

Challenges of Application ICTs in Technical and Vocational Training from Students' and Instructors' Perception in Maragheh

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Abstract

This study was conducted to identify challenges of application information and communication technology (ICTs) in Technical and Vocational Training. Using the factor analysis, the challenges have been classified into eight factors (Technical, economical, services, support, educational, cultural, legal, and educational planning) from students' perception and five factors (legal, technical, educational, economical, and cultural) from instructors' perception. Several suggestions have been made based upon these findings.

Keywords: *Information and Communication Technologies (ICTs); Technical and Vocational Training; Challenges*

1. Introduction

Vocational education (also known as vocational education and training or VET) is an education that prepares people for specific trades, crafts and careers at various levels from a trade, a craft, technician, or a professional position in engineering, accountancy, nursing, medicine, and other healing arts, architecture, pharmacy, law etc. Craft vocations are usually based on manual or practical activities, traditionally non-academic, related to a specific trade, occupation, or vocation. It is sometimes referred to as technical education as the trainee directly develops expertise in a particular group of techniques. Vocational education can be at the secondary, post-secondary level, further education level and can interact with the apprenticeship system. Increasingly, vocational education can be recognized in terms of recognition of prior learning and partial academic credit towards tertiary education (e.g., at a university) as credit; however, it is rarely considered in its own form to fall under the traditional definition of higher education.

According to an interview has been conducted in Maragheh's agricultural collage: Lack of related equipment, ICT knowledge, teaching ability from instructors along with lack of motivation from head mangers lead to low level of instructors' motivation for implementing ICT tools in their teaching. On the other words, they prefer traditional methods.

Expanding e-learning brings several attractive opportunities for organizations: (1) save time, cost, and effort; (2) satisfy educational needs from remote areas; (3) provide self-learning opportunities; (4) have a positive impact on the learning process; and (5) provide a mechanism for collaborative learning (Karmakar, 2000). To achieve these opportunities, a holistic viewpoint along determination of the challenges of the ICT- based training system is required. Implementation of such system without consideration of the above aspects will be defeated.

Maragheh is a city in and the capital of Maragheh County, East Azerbaijan Province, Iran. At the 2006 census, its population was 146,405, in 38,891 families. Maragheh is situated on the bank of the river Sufi. The Azeri-speaking population form majority in the city. It is located 130 kilometers (81 mi) from Tabriz.

The objectives of this study are as follows: 1) identify challenges of the ICT- based training system from students' perception, 2) identify challenges of the ICT-based training system from instructors' perception.

2. Prior Studies

The need for e-learning has as many different answers as the number of different perspectives on e-learning that people have. E-learning is seen as desirable from a number of perspectives. It was outlined as following: (1) in many disciplines, shortage of qualified teachers is a problem plaguing most educational institutions. The quality of the available teachers is another major concern. While hardly anyone looks at e-learning as an alternative to traditional teaching, in this context, it is seen to expand the reach of the available teachers; (2) A3 (any time, any place, any pace) learning. For many, the need to come together at a fixed place at a fixed time is a major constraint. This is particularly true for those pursuing courses in part-time mode, the just-in-time learners, adult learners, *etc.* The freedom to connect to the course setup at any time of your choice, and from any place is a major incentive for e-learning. It also enables learners to take to studying when they feel is the best time for them to study; (3) Enhanced learning experience. This is a very important, but often ignored and under-explored aspect. When exploited effectively, e-learning enables a high degree of personalization and a wide range of instructional methods. Powerful simulation environments, multimedia capability and high-end visualization support enables a learner to relate to the subject much more deeply and hence understand well; (4) Enhancing quality of teaching. When one gets into practicing e-learning to any significant degree, one will be creating much of the course material electronically. These are a lot more reusable compared to written notes, used otherwise; (5) More systematic feedback and evaluation. Bringing assessment and other activities under e-learning enables students to gather much more detailed feedback on various aspects of the course. These include quality of questions, quality of content, qualitative judgment on students' performance, *etc.* These can be used to enhance the quality of instruction at an institutional level [1].

Simply defined, challenge is a new or difficult task that tests the ability, capacity, and skills of a person, organization or community. In a challenging environment, one may find threats and change them into opportunities, which is the desired outcome of a dynamic system. On the other hand, if people who are involved in a system are not familiar with of its potential challenges, these challenges will be transformed into threats; with additional information, however, they can be transformed into opportunities [11]. Therefore, along with designing a system, it should identified challenges and provides some practical ways to transform them into opportunities.

Many studies have identified the challenges affecting an ICT-based training system. For instance, Bersin, Holder and King (2003) implied to content development, Infrastructure and deployment challenges [2] while Sim and Fersht (2007) pointed out to Lack of IT infrastructure, lack of governmental and cultural support, corporate attitude that does not value training challenges [9].

White *et al.*, (2003) mentioned to Time constraints. Education requires several time factors: preparation time, teaching time, grading and evaluation time, and communication time. The most frequent response from respondents as to why they have not been involved with e-learning was inadequate time [10].

Leary & Berge (2005) implied to Hands-on component which needs face-to-face training challenges [7] while Cantoni *et al.*, (2004) implied to Lacking informal social interaction and face-to-face contact of traditional learning challenges [3].

Datuk and Ali (2005) implied to the following barriers. (1) Awareness: Generally there is still a lack of awareness amongst the population, especially parents, of the effectiveness of e-learning. Many parents feel the traditional learning mode is better; (2) Low Adoption Rate Most institutions are keen to embrace e-learning. Nevertheless, issues like lack of e-content, inadequate infrastructure coupled with the problem of digital divide, has resulted in a relatively low adoption rate; (3) Bandwidth Issue and Connectivity: Engaging content requires a rich combination of multimedia components. This creates frustration and boredom among learners and affects the ease of learning; (4) Computer Literacy and Digital Divide: There is a large segment of the

population that is computer illiterate. This is especially true in the rural areas. This hinders the introduction and implementation of e-learning; (5) Lack of Quality of E-Content: Most of the e-learning content has low interactivity and moderate impact on learners; (6) Difficulty in Engaging Learners Online: Engaging learners actively is one of the key factors in determining the success of an e-learning program. Online learning requires a very high degree of self-motivation which is found to be lacking among the learners. Learners find it difficult to migrate from the traditional learning mode to the new e-learning mode; (7) Language Barrier The extensive use of English in e-learning contents is also one of the factors that have hindered the success of e-learning, especially in non-English speaking countries [4].

Using previous studies and interviews with some experts in the field of e-learning in the agricultural sector, it can be considered the following theoretical framework for the current research (Figure 1).

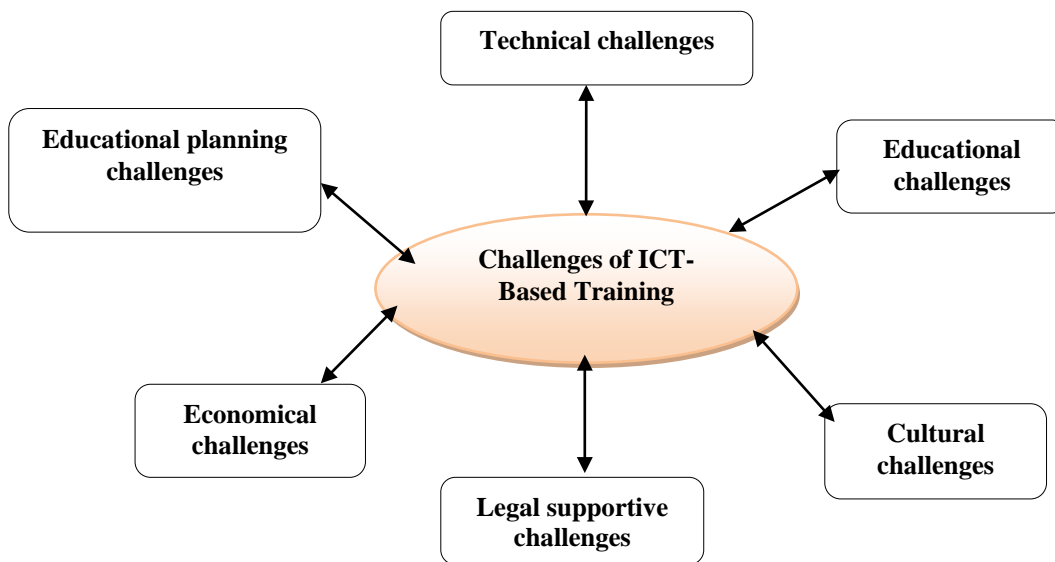


Figure 1. A Theoretical Framework of Challenges of ICT-based Technical and Vocational Training

3. Research Design

The methodology used in this study involved a combination of descriptive and quantitative research. Questionnaire items were developed based on the previous literature and objectives. The questionnaire was revised with the help of experts with significant experience to examine the validity of the research model. A 5-point likert scale ranging from 1 as strongly disagrees to 5 as strongly agree was used for the measurement. A pretest for the reliability of the instrument was conducted with 25 students randomly chosen in agricultural collage in Maragheh. It summarized challenges into one single variable, C. The computed Cronbach's alpha for C. is %87, which indicated the high reliability of the questionnaire.

The research population included all the instructors (N=120) and students (N=980) in agricultural collage in Maraghe. Because of small population of instructors, all of them were studied. Using the stratified sampling technique and the results from the pilot test and Cochran sampling formula 189 students were surveyed.

$$n = \frac{980(1/96)^2(0/39)^2}{980(0/05)^2 + (1/96)^2(0/39)^2} \approx 189$$

This research applied SPSS Software to analyze the data. Data was analyzed using the factor analysis. KMO index along with the Bartlett test verify appropriateness of the collected data for explanatory factor analysis.

4. Results

Demographic Profile of Students and Instructors

Table 1 summarizes the demographic profile and descriptive statistics of students while Table 2 summarizes the demographic profile and descriptive statistics of instructors.

Table 1. Demographic Profile and Descriptive Statistics of Instructors

Age/year	Mean=41.42	S.D=7.36
Degree	B.S=7.1%	M.S=92.9%
Computer usage (weekly)/hour	Mean=14.21	S.D=7.25
Internet usage (weekly)/hour	Mean=11.6	S.D=6.24

Table 2. Demographic Profile and Descriptive Statistics of Students

Age/year	Mean=21.65	S.D=2.15
Computer usage (weekly)/hour	Mean=11.9	S.D=7.4
Internet usage (weekly)/hour	Mean=11.7	S.D=11.1

Challenges of the ICT-based Training System from Instructors' Perception

Implementation of factor analysis summarizes all challenges into 5 factors given by Table 3. Factor one is composed of the following challenges. Lack of accurate strategic in IT (information management), existence of multiple decision centers in using educational technologies in schools, instructors and managers not taking virtual education seriously. These challenges are clearly related to legal factor. So it was named legal challenge.

Factor two is composed of the following challenges. Low bandwidth; Lack of appropriate hardware; lack of appropriate software; Lack of appropriate infrastructure for virtual education; Limited access to internet at home; the limitation of virtual training for operational techniques. These challenges are related to the technical aspect. So it was named technical challenge.

Factor three is composed of the following challenges. Language barrier, lack of ICT knowledge and skills; lack of appropriate educational content, lack of appropriate need assessment, lack of educational planning. Factor tree was labeled as educational methods.

Factor four is composed of the following challenges. High expenses of buying equipment; High expenses for the recruitment of experts; High expenses of maintenance; High expenses for support and up-to-date training; High expenses of upgrading and changing pieces; High expenses of preparing digital content. These challenges are related to the financial aspect. So, factor four was labeled as economical challenges.

Factor five is composed of the following challenges. Prejudiced beliefs of learners; lack of understanding of advantages and disadvantages of virtual education; Negative experiences of users; technological phobia; wasting time by surfing the internet. Factor five was labeled as cultural challenges.

Table 3 represents portion of each factor from the total common variance. As one may observe that about 73.2% percent of total common variance explained by these 5 factors, which the majority of it has been explained by the legal factor.

Table 3. Factor Analysis of Challenges from Instructors' Perception

Factor name	Eigen value	Explained common variance by factor
Legal	4.798	19.956
technical	4.338	18.041
educational	3.852	16.022
economical	2.608	10.849
cultural	1.026	8.425

Challenges of the ICT-based Training System from Students' Perception

Implementation of factor analysis summarizes all challenges into 8 factors given by Table 4. Factor one is composed of the following challenges. Low bandwidth; Lack of appropriate hardware; lack of appropriate software; the limitation of virtual training for operational techniques. These challenges are related to the technical aspect. So, factor one was labeled as technical challenges.

Factor two is composed of the following challenges. High expenses of buying equipment; High expenses for the recruitment of experts; High expenses of maintenance; High expenses for support and up-to-date training; High expenses of upgrading and changing pieces; High expenses of preparing digital content. These challenges are related to the economical aspect. So, factor two was labeled as economical challenges.

Factor three is composed of the following challenges. Limited access to internet at home; Lack of appropriate infrastructure for virtual education. These challenges are related to the service aspect. So, factor three was labeled as service challenges.

Factor four is composed of the following challenges. Lack of accurate strategic in IT (information management), instructors and managers not taking virtual education seriously. These challenges are related to the ICT support aspect. So, factor four was labeled as support challenges.

Factor five is composed of the following challenges. Language barrier, lack of ICT knowledge and skills. These challenges are related to the educational aspect. So, factor five was labeled as educational challenges.

Factor six is composed of the following challenges. Prejudiced beliefs of learners; lack of understanding of advantages and disadvantages of virtual education; Negative experiences of users; technological phobia; wasting time by surfing the internet. These challenges are related to the cultural aspect. So, factor six was labeled as cultural challenges.

Factor seven is composed of the following challenges. Existence of multiple decision centers in using educational technologies in schools. These challenges are related to the legal aspect. So, factor seven was labeled as legal challenges.

Factor eight is composed of the following challenges. Lack of appropriate educational content, lack of appropriate need assessment, lack of educational planning. These challenges are related to the educational planning aspect. So, factor eight was labeled as educational planning challenges.

Table 4 represents portion of each factor from the total common variance. As one may observe that about 70.5 percent of total common variance explained by these 8 factors, which the majority of it has been explained by the technical factor.

Table 4. Factor Analysis of Challenges from Students' Perception

Factor name	Eigen value	Explained common variance by factor
<i>Technical</i>	4.27	21.19
<i>economical</i>	2.23	11.06
<i>services</i>	2.09	10.40
<i>support</i>	1.68	8.33
<i>educational</i>	1.44	7.17
<i>cultural</i>	1.27	5.96
<i>legal</i>	1.20	5.06
<i>educational planning</i>	1.02	1.34

5. Discussion and Conclusion

The following discussion addresses the research findings according to the research objectives. As the factor analysis showed, one may categorize the challenges into five factors, ordered by impacts as legal, technical, educational, economical, and cultural challenges from instructors' perception and technical, economical, services, support, educational, cultural, legal, and educational planning from students' perception. These challenges are not necessarily inevitable, and with careful design, most of them can be overcome. Based on our findings, technical challenges are the most important confirming similar findings by Ho (2002) and Sim & Fresht (2007). Technical problems are always potentially troublesome in the case of synchronous training (video conferencing and virtual meeting), because issues such as sound and video quality can be affected by network traffic. As such, the educational systems should consider selecting methods which do not require high bandwidth, such as asynchronous methods. Based on instructors' perception, the following recommendations can be presented. (1) Enrichment upper level collage's managers in virtual education direction (2) Combining centers where make the ICT's decisions (3) upper level collage's managers should protect, financially and intellectual, instructors who are active in the ICT fields (4) upper level collage's managers should provide computer, printer, and related ICT softwares in the collage (5) Government should legalize the copyright rules to protect educational softwares' creators.

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