonomy has been employed to assess the efficacy of e-learning and it is widely known and acknowledged.

Factor analysis was carried out on the impact on adult learners in term of their study variable revealed the identification of one factor and was classified into e-learning academic performance. The empirical findings of the current study established distinction among the three adoption groups on the basis of academic performance. Nevertheless, evidence of contrasting gains accrued by different adoption groups is also being observed. The findings show that high-adopters have gained higher study performance compared to low-adopters and moderate-adopters. The results established that high-adopters vs. low adopters have attained higher academic performance in comparison to high-adopters and moderate-adopters. The research carried out by Halawi and Pires (2009) affirms the outcomes of this present research which established the essential

distinction between learners in various levels of information systems specifications based upon Bloom's taxonomy.

5.2.3.2 E-Learning Impact on Adult Learners in term of their Job

The importance of performance among the adult learners with regards to e-learning adoption is that it motivates learners. The learners who can access and navigate courses in a short period of time as well as those who can see its significance in relation to their work is highly likely to be involved in e-learning. Learners that can quickly access and navigate courses and see the relevance of what they are learning with their jobs will be more likely to become engaged with e-learning. This is realizable upon the types of analyses that are conducted at the beginning of the e-learning solution.

On the other hand, the factor analysis undertaken on the impact upon adult learners in relation to their job variable has resulted in the identification of one factor namely job performance. Whilst, in relation to job performance, it has been established that there are crucial distinctions among the three adoption groups. Nevertheless, evidence of contradicting accomplishments attained by various adoption groupings is also under assessment. The results established that high-adopters compared to moderate-adopters and low adopters were able to attain much better job performance in comparison to low-adopters and moderate-adopters.

Further, the outcomes of this research indicate a legitimate relationship between e-learning adoption and job performance. The knowledge acquisition among adult

employees as well as their ability and job perceptions through e-learning adoption is depicted in the findings of this study. It is shown that e-learning adoption has been to assists with job performance and satisfaction. E-Learning adoptions are constructed to undertake the course of learning. The results in the fundamental learning circumstance indicate that those using e-learning gain benefits from its adoption in the virtual learning context. The transfer of acquired knowledge, skills and work attitudes from the training period to the work is another result of e-learning adoption among adult employees and this facilitates conflict resolution which is reflected in the improvement of the entire work outcomes. The findings of the present research established distinctions based on job performance among learners. This is affirmed by the studies undertaken by Waight and Stewart (2006), Wang *et al.*, (2007) and Chen (2010).