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Research Report

What motivates high school teachers to use web-based learning resources for classroom instruction? An exploratory case study in an Iranian smart school

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ABSTRACT

This exploratory case study reports on the findings of Persian teachers' motivation and use of Farsi-Web-based Learning Resources (FWBLRs) in classroom instruction. Data were inductively gathered from ten teachers' and five students' use experiences of FWBLRs in the context of a smart school in Tehran, Iran. Focus groups and face-to-face semi-structured interviews, repeated in several rounds, were used for data collection. Thematic analysis elaborate on the teachers' perceived pedagogical usability of FWBLRs. Five main motivations of pedagogical usability emerged from the findings: (a) desirability; (b) content accessibility; (c) student-centred teaching support; (d) multimedia interactivity; and (e) feasible classroom instruction via simulation. The study suggests that the effective use of Web-based Learning Resources (WBLRs) would require some considerations, including the use context and corresponding educational policies. This can be of value to the researchers in the field as well as stakeholders of WBLRs. In practice, this can support the development of effective and fun teaching–learning environments.

1. Introduction

Due to the increased tendency toward learners' digital literacy, Web-based Learning Resources (WBLRs) as pedagogical tools are becoming increasingly important in classroom instruction. Previous research reveal that K-12 learners' information use and behavior have changed from searching for, and using, traditional resources to web resources (Berger, 2010; Murphy & Lebans, 2008; Rahimi, Den Berg, & Veen, 2012; Sadaf, Newby, & Ertmer, 2012). Teachers are encouraged to use WBLRs and social media in order to capture their students' motivation as well as to improve the latter's learning retention (Drigas, Ioannidou, Kokkalia, & Lytras, 2014; Kay, Knaack, & Petrarca, 2009; Light & Polin, 2010; Silius, Kailanto, & Tervakari, 2011), and teachers believe by doing so would enable them to conduct student-centred learning more effectively (Abrizah & Zainab, 2011; Bland, Sabatino, Sedlak, & Sternberg, 1979; Kay et al., 2009; Light & Polin, 2010; Prestridge, 2012; Recker, Dorward, & Nelson, 2004; Silius et al., 2011; Wu, Chen, & Hsieh, 2005).

The use of web-based technology in classroom instruction has been identified as the top priority in Iran and deliberate efforts have been made to ensure that WBLRs are embedded into wider professional teaching practice. However, Iranian teachers' experience with the in-school use of web-technology may be less positive and remains a big challenge (Afshari, Bakar, Luan, Samah, & Fooi, 2009; Hosaini Farhangi, 2006; Moradi & Khalkhali, 2008; Najafi, 2006; Shahbaz, Nasr Esfahani, & Zamani, 2007). What constitutes the challenges in infusion and instruction of ICT in schools and the role teachers should play in the provision of teaching and learning with web-based technologies, however, has only started to be explored in the last few years in Iran. Iranian teachers' lacks of technological skills in integrating optimal use of ICT into the curriculum have been reported as the main reason for this challenge (Attaran, Alias, & Siraj, 2012; IzadiYazdanabadi & Mirzaee, 2011). Studies have reported that the teachers experienced insufficient technical supports at school and limited access to the Internet (Salehi & Salehi, 2012), lacked of pedagogical instruction to facilitate students conduct on Internet searches (Fatahi, Dokhtesmati, & Saberi, 2011), and lack of positive attitude toward teaching in smart schools (Attaran & Siraj,

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2010). However, little is known as to whether inaccessibility and disconnectivity to the Internet, and the presence of censorship and filtering systems of Internet sites by the Iranian government have contributed to this challenge. There have been no studies that delve further into the features of WBLRs that would intensify Iranian teachers' motivation to use such resources in their classroom instruction, and no definite answer about how positive and engaging uses of the Web are carried out, considering the large and varied range of context found in classrooms. Apparently, the Web does not support learning process as a course in the landscape of Iranian K-12 education. As such, educators may not use web resources in their curriculum unless they perceive them as useful tools in terms of meeting their professional information needs.

The use of web resources in education can be influenced by the quality of the information (Casteleyn, Daniel, Dologand, & Matera, 2009) from the user's perception (Klobas, 1995). Our previous research (Mohammadi, Abrizah, & Nazari, 2015) which focused on the concept of information quality which emphasizes on "information fitness for use" (Wang & Strong, 1996), deliberates on the desirable information quality dimensions of WBLRs required by Iranian teachers, which might be critical in terms of the usage of web resources in the Iranian school context. It is important to take consideration the user's (or consumer's) viewpoint of the quality of information because ultimately the user will decide whether he or she will use the information. Within this context, this paper reports on an exploratory case study of Iranian teachers' motivation to use WBLRs in Iranian smart schools using the concept of information quality as the theoretical lens. The Iranian or Farsi teachers involved in this study are the information consumers and decision makers who will determine whether a web resource is fit for use, which may represent the information quality of the resource. It is important to understand Iranian teachers' perceived pedagogical usability in the context of Farsi Web-based Learning Resources (FWBLRs) for instructional use. Therefore, the main goal of this study is to explore what makes web-based technology use more effective in Iranian classroom instruction.

2. Literature review

A growing number of studies have shown that today's students are expected to use a variety of learning technologies in order to succeed in secondary education. They need equal access and satisfying learning in the new digital environment, including the development of new technology tools and self-regulation of attention while working with the online information. Drigas et al. (2014) who reviewed the literature of the representative researches on ICTs, mobile learning and social media application to enhance learning for attention difficulties in various educational settings, disclosed that there is the general agreement that ICT, mobile learning and social media is not only promising technologies but an existing variety of tools to enhance learning. The authors have emphasized the necessity of providing research findings in the application of new technology and social media in order to meet the specific information needs in the field of educational development. McGough and Salomon (2014) wrote that the use of web-based technology especially social media is second nature to students, and schools can secure their place in the academic life of the institution by using these tools and platforms to engage students in relevant ways. Boticki, Baksa, Seow, and Looi (2015) reported that mobile learning engages students in self-directed and collaborative activities and provides a participatory platform for students to actively contribute, share, and give feedback on their learning experiences individually.

Integrating technologies into teaching and learning is seen by many educators as affording opportunities to shift from teacher-centred to student-centred learning (Moyle, 2008). Most educational researchers agreed that one important variable in the effective technology implementation and effectiveness is the quality of the teacher knowledge of effective technology uses in instruction (Mulford, 2008). Students value high quality teachers who form positive relationships with students and construct relevant and engaging learning contexts with technologies (Moyle & Owen, 2009). Furthermore, recent research suggests that teachers develop a basic understanding of their students' readiness, interest, and learning profile before adopting and adapting the pedagogical principles when teaching with technology, based on differentiation of these four dimensions (Hobgood & Ormsby, 2011): (a) content, i.e. locating and augmenting content; (b) process, i.e. attending to the student-dependent dimension of differentiation, such as student readiness, student interest, and student learning profile; (c) products, i.e. offering options for how students will express their understanding of the target learning goals and objectives; and (d) environment, i.e. the physical space where learning takes place and all the elements within that space that have an impact on student learning. Tess (2013) who summarized the findings of empirical investigations concerning the utility and effectiveness of social media in education settings revealed that although the infrastructure to support social media's presence exists in most institutions today, educators have been slow in adopting the tool as an educational one. The adoptive educators are likely in an experimental stage of implementation as they look for alignment between course activities and the social media applications. Tess (2013) concluded that gaining social media facilities in education require to recruit expert educators who know how to integrate social media in their curriculum effectively.

The evidence reviewed here indicates that the choices teachers make about the technologies they deploy are reflections of the skills, pedagogical values and philosophies that they endorse. It requires the teachers to rethink the resources made available to their students, the curriculum and assessment approaches and a consideration of these constructs in light of collaborative, rather than simply individualistic points of view. It also requires them to reflect upon their roles and capabilities, to revisit their expectations and understandings of learning in light of the educational possibilities now afforded by WBLRs canvassed in social media, mobile learning's and complex software – such as online games and simulations – and to move on from simply expecting students to use word processing software for the presentation of assignments.

3. Method

The study aims to illuminate motivational dimensions of web-based resources in the context of some actual teaching and learning experiences in the actual setting of a smart school in Iran. Employing a case study as the research method, it attempts to answer the following research question: ***What motivates the Iranian high school teachers using web-based learning resources for their classroom instruction?***

A case study is known as a research strategy which allows the employment of multiple research methods and different types of data sources. It is an appropriate methodology when the study aims to explore a contemporary phenomenon or a few issues in some natural settings (Eisenhardt, 1989; Pickard, 2007; Yin, 1994). Smart schools were selected as the use context of this research because there are only a small number of educational centres in Iran which are engaged in using web-based learning resources for education effectively. Surfing the web and questioning the number of school teachers and faculty members in Iran, revealed that among these centres, smart schools might be the best case which could answer the corresponding research questions.

This is due to smart schools have been initiated to employ new technology in education exclusively (Jalali, 2011). Data was gathered from two main sources of evidence which each contributed to the research design and understanding of the phenomenon in this study (Table 1).

(a) Teachers' perceptions and use experiences of Farsi WBLRs.
(b) Students' experiences of assisting teachers in the WBLR use experiences.

Data collection process for this research has been gathered during two steps. Firstly, two focus group interviews with ten teachers who are teaching different subjects in the smart high schools in Iran. This was followed by one-to-one semi-structured interviews with five of them seeking deeper insights of the study. Broader perspectives were brought to the study by interviewing five students who assisted the teachers in the process of collection and use of FWBLRs (and suggested by the teachers as informants in the study). Thematic analysis approach was used for the analysis of the data.

The aim of focus group interviews was to obtain basic information related to the phenomenon undertaken by the study participants and to identify the key informants who could participate in subsequent one-to-one interviews, in the next step.

Semi-structured group interviews were conducted on January 21st and 22nd, 2012 recruiting ten (10) Iranian smart high school teachers. The interview session for each group lasted about 3 h. Each participating group comprised five (5) smart school teachers who teach mathematics, chemistry, biology, Farsi literature, and Physics. From the overall seven subjects that were taught in the target School, two, including Arabic language and English language, were excluded from the study, as the focus of the study was on the web-based information resources in Farsi language. The teachers' average teaching experience was 20 years, and they had, at least five years experience in using web resources. All of them were females. Table 2 represents the demographic information of the participants in the focus groups. The teacher participants were purposively sampled based on following criteria and they were introduced to the researcher by the school administrator:

(a) They have at least 5 years of experience in using web-based resources.
(b) They have interest to apply web resources for classroom activities.
(c) They teach in the following fields; chemistry, physics, mathematics, biology, and Farsi literature.

As the second step, among ten (10) teachers who participated in the focus group interviews, five (5) participants were recruited for face-to-face interviews. Comparing pair of teachers in the same discipline within each group, the researcher selected one volunteer from each discipline who was more interested to participate in the subsequent one-to-one interview. The sample was kept small because of the exploratory nature of the study and the researcher used semi-structured interviews with the teacher participants. Table 3 indicates demographic profile of the one to one teachers' participants. The schedule of interview sessions is indicated in Table 4.

The purposive sampling which has been used in this study allowed the researcher to explore various aspects of problems and solutions from the perspectives of the teachers from various subject domains. It is in line with the Miles and Huberman (1994) who suggest that multi-case sampling improves the precision, validity, and stability of findings.

Table 3
Teacher participants' profile of the one-to-one interviews.

Participants	School subjects	Academic qualification	Years of teaching experience
Mathematics	Mathematics	Masters degree	19 years
Physics	Physics	Masters degree	23 years
Chemistry	Chemistry	Bachelor degree	22 years
Farsi literature	Farsi literature	Bachelor degree	16 years
Biology	Biology	Bachelor degree	25 years

Table 1
Contribution of multiple methods/evidence to the research design and contextual understanding of the phenomenon (adopted from Nazari, 2010: 185).

Evidence	Method	Contribution
Teachers' collective perceptions and experiences of WBLR	Teachers' focus group interviews	General understanding of the basic issues related to the use of WBLRS in smart schools Selection and recruitment of the key informants for the second phase of the study
Teachers' individual perceptions and experiences of WBLR	Teachers' face-to- face interviews	Deep insight into the key issues related to the use of FWBLRS in smart schools
Students' teaching assistant experiences of WBLR	Students' face-to- face interviews	Broader perspectives on the use of FWBLRs (complementary data source to the emergent patterns from teachers' use experiences)

Table 2
Demographic information of the focus group participants.

Participants	School subjects	Academic qualification	Years of teaching experience
Group 1 – January 21st 2012 (9.30–12.30) a.m.			
TFG1-mathematics	Mathematics	Masters degree	19 years
TFG1-Physics	Physics	Bachelor degree	20 years
TFG1-Chemistry	Chemistry	Bachelor degree	22 years
TFG1-Farsi literature	Farsi literature	Masters degree	13 years
TFG1-Biology	Biology	Bachelor degree	25 years
Group 2 – January 22nd 2012 (9.30–12.30) a.m.			
TFG2-Mathematics	Mathematics	Bachelor degree	18 years
TFG2-Physics	Physics	Masters degree	23 years
TFG2-Chemistry	Chemistry	Bachelor degree	27 years
TFG2-Farsi literature	Farsi literature	Bachelor degree	16 years
TFG2-Biology	Biology	Bachelor degree	20 years

Table 4
Frequency, date, and duration of interviews with the teachers.

Teacher participants	Frequency of interviews	Date of interviews	Total interview time (min)
Biology	4	(20 February, 26 April, 10 June, 10 September)	360
Chemistry	5	(25 February, 26 April, 16 June, 20 August, 10 September)	450
Physics	6	(25 February, 19 April, 12 June, 20 August, 29 August, 10 September)	540
Farsi Literature	4	(20 February, 21 April, 12 June, 12 September)	360
Mathematics	4	(20 February, 21 April, 10 June, 12 September)	360

Table 5
Frequency, date and duration of interviews with students.

Student participants	Frequency of interviews	Date of interviews	Total interview time (min)
Student A	6	(28 February, 26 April, 16 June, 10 July, 20 August, 15 September)	540
Student B	3	(28 February, 26 April, 23 August)	270
Student C	4	(29 February, 26 April, 23 August, 10 September)	360
Student D	5	(20 February, 28 March, 23 August, 29 August, 10 September)	450
Student E	5	(29 February, 26 April, 123 August, 10 September, 12 September)	450

One- to- one interview sessions were conducted from February 2012 to September 2012. During this period, discussions between participants and researcher were extended as each participant was interviewed 3–6 times. The iterative interview sessions helped the researcher to deepen her understanding of the participants' perceptions of the phenomenon, and provided her with a rich pool of data. All interviews were tape (audio) recorded.

To increase the depth of understanding obtained from the phenomenon under study, one-to-one interviews with five students were also conducted as an additional data source. The students' interviews were conducted to help triangulate and provide additional information that might be missed by the teacher participants related to the use of web resources.

Each of the student participants of the current research was introduced by the teachers as their assistants, who have collaborated with them to produce customized electronic contents for classroom teaching. The students were interviewed 3–6 times to explore further on issues related to unclear situations. In summary, these students shared their experiences in using the FWBLRs. Table 5 represents the frequency, date and duration of interviews with the students.

4. Data analysis

Glaser and Strauss' (1967) strategy has been used for analyzing the interview data. Data analysis of the current research was accomplished through the following three steps: (a) Transcribing; (b) Data coding; and (c) Memo writing, translating and inter-coder checking.

As the first step of data analysis process, the qualitative verbal data recorded from all participants were transcribed in the native Farsi language (Persian). Then, to ensure that the transcriptions successfully conveyed the participants' views (Marshal & Rossman, 1995), the transcriptions were sent to the interviewees to confirm the accuracy of their own statements. Lincoln and Guba (1985) described this act as "the most crucial technique for establishing credibility" (p. 314) in a study.

After obtaining the participants' confirmation, the researcher undertook coding process. The data coding was carried out from the beginning stage of the data collection process. Align with Glaser and Strauss's coding strategy (1967), the data coding for this research was undertaken in two steps. The first step involved performing an open coding process, whereby the researcher tried to provide the maximum number of substantive codes by using the words provided by the participants. In order to obtain a rich pool of initial codes, data analysis and data collection were carried out simultaneously. Focusing on the four major themes of the study, including why participants use, what problems were encountered, what quality control criteria were applied and how web resources were evaluated, provided the researcher with the constant flow of data for analysis. All interviews were studied frequently and analyzed concurrently, and all transcripts were coded collectively. This task supplied the researcher with a large number of codes identified through the scrutiny of various opinions of the participants.

The second step of coding data focused on the coding process. Similar codes were compared, and merged frequently, providing new codes, which could explain or interpret best of the phenomenon. When the last selective codes emerged and translated into the English language, together with related memos were sent to inter-coder for reliability checking. This iterative process concerning coding, memo writing and translating was performed concurrently in such a way that single codes were compared, and focus codes emerged. The focus codes were modified and translated into English along with their related memos, which were sent to inter-coder in order to obtain her agreement. This procedure was continuously carried out as long as new codes emerged.

The final part of data analysis procedure involved memo writing and it was concurrently carried out with the second step of the coding process, which included developing selective/focused codes. The concurrent development of selective codes and writing memos for those codes provided an opportunity for the researcher to bring together similar ideas that emerged from the various transcripts. Memo writing process comprised two steps involving writing and sorting of memos. Firstly, the researcher added her interpretations for each code or category. The codes that emerged were supported by the participants' statements. Then giving the codes titles, and locating some of the similar memos under a single relevant code helped the researcher to accelerate the next step, in which all memos under a single title were sorted and used in writing the narrations collectively. Inter-coder who was expert in the English language and qualitative research checked all codes, related memos and quotes to ensure reliability. After obtaining inter-coder agreement, the final codes and memos emerged.

5. Findings

This section attempts to answer the research question addressing the teachers' motivation to use FWBLRs for classroom instruction. Findings indicate that the smart school teachers were in general motivated to use FWBLRs because they believed that technology infusion in the classroom setting could help improve their own teaching, increase students' engagement and accelerate learning. When the interview and focus group data were analyzed, their motivations to use FWBLRs were captured in two main themes comprising, (a) the delivery of instructional materials; and (b) the development of instructional materials. This paper reports on

Table 6
Teachers' motivations in using FWBLRs to deliver instructional materials.

Motivational themes	Descriptions
Desirability	Students' eagerness in using web resources Language familiarity Social acceptance
Content accessibility	Quick and Free of Charge Access Multi-user accessibility of FWBLRs; Contents of FWBLRs are available or retrievable easily and quickly
Student-centred teaching support	FWBLRs support teaching by focusing on students' interests, abilities and learning styles
Multimedia interactivity support	The audio-visual attributes of multimedia FWBLRs as stimulus to accelerate students' understanding of subject matter
Make feasible classroom instruction via simulation	FWBLRs support the capability to carry out an educational activity practically and effectively

the findings of the first theme namely "delivery of instructional materials".

Table 6 represents the motivational reasons given by the participants related to the delivery of FWBLRs. It indicates that the teachers were motivated to use FWBLRS in the delivery of instructional materials due to their (a) desirability, (b) content accessibility, (c) student-centred teaching support, (d) support for multimedia interactivity and (e) making feasible classroom instruction via simulation.

Following section describes each of the themes and related sub-themes associated with "delivery of instructional materials".

5.1. Desirability

In this study, desirability refers to associating FWBLRs with worth, having or seeking to be used for classroom instruction. Teachers saw FWBLRs as useful and pleasing. Various reasons affected the teachers' decision-making to use web-based learning resources in teaching and learning. The results indicated that the desirability of FWBLRs was considered as an important feature of FWBLRs, which provided an opportunity for teachers to deliver instructional materials within educational context. Three main reasons emerged from the interviews related to desirability features, which included (a) students' eagerness in using web resources; (b) teachers' and students' familiarity with Farsi language; and (c) gaining social acceptance.

(a) Students' eagerness in using web resources

Regarding students' eagerness in terms of applying web resources, the teachers were motivated to use web resources for the simple reason that their students were versatile in using the Internet. They felt that they needed to use it in order to keep themselves updated along with their students' interests and improve rapport with their students. A teacher indicated her opinion as follows,

> "*To be updated and to get along with my students are my major reason for using the web resources. Because of students' familiarity with "Face book" or "Google reader" it reminds me that I should know about these web services like my students. Using the Internet helps me achieve this goal easily*".
>
> [Mathematics, Interview, 20 February 2012]

Likewise another teacher noted,

> "*Students use web resources more than we (teachers) do, they love the Internet so much. They surf the Net, and come across different materials that we are not familiar with. We need to know what are the materials we can actually use [to teach] using web resources*".
>
> [Biology, Interview, 20 February 2012]

One teacher compared the teachers with the students, highlighted that their students belong to the Net generation and gave the following comments,

> "*When four out of five students want to use the Internet for lessons, as teachers we need to tag along. They belong to the Net generation, they surf the Web around 6 h a day, to study, to play... while we teachers use it for only a little time for this reason*".
>
> [Farsi literature, Interview, 20 February 2012]

The same teacher continues,

> "*The students are keen users of the computer, and are so used to it but for me I have to force myself [to use the computer]... I am forced to use it to fulfil my teaching responsibility*".
>
> [Farsi literature, Interview, 20 February 2012]

Similarly, the Mathematics teacher remarked,

> "*You want to have a good relationship with your students, keep yourself updated! Our students are updated. They are more enthusiastic to use new technology such as the Web than their teachers, although they usually use the Web for entertainment*".
>
> [Mathematics, Interview, 21 April 2012]

(b) Language familiarity

The medium of instruction for the five subjects taught by the teachers in this study is Farsi, and it is expected that the teachers and students in the selected smart school are accustomed to the Farsi language than other languages such as English and Arabic. The participants in this study indicated that they are more competent in using contents in the Farsi language rather than in the English Language. The chemistry teacher illustrated this in the following verbatim statement,

> "*I'm not good in English language, and usually, I cannot understand English texts well. But I can understand the Farsi texts in such a way that I can even remember the page number of a particular paragraph in a book that I have read*".
>
> [Chemistry, Interview, 16 June 2012]

Similarly, addressing students' weakness in comprehending English texts, another teacher stated,

> "*My students are not good in English, so I prefer to use Farsi web resources. Understanding the Farsi contents is more convenient for them compared to English, they are more comfortable with Farsi contents*".
>
> [Physics, Interview, 25 February 2012]

(c) Social acceptance

The teacher participants of the current study believed that using the Web enabled them to be considered as valued, supported and respected teacher from their students' perspective. The teachers felt they can benefit from maintaining friendly relationship with their students to increase their willingness to cooperate in the classroom learning. One of the participants disclosed this belief in the following statement,

> "*When students talk about web technology and I join them, it surprises them because they see me as a web user, just like themselves.*

This improves relationship between us, and encourages my students to follow classroom discussion actively".

[Mathematics, Interview, 10 June 2012]

5.2. Content accessibility

In this study, content accessibility is the extent to which the contents of FWBLRs are available or retrievable easily and quickly. It seems that the effortless access to the FWBLRs would influence the effective use of such resources. The participants of the current research believed that there are various types of FWBLRs that could be obtained from the web easily and quickly. The following sections present some of the issues related to perceived content accessibility features of FWBLRs which encouraged teachers and students of Iranian smart schools to use such resources.

(a) Quick and free of charge access

One participant voiced his opinion about the importance of using web-based technology to provide suitable access to digital learning resources,

"Internet and the Web provide us with an excellent opportunity to gain full access to rare and inaccessible books".

[Farsi literature, Interview, 21 March 2012]

Furthermore, easy access to numerous free of charge reference books, was considered as an advantage of using Farsi web resources by participants. The following statement confirmed the popularity and cost effectiveness of web-based information resources,

"*The Web offers tremendous advantages as it saves cost. For example, it enables students to download and use so many expensive reference books such as the "Moein dictionary", free of charge*".

[Farsi literature, Interview, 21 March 2012]

Similarly, related to the importance of access to free web resources, one of the participants in the focus group commented as follows,

"*There are so many valuable books on the web that you can obtain free of charge. For me, this is an excellent feature which encourages everyone to use web-based materials*".

[Biology, FG1, 21 January 2012]

(b) Multi-user accessibility of FWBLRs

In addition to financial benefits from using free of charge web resources, the multi-users feature of web resources was also applauded by the participants of this research. Interview with teachers revealed that unlike single-users printed materials, multi-users web resources provided equal opportunity for everyone to access information resources simultaneously. One of the participants declared as follows,

"*I like the idea that web-based information resources can be read by multiple users at the same time. Whereas, if you seek the printed information resources in a library, you may not find what you need*".

[Chemistry, Interview, 20 August 2012]

According to the participants, in some instances, teachers were encouraged to use easily accessible web resources as opposed to printed source to deal with time constraints associated with classroom teaching. One of the participants commented as follows on this matter,

"*Sometimes we need additional information resources as supplementary sources for text books. Issues related to limited physical accessibility of printed books and time limitation on one hand, and our instant information needs on the other hand, led us to use web-based learning resources*".

[Biology, Interview, 26 April 2012]

5.3. Student-centred teaching

In this study, student-centred teaching is defined as teaching that focus on students' interests, abilities and learning styles. The teachers indicated that they follow their students' interests and skills to provide quick and enjoyable learning. The teachers revealed that they used FWBLRs in classroom teaching for two reasons. The first reason is that the teachers considered students as web users who were interested in interacting with the Web to promote their knowledge using web resources. The teachers believed that the new generation of students would pay more attention to web-based instructional materials and Internet services than to their teachers.

According to the teachers, students surf the web and used web-based services and resources more than their teachers. This issue led the teachers to incorporate web resources in students' instruction. The teachers believed that in comparison with traditional resources, using web resources would increase students' motivation to learn quickly and effectively. This belief is reflected in the following statement from a teacher participant,

"*Students like web resources so much. They belong to the net generation who surfs the web around 6 h a day, whereas we teachers use it only for a little time. So, this has encouraged us to use web-based resources to fulfil the educational aims effectively*".

[Farsi literature, Interview, 12 June 2012]

5.4. Multimedia interactivity

Providing convenient exchange of educational concepts between teacher and learner might be considered as desirable feature of web information resources. This exchange could be achieved with human's multiple senses. The results of this research revealed that audio-visual stimulus provided by multimedia resources were appreciated by the users of web resources. This is because such resources provided pleasant opportunity of utilizing multiple human senses, in which learners could learn quickly.

A biology teacher explained the significance of multimedia facility in enhancing the learning outcome, compared with traditional learning resources,

"*Imagine if I want to teach the function of the heart to my students. If I only use texts without motion stimulus, I cannot relay the concepts effectively. However, when I attach an audio-video clip, the learning outcome will be improved. As the old saying says "a picture is worth a thousand words" indicates that certainly web resources are capable of promoting the learning outcome by providing multi-media stimulus*".

[Biology, Interview, 10 June 2012]

One chemistry teacher commented on the importance of using audio-visual attributes of web resources in enhancing learning outcome,

"*Using animation and images beside written texts will improve students' learning. Unlike text books that contain words with no colourful images, multimedia based web learning resources*

enhances students' understanding of the subject matter through audio-visual attributes that are integrated within the texts".

[Chemistry, Interview, 20 August 2012]

According to the participants, unlike the static images of textbooks, multimedia based dynamic pictures associated with printed texts are capable of transmitting learning concepts quickly from the teacher to the learner. The following teacher voiced out this belief,

"*I use web animations as an alternative to static pictures in the textbooks. Unlike traditional teaching methods such as oral explanation by teachers in the classroom and showing some printed pictures to students, animations provide an interactive learning environment. For example, moving pictures help learners to observe a dynamic picture of an electromechanical generator. Hence, it makes it easier for students to understand the function of the generator*".

[Physics, Interview, 19 April 2012]

It appears that Farsi educational web sites that were frequented are those of that employ multimedia components such as colorful images and sounds than just texts. A participant indicated this observation,

"*I like those websites that provide multimedia attributes beside texts, as I believe that multi-media attributes help increase students' understanding of a subject matter. I prefer to attach a lot of images to a short text to produce slides for my classroom teaching*".

[Chemistry, FG2, 22 January 2012]

5.5. Feasible classroom instruction via simulation

Feasibility of this research is defined as the capability of FWBLRs to execute or carry out an educational activity practically and effectively. The results of the current research revealed that the teachers were motivated to use web-based learning resources because such resources allowed the practical simulation of teaching–learning activities. Participants indicated that, using simulation increased the teacher's ability to deal with the challenges associated with real-world teaching–learning environments. The learner in this study could also learn easily as simulation could take the form of "Virtual Laboratories".

According to the focus group's discussion, it is the common practice among teachers in smart schools to use virtual laboratories. One member of a group asserted that,

"*Usually teachers in smart schools use the virtual laboratories to deal with some shortages of laboratory's instruments, materials and physical space*".

[Physics, FG1, 21 January 2012]

Another chemistry teacher emphasized the advantages of virtual environment in handling scientific experiments,

"*There were some chemical tests that we could not perform in physical labs in the past, but now virtual laboratories provide this opportunity for us*".

[Chemistry, Interview, 10 September 2012]

The participants also encountered a number of challenges related to the physical environments such as limited access to equipments and inadequate physical space in the laboratories to carry out chemical experiments. Other challenges faced were costly chemical materials and the anxiety associated with the risks of working with harmful chemicals. To deal with such challenges, teachers have started to consider the use of virtual laboratories. Such belief was reflected in the following statement by a chemistry teacher,

"*There are so many chemical experiments that students have to perform, and they have to complete them in 90 min which is quite impossible! Moreover, I have to oversee more than 30 students to make sure all experiments work well. Sometimes, it is impossible to do the whole tests in the physical laboratory*".

[Chemistry, Interview, 16 June 2012]

Related to this issue another chemistry teacher said this during a focus group's discussion,

"*We have limited lab equipment and chemical stocks…it will be such a waste if experiments do not work, and they have to repeat them since some of these materials are very expensive*"

[Chemistry, FG1, 21 January 2012]

Addressing the safety issues in physical laboratories, a chemistry teacher noted,

"*We are also worried about the students' safety as they are inexperienced, and vulnerable to make mistakes while working with harmful chemical materials. Hence, using virtual laboratories enable students to carry out chemical tests in a more practical manner in the virtual environments*".

[Chemistry, Interview, 10 September 2012]

6. Discussion

Discussion with the participants of current study revealed that perceived pedagogical usability of FWBLRs is likely to capture teachers' motivation in using such resources in classroom teaching. The teachers may replace traditional resources with web-based learning resources in order to accelerate transfer of learning concepts to their students in distinctive and attractive ways. This is reflected in one of the teachers' reasons to use FWBLRs on the capability of FWBLRs itself to establish student-centered teaching–learning environment. The teachers perceived that web resources have the potential to capture students' interests to be active in the learning process, because the students preferred such resources and were keen users. Several researchers (Abrizah & Zainab, 2011; Afshari et al., 2009; Bland et al., 1979; Kay et al., 2009; Light & Polin, 2010; Recker et al., 2004; Silius et al., 2011; Wu et al., 2005) have confirmed that using digital resources provided an opportunity to engage students with the learning process and establish an effective student-centered teaching–learning environment.

Similar to the teachers who participated in the current study, the teacher participants of previous studies (Light & Polin, 2010; Silius et al., 2011) also believed that using web resources allow them to feel more connected to their students and provide a new way of engaging them in classroom learning.

Other research findings had also indicated that capturing the students' motivation in a specific topic was one of the main reasons why teachers use web resources (Kay et al., 2009). These researchers found that the students' performances increased significantly (almost by 40%) when they use web resources in conjunction with a variety of teaching strategies. Student-Centered teaching approach could be achieved using the attributes of FWBLRs such as quick and easy access, multi-media stimulus, and benefit of using virtual teaching–learning environment such as virtual laboratories. Subsequently, although the attractiveness of web resources would excite the teachers' eagerness to use them in their students' instruction, the teachers might be reluctant to use them if they do not consider them as useful information resources in meeting their students' actual needs. As the result indicated, smart school teachers' perception of usefulness of FWBLRs might be affected by the characteristics of their use context and also characteristics of stakeholders of FWBLRs.

Regarding the context of use, the results of the current research revealed that despite the huge benefits of the use of web-resources conceived and experienced by the teachers in this study, the evaluation policies imposed to the schools seem to play a key role in the teachers' preferences when it comes to teaching and students' evaluation. In reality, Iranian smart schools still give priority to using traditional resources, identifying them as more reliable information resources containing trustworthy contents. A biology teacher claimed that teachers in smart schools rely on textbooks more than web resources even when the content of web resources might be more credible (Biology, Interview, 20 February 2012). She (the biology teacher) mentioned that the students' assessment policy requires the teachers to prepare the final examination questions using only the textbooks. Likewise, the universities' entrance's examination questions (known as konkoor in Iran) are also designed based on traditional resources. These policies force the teachers to rely on traditional resources more than on FWBLRs.

Attaran et al. (2012) in their study found that typically in Iranian smart schools, the use of traditional resources were given priority before web resources. The governing policy in schools determined the prevalent students' assessment method in Iranian educational context. Their findings suggested that, although the level of mastery over ICT was acceptable among smart school teachers, yet a decline in commitment to ICT use was observed, and this stemmed from discouraging policies.

For the successful integration of FWBLRs in classroom teaching, more attention needs to be given for its application in the educational context. As such, it is better to explore possible ways to give equal values to FWBLRs as well as to traditional resources. In turn, it can be made possible to consider the use of web resources as core learning resources in schools that can be used for students' instruction.

The second consideration in terms of establishing effective use of FWBLRs addresses stakeholders' competency to produce, provide, select and use FWBLRs. Although the teachers in this study might be aware of the desirable features of web-based learning resources, they were often faced with challenges that reduced their motivation to use FWBLRs for classroom teaching. The challenges encompass various aspects such as, content trustworthiness, content comprehensiveness, and inconsistent presentation and accessibility problems. For example, related to the content-based challenges, the volatility of web environment is likely to provide the trustworthiness problems (Mansourian, 2004; Metzger & Flanagin, 2013; Metzger, Flanagin, & Zwarun, 2003; Pattanaphanchai, O'Hara & Hall, 2013; Rieh & Danielson, 2007; Stvilia, Twidale, Gasser, & Smith, 2006). The uncontrolled web-based publishing environment, where every biased or unskilled author could post low quality information that would reduce users' trust in web information resources. The collaboration of several groups of stakeholders is required in order to obtain an effective outcome in terms of using FWBLRs that are distributed in an uncontrolled environment. Such collaboration could be established among authors/creators, publishers, and users of FWBLRs, who should pay more attention to producing trustworthy information resources. The publishers of FWBLRs should also concentrate on providing suitable presentation and consistent layout of FWBLRs. Further, the owners of educational Website/Web logs are expected to provide teachers and students who are interested to use FWBLRs with easy and effortless access to information.

Finally, the successful use of FWBLRs entails information literate users. Information literate encompasses competency in searching, evaluating, selecting and using of FWBLRs. For example, users are expected to have the required skills such as performing suitable search strategy to achieve desirable results.

The study is not without limitation. Because of the novelty of the topic at hand, using FWBLRs for instructional purpose, to the date of this research only a few schools in Iran had initiated serious use of FWBLRs in classroom. Subsequently recruiting skillful teachers who not only had high level experience to use of FWBLRs for classroom teaching but also were enthusiastic to attend repetitive interview sessions and to respond to the additional questions patiently was one of the limitations of this study. The other limitation of current research was related to distance barriers for the researchers who had to travel long distance to reach the participants and holding interview sessions with them frequently.

7. Conclusion

Stakeholders of FWBLRs could apply the results of this study and be more confident in terms of providing suitable learning web resources. The stakeholders in this context are school librarians, information producers, educational website designers and school managers.

School librarians who are engaged in searching, evaluating and selecting web information resources and to include these resources into their library holdings can benefit from the results of this study. Using the teacher-acceptance criteria, which emerged from the results of this study enables the Iranian librarians to select information resources based on actual user needs.

The awareness about user acceptance criteria, which emerged from the results of this study, enables information producers to produce appropriate information resources compatible to the educational needs of Iranian students. Therefore, the criteria had highlighted a wide range of use of the web-based learning resources that would help accelerate knowledge development among both Iranian teachers and students about using new technology in classroom learning.

This study also indicate issues related to suitable visual design practices of websites, which could be considered by website designers to sustain Iranian teachers and students loyalty to web pages. Focusing on user-acceptance features of websites enable educational websites' designers to produce more attractive layouts, which could improve teaching–learning process using appropriate designs.

Effective use of ICT in school environment requires not only equipments but also enthusiastic teachers. To have teachers incorporate technologies in their classroom practice in innovative and engaging ways requires specific professional learning support. Being in harmony with technological changes entails a systematic review done by school managers to identify the impact of existing ICT provisions and practices on teachers' motivation, confidence and competencies. School managers could use the results from this study to identify not only teachers' current technological level but also training and emotional needs for integrating ICT in classroom teaching–learning activities effectively.

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