

The Faculty's Perception of Web-based Instruction Application in Iran's Higher Education

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Abstract

This paper addresses the faculty perception on web-based instruction in order to explain the nature of learning and instruction in this setting. Using a mixed method approach, the research studied a sample of 132 University Faculty (lecturers and professors) in University of Kurdistan. The research tools were interview and questionnaire. The results of Exploratory Factor Analysis suggested that five basic components could explain the nature of learning and instruction of web-based instruction in higher education: *the lack of authentic learning, autonomy in learning tasks, the weakness of faculty role in instruction, technical skills in web-based instruction and infrastructure and policy-making*. These five components could explicate two more fundamental themes: the overall nature of learning and teaching in web-based instruction and web-based obstacles.

Keywords: virtual education, web-based instruction, educational technology, faculty perception, higher education

1. Introduction

Groff and Mouza (2008) believed "introducing a new technology into the classroom in order to transform teaching and learning has been a long-standing tradition in education" (p. 21). Nworie (2009) stated "in the last decade and a half, there have been rapid changes in higher education resulting from developments in information technology" (p. 24). Nowadays modern universities enjoy paperless environment run as multimedia universities. Such universities are operational with "intelligent building system, wireless technology system, satellite tele-education, a digital library, state-of-the art learning, and research facilities, as well as an integrated computer education management system" (Reaz, Hussain & Khadem, 2007, p. 289).

Web-based instruction (WBI) is one of the main apprehensions related to apply new educational technologies in higher education. WBI is based on epistemic presumptions of constructivism indicating that knowledge is constructed by individuals while working in environment surrounding them (Crotty, 1998, cited in Creswell, 2003). Followers of constructivism believe that knowledge is not constructed outside of the learner's mind but it results from the learner's continuous interaction with, and reflection on existing constructs in order to refine his mental representation and thus to have better understanding of external world: from this perspective learning tasks should be more central than teaching activities in educational settings (Zarei, 2010).

In a formal educational system like university, virtual education allows learner and faculty to have synchronous, asynchronous, distributive and collaborative interaction with each other in internet environment (Yung, Choi, Lim & Leem, 2002). This interaction helps them use different sources of knowledge and regulate their learning according to their needs and capabilities. Therefore, the prominent feature of WBI is that people involving in it, both instructor and learner, interact with each other in different places and times via web based platforms and tools. Virtual education thus has different dimensions in universities and other educational settings. However, in general, application and efficiency of this kind of instruction have been emphasized in learning environments especially in universities. In line with this fact, several studies show that WBI enhances the faculty's professional development, increases our awareness of students' learning orientations and improves interaction skills and learning participation (e.g., Graham, Cagiltay, Craner, Lim & Duffy, 2000; Jung et al., 2002).

Although several research asserted efficiency of WBI in different ways, application of this kind of instruction was not without problem. Among others, teaching and learning barriers to WBI have been considered. Falowo (2007) introduced faculty's problems in WBI such as a need for more time to give feedback, lack of motivation to comply with new instructional conditions and methods in WBI, lack of essential skills and hardware to implement virtual education, need to update technological skills, and concern about losing their official positions. The above mentioned barriers may affect faculty's attitudes directly or indirectly about application and efficiency of WBI. Several studies (i.e., Daugherty & Funke, 1998; Maguire, 2005; Hsu & Chang, 2009; Mobaraki, 2010; Zarei, 2010) show that the faculty's attitudes are positive towards WBI and they enjoy a high internal motivation to participate in WBI. However, they are worried about lack of appropriate standards in virtual courses. These studies also suggest that universities' faculty are concerned about lack of sufficient time to plan and design virtual materials, institutional and organizational support, and academic respect for the faculty's promotion and finally lack of training for enhancing their technical skills. Considering such problems, planning for development of virtual education is still an essential requirement in Iran's higher education, which is on its starting point. Accordingly the present study is to examine the nature of WBI and its executive barriers in Iran's higher education from the faculty's perspective who currently teach in University of Kurdistan. In fact, the implicit purpose of this study is to examine the faculty's tendency, mental and emotional preparation towards WBI because the faculty is one of main pillars to execute and develop WBI in learning environments in university.

2. Methodology

We used a mixed method approach in which quantitative data were more prominent in analyzing and reporting results. Qualitative data were used for basic understanding of research problem, especially for developing questionnaire based on interviews with participants. Such research designs are called "sequential approach" where the data from one phase of the study become a basis for another (Creswell, 2003). Population was the faculty (lecturers and professors) of University of Kurdistan. First, five faculty member were interviewed in order to gain insight into the problem. Second, relying on interviews, we developed a questionnaire and administrated it in the university among all faculties. Table 1 shows distribution of participants:

Table 1. Distribution of participants according to Faculty or Departments

	Frequency	Percentage
Literature and Human Sciences	43	32.6
Science	30	22.7
Agriculture	25	18.9
Natural Resources	16	12.1
Technical and Engineering	18	13.6
Total	132	100

The first tool for collecting data was semi-structured interview in which there were some open-ended questions. The general theme of questions was same in all interviews however; the probing questions were asked to conceive interviewees' answers deeply. The theme of questions was based on previous research and according to research objectives. Based on deductive approach, interviews were analyzed. In other words, the research questions were considered as a deductive framework and then the interviews were analyzed in terms of the research questions. Two general themes including several categories were developed in the qualitative data: the nature of learning and teaching in WBI, and challenges and barriers to WBI. The second tool was the questionnaire developed based on the interviews consisting of 20 items. The items of questionnaire were designed in such a way that could address two themes explored in qualitative data analysis. Cronbach α calculated for questionnaire was 71.6% and it showed a fair reliability. Confirmatory Factor Analysis (CFA) showed extraction of five factors. Goodness of fit was measured for obtained factors. It showed that model enjoyed appropriate goodness for considered items in questionnaire (see detailed information in section of results).

3. Results

3.1 Dimensions of WBI from the Faculty's Perspective

The purpose of this study was to explore fundamental dimensions of learning and instruction related to WBI in Iran's higher education from the University of Kurdistan faculty's perspective. In the first phase, we tried to gain a big qualitative picture of more general dimensions based on the interviews conducted with some participating faculty. Analyzing the interview data revealed the following categories:

- Emotional relationship between learner and faculty in WBI
- Time-consuming process of WBI for designing a course
- The quality of students' learning in WBI
- The students and faculty's skills for effective use of WBI
- The necessary university's infrastructure and policy for providing and developing effective WBI.

In the second phase (i.e., quantitative analysis) Exploratory Factor Analysis was conducted on data collected with questionnaire to know if obtained factors -in qualitative process- were confirmed. Bartlett Test of Sphericity and KMO were done to understand whether correlation between variables (items of questionnaire) was significant to measure extracted factors. Bartlett Test of Sphericity showed that there was significant correlation between items of questionnaire to measure considered factors (596.26, $p < 0.0001$). Therefore, null hypothesis was rejected for correlation matrix to be same. Moreover, KMO justified calculation of factor analysis (0.733).

Data were analyzed by Maximum likelihood analysis and Varimax Rotation method to extract the number of considered factors based on collected questionnaires. Results showed six factors were identified based on Eigenvalue; Eigenvalue was more than 1. Therefore, they could be extracted. But, Goodness of fit test resulted from Chi Square showed that data did not provide 6 resultant factors appropriately. Thus ScreeTest was used and it reduced 6 factors to 5. Then, Goodness of fit test resulted from Chi Square demonstrated that data provided 5 resultant factors appropriately; (χ^2 : df, 100=97.60, $p=0.54$). This model explained 52.65% out of total variance. Moreover, two items (17, 20) had no suitable factor loading and three items (2, 11, and 19) had cross load over factors, thus they were not considered in further data analysis. Finally, factors were named based on logical and conceptual relationship (content validity) between items, face validity and results of qualitative: "the lack of authentic learning" (20.92% out of total model variance), "self-regulative learning" (9.72%), "poor controlling role of faculty" (9.101%); these three factors altogether were clustered into a more fundamental theme called "quality of learning and teaching in WBI". The other two factors were "technical skill of WBI" (7.26%), "infrastructure and policy making" (5.64%) that were basis for a theme called "barriers to WBI development".

3.1.1 Quality of Teaching and Learning in WBI

With computing the items related to theme quality of teaching and learning in WBI (i.e., items related to factors "the lack of authentic learning", "self-regulative learning", "poor controlling role of faculty") two sub-scales were measured: "challenging nature of teaching and learning in WBI" and "facilitating nature of learning and teaching in WBI". In general, results showed that 56.8% faculty saw teaching and learning in WBI as a challenging phenomenon. In other words, they believed that the WBI was more challenging than facilitating in Iran's higher education. However, such differences were not statistically significant.

For more understanding, relationship of two above mentioned sub-scales were examined with some mediating variables such as the faculty's field of study, age, and the amount of internet use. Considering the field of study, the faculty who taught in the field of agriculture devoted the most (64%), while those who were in the fields related to literature and human sciences allocated the least (36.7%) percentage in terms of perceiving WBI as challenging nature in higher education. Moreover, most of the faculty in departments of engineering, science and natural resources believed that WBI was more challenging than facilitating in Iran's Higher education. However, these differences were not statistically significant. Table 2 demonstrates these differences:

Table 2. Distribution of the perceived quality of learning and teaching in WBI and field of study

Scale	Challenging nature		Facilitating nature		Total	
	frequency	Percent	frequency	Percent	frequency	percent
Field of study						
Literature & Human Science	21	48.8	22	51.2	43	100
Science	19	63.3	11	36.7	30	100
Agriculture	16	64	9	36	25	100
Natural Resources	9	56.2	7	43.8	16	100
Engineering	10	55.6	8	44.4	18	100
Total	75	56.8	57	43.2	132	100

$$\chi^2(\text{df},4) = 2.17, \rho = 0.74$$

Considering amount of internet use, results showed that most faculty (65.4%) who had less internet use considered WBI as a challenging issue in higher education but, most faculty who had high or average internet use identified WBI as facilitating tool. Table 3 indicates the results:

Table 3. Distribution levels of internet use and quality of learning and teaching in WBI

Scale	Challenging Nature		Facilitating Nature		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Internet use levels						
Low use	51	65.4	27	34.6	78	100
Average use	19	44.2	24	55.8	43	100
High use	5	45.5	6	54.5	11	100
Total	75	56.8	57	43.2	132	100

$$\chi^2(\text{df},2) = 5.7, \rho = 0.05$$

About age, data analysis showed that there was no significant difference between experienced and young faculty's attitudes about the quality of teaching and learning in WBI.

3.1.2 Barriers to WBI in Higher Education

In this sector, purpose of data analysis was to determine the magnitude of mentioned barriers to develop WBI in higher education. Like the previous theme, with computing the items related to theme "barriers to WBI" (i.e., items related to its two factors "technical skill of WBI", "infrastructure and policy making"), we measured two sub-scales: "significant barriers" and "minor barriers". Results showed that most participating faculty (56.1%)

believed that the existing barriers for developing WBI in higher education were minor. In order to measure the effects of mediating variables, relationship between the field of study and barriers was examined. Most of faculty in departments related to fields of science and natural resources stated that the level of barriers for developing WBI was significant in higher education. Table 4 indicates more details:

Table 4. Distribution of field of study and level of development barriers to WBI

Scale	significant barriers		minor barriers		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Literature and Humanity Science	15	34.9	28	65.1	43	100
Science	22	73.3	8	26.7	30	100
Agriculture	8	32	17	68	25	100
Natural Resources	9	56.3	7	43.7	16	100
Engineering	4	22.2	14	77.8	18	100
Total	58	43.9	74	56.1	132	100

$$\chi^2(df,4) = 17.83, p = 0.01$$

Other variables (age and amount of internet use) were not significantly associated with faculty's perception on level of barriers in higher education for developing WBI.

4. Conclusion and Discussion

Relying on interviews, results of factor analysis showed that faculty determined five fundamental factors in terms of application WBI in Iran's higher education; lack of authentic learning, self-regulating learning, and faculty's controlling role, technical skill of WBI and infrastructure and policy making. The first three components indicated a basic theme called quality of learning and teaching in WBI. Furthermore, two other components clustered into another central theme called barriers to WBI development (figure 1). The overall results showed that most of the faculty perceived the quality of WBI as challenging than facilitating, even though the difference was not statistically significant. Regarding to the barriers to WBI in higher education, most of the faculty perceived the level of barriers as minor. Considering the association between the mediating variables with both themes, as it can be seen in the figure 1, there was a significant difference between levels of internet use by faculty in terms of quality of teaching and learning in WBI: the faculty with high level of using internet, perceived WBI less challenging. Also, there was a statistically significant difference among various fields of study in regarding to barriers to WBI development. Other variables showed no significant association with two basic themes.

Like several other research (Daugherty & Funke, 1998; Maguire, 2005), this research shows that development of valid and authentic learning in virtual education is a challenge based on faculty's attitudes. Moreover, faculty believes that they are not able to play their role well to control class and students' learning. From one hand, this attitude results from epistemic presumptions of positivism dominating Iran's higher education and on the other hand, faculty adheres to traditional theories of learning (e.g., behaviorism). Based on these presumptions and theories, an authentic knowledge can be acquired with scientific methods, and such knowledge may be found in existing academic textbooks and resources, thus they should be presented face to face by faculty –in order to being able to control class and students' learning. In other words, good knowing and knowledge can be constructed out of learners' mind, therefore; external factors especially teacher is prominent to determine the significant and reliability learning. Another reason that faculty failed to perceive knowledge as authentic in WBI is to hold a praiseworthy attitude towards science and knowledge. Concerning this attitude, good knowledge has

been already produced by scientists and scientific methods. University and higher education institutions should preserve structure of science and its production (Balard, 1991; cited in Zarei, 2010).

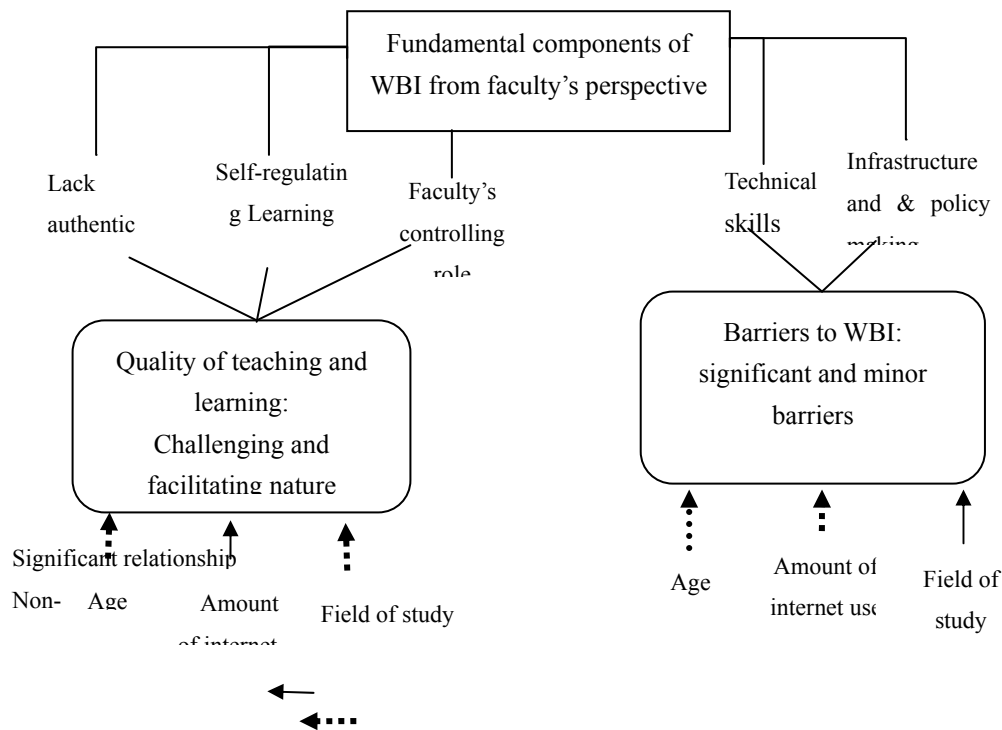


Figure 1. Conceptual framework of virtual education based on faculty's attitudes

Perceiving WBI as challenging, the faculty however believed that WBI is crucial to provide an environment in which students can regulate their learning. Other research (e.g., Bullen, 1999; Keengwe et al., 2009; Mobaraki, 2010) also demonstrates that WBI is an effective approach to develop learning, enrich learning environment and help students to concentrate more on learning task and regulate it based on their own condition and interests. These findings indicate that virtual education like other professional and technological phenomenon has positive and effective properties to develop educational condition in spite of some challenges. A meta-analysis shows that the faculty sometimes conflict in their attitudes towards WBI because WBI is quite new to Iran's universities such as university of Kurdistan. Moreover, since there are not appropriate facilities and infrastructures for conducting WBI, it causes confliction in the faculty's attitudes toward WBI. The findings suggested that most of the faculty consider the lack of policy making and poor infrastructures as basic barriers to develop virtual education. The lack of faculty's and students' technical skills was the other significant barrier and challenge in Iran's virtual education. These barriers have also been mentioned in other research (e.g., Daugherty & Funke, 1998; Zarei, 2010).

It is considerable that regardless of the field of study and departments in University of Kurdistan, most of the faculty stated that WBI can be a facilitating tool for teaching and learning in Iran's higher education. It confirms that faculty's general attitude towards virtual education and its application is positive. Therefore, findings indicated there was a general positive attitude toward application of virtual education in university of Kurdistan. But, it requires more research to know which model of virtual education fits conditions and facilities in this university.

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Appendix

Items of questionnaire used in this study, in the quantitative stage

1. I think students are sufficiently skillful to use internet in their courses.
2. Face to face teaching is better than internet and virtual space to teach in our field.
3. As far as I know, University of Kurdistan has made no policy to develop virtual education.
4. I cannot control the quality of students' learning in internet environment.
5. I cannot play my role effectively as a faculty while I am conducting a course in WBI
6. There is no appropriate infrastructure (e.g., high speed internet and computer) for virtual education in this university.
7. I am not taught for internet education.
8. It is an important advantage not to attend class while teaching through Web.

9. I think most of students (I know) fail to complete their learning tasks in WBI.
10. There are no emotional and affective relationship between faculty and students in WBI.
11. It is important that faculty and students can access learning material regardless of time and space.
12. I believe that students enjoy more opportunity to participate in learning activities in virtual space.
13. In a virtual course, students are more autonomous to regulate their learning pace.
14. It may be the case that in WBI some students fail to learn authentically.
15. Faculty has no enough time to answer all students' problems raised through an internet course.
16. It is not possible to exactly evaluate students' performance in virtual environment.
17. Designing lesson in virtual education is easier than face to face education.
18. Essential training and workshop and are not held to improve internet skills in this university.
19. I am not interested in using internet to teach.
20. I feel that students' internet skills are general than technical for using WBI.