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Research paper

Highlighting the Critical Features of Virtual School in Developing Nation

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Abstract.

In the recent years, the high quality of communication technologies enhanced the learning manners and support the interactions among educational stakeholders (teacher, student, managements of schools and parents). With these advantages in the current modern technologies, the present electronic school features do not provide all the requirements of students and educational institutions, due to the varying students' needs, goals, backgrounds, knowledge levels, and learning capabilities. Moreover, the previous studies uncover some weaknesses in the existing electronic learning systems, such as lack of interaction among stakeholders and the difficulty of supporting cooperative work. As for features model, there is scarcity in the appropriate properties of the electronic school feature model to develop the virtual learning specifically for the secondary school. Based on these arguments, this study sought to propose features model of electronic school to link stakeholders in the educational process and fill the gap in the previous literature. With regard to data collection, the secondary and primary data were exploited to achieve the aim of this study. The results of this empirical study can be harnessed to design a comprehensive features model of electronic secondary school for particular education institutions and other conflict areas to complement the existing traditional classrooms.

Keywords: *electronic school, features model, secondary school, experts' viewpoint.*

1. Introduction

Over the past decade teaching process has been moving increasingly from the class room to online. online environment learning (or called e-learning) is a vast and somewhat disconnected area of inquiry that has attracted interest from disciplines as diverse as educational psychology, computer science, information science, management, communications, and more. According to Persico, Manca and Pozzi (2014) E-learning is becoming an increasingly widespread approach in higher education institutions in Europe and worldwide. However, Beetham and Sharpe (2013) referred that, there is an understanding that the evolution of technology in learning environments dictates the electronic learning content and processes rather than incorporating pedagogic principles and determining the actual learning features for learners, which will vary from region to region.

Furthermore, the implementation and development of online learning in the education sector suffers from a shortage of academic and practical literature compared to the situation in higher education (Taha, 2014). Taha adds that, there is also a lack of academic and practical studies that involve both stakeholders (students and teachers) for a more comprehensive overview of the obstacles to the educational process. Moreover, Abdullahi (2011) asserted that, there is a lack of features study to develop the electronic school system specifically for the secondary school students. This claim also supported by Kaufman (2015) and Yu, Yuen & Park (2012), who stated that, much of the research that focused on online learning was connected to higher-level institutions (such as Colleges or Universities), while research has yet to focus on online learning within a schools setting. Based on the aforementioned arguments, the present study sought of investigates on the critical features of the electronic school in the development nation such as Iraq.

2. Literature Review

The early promise of virtual schooling (school courses offered through distance technologies) was to provide access to high-quality educational opportunities for students who traditionally lack such opportunities: rural, underserved, and at-risk populations (Davis & Roblyer, 2005). However, there are indications that virtual schooling opportunities tend to benefit primarily already-advantaged learners (Roblyer & Marshall, 2003; Roblyer, et. al, 2008). Growing numbers of middle and high school students are taking virtual courses (Watson & Ryan, 2007), but compared to traditional in-person courses, virtual school courses almost reflect higher student failure and dropout rates (Kozma & Zucker, 2003).

The existing researches mostly focused on higher education institutions, and more specifically on the developed countries (Anderson, 2007; Thompson, 2007). Furthermore, the previous studies focused on features in learning management system (LMS) and the documentation management rather than determined the features for e-school environment. However, the study conducted by Jalil, et al. (2015) highlighted only the pedagogical features. In addition, Alsaleh and Haron (2015) concentrated on some

functional features related to KSS such as Rich Site Summary (RSS), consultation services, expert information interconnections among disciplines, search engine and the last functional tool was the accessibility. The study conducted by Alsaleh and Haron (2015) did not cover all the e-school features, but merely concentrated on the pedagogical dimension and only highlighted the design aspect.

While, Chumpai (2011) shed light on the communication features for instance, chat room and forum. Unfortunately, Chumpai ignore other important features for the educational process such as evaluation and share repository. Similarity, the study conducted by Harun (2010) focused on the communication features such as, announcements and forum. Harun also used some evaluation features (for instance assignment and quiz) rather than others features. On the other hand, Johari (2004) highlighted the management features and ignore other essential features that enhance the performance of the e-school and achieve the stakeholders' needs.

Overall, all the previous studies highlighted some of the important features (whether functional or non-functional). In addition, these studies did not exploit all current available requirements for open sources education platforms, such as MOODLE. Therefore, the current study strives to harness this platform to identify the suitable requirements for secondary schools in Iraq.

3. Research Method

Features identification is arguably the most important part of the whole build system process. There are many elicitation techniques and also methodologies that propose complete roadmaps using a combination of different techniques and features. Some of these techniques are interviews, workshops, observational and documentation studies etc. Each technique has its particular effectiveness in particular situations. In this study, the features gathering techniques being used are multi fact finding through documents review and experts review.

In the methodological part, the researchers extracted and reviewed raw data through two phases.. First phase is documentation review, the researchers in this phase of the research extractes the more common features that mentioned in the previous studies. While, Second phase is experts review, in this phase the elicited features checked by three experts from different secondary schools to highlight the main features that must be available in any e-learning system for secondary schools.

Phase One: Documentation Review

Documentation studies provide ways to explore the existing documentation or knowledge and acquire requirements from a series of deductions (Zhang, 2007). As well as try reuse features from another similar project; analyzing its features specification and extracting what might be relevant to the project at hand as well. In this stage, elicited the most important features that be suitable of the stakeholders (students, teachers, parents and managers of schools) who have relation with educational process in secondary school be carried out. The proposed features were elicited from the dominant researchers in this context (such as Uţă, 2006; Buzzetto-More, 2007; Al-Ajlan, 2012; Lotif et al, 2013).

Phase two: Experts' Reviews

In the last phase from identify the features, the list of features that elicited from previous studies checked through three experts who work in different secondary schools. The experts were selected based on their strong background in IT and learning, where each of them has more than 10 years of experience. The details of the experts' profile are presented in Table 1. In general, in this stage the experts checked the selected features from the literatures to ensure all the important features are covered. In fact, this study focus mainly on the electronic school features to design satisfy and comprehensive e-school system for secondary school in developing countries.

Table 1: Experts from secondary school

Name	Institution	Position	Field experience	Experience (in years)	Email
Zakaria Bin Ahmed	SMK Jitra	I.T Coordinator	ICT	12	Zakba01@gmail.com
Nor Ain Sulaiman	SMK Jitra	Teacher	Visual ART, ICT	18	Ainnas24@gmail.com
Wael H. Ali	Alnajah	Teacher	Information Technology	10	2017wael@gmail.com

4. Results

Understanding the important features is essential in developing software. Without explore the right features and the suitable for stakeholders and what educational institution needs, developing a system will be difficult. Hence, stage two describes the features for the system build-up for this study. Besides, addressing what the system needs the features for this study addresses also its interoperability issues. Basically, the proposed features are based on critical review of four practical studies and experts review.

Results of Phase one:

The researchers highlighted the most important features that related with e-school system which may cover the needs of stakeholders (students, teachers, parents and managers of schools) from prior literatures Figure 1 shown the features that elicited from previous studies.

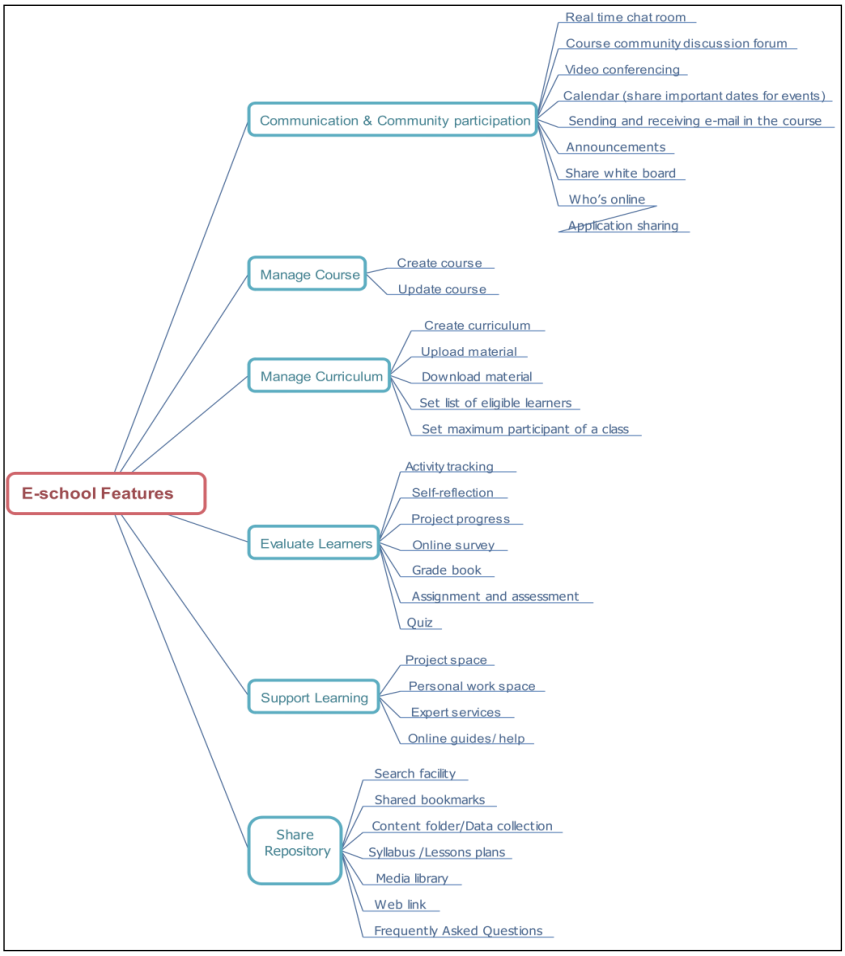

Figure 1: Functional features Elicitation from previous studies.

Figure 1 shows that, all the features e-learning system proposed in the works of Uţă (2006), Buzzetto-More (2007), Al-Ajlan (2012) and Lotif et al. (2013). It presents 34 e-learning system functional modules in entirety, and this shows that the reviewed studies lack at least 12 functional modules each. The highest scarcity study is Uţă (2006), with 19, and the lowest is Al-Ajlan (2012) with 12. This study proposes an improved functional features that encompasses the missing functional modules of the studies, for instance Uta (2006) and Buzzetto-More (2007) lack online guides, search facility, personalized learning workspace, among others. Al-Ajlan (2012) and Lotif et al. (2013) lack provision for shared repository, grade book assignment. Table 4.1 presents the functional features that elicited from these studies.

Based on the features from the previous studies, the researchers proposed selected features to the users for choosing the most important functions and compatible with their work.

Results of phase two:

The features were selected from prior literatures checked by three experts from secondary schools to ensure all the important features are covered. The experts were selected based on their strong background in IT and learning, where each of them has more than 10 years of experience. The details of the experts' profile are presented in Table 1. Table 2 shows the selection of features by 3 experts which are represented as Expert A, Expert B and Expert C.

Table 2: The Experts' Feedback

		Expert A			Expert B			Expert C			Total		
Module	Functional Feature	Yes	No	I don't know	Yes	No	I don't know	Yes	No	I don't know	No. Yes	No. No	No. Don't Know
Communication & Community participation	Real time chat room	√				√		√			2	1	0
	Course community discussion forum	√			√			√			3	0	0
	Video conferencing		√		√				√		1	2	0
	Calendar (share Important Dates For Events)	√			√			√			3	0	0
	Sending and receiving e-mail in the course	√			√			√			3	0	0
	Announcements	√			√			√			3	0	0
	Share white board	√			√			√			3	0	0
	Who's online	√				√			√		1	2	0
	Application sharing		√		√				√		1	2	0

Manage Course	Create course	√			√			√			3	0	0
	Update course	√			√			√			3	0	0
Manage Curriculum	Create curriculum	√			√			√			3	0	0
	Upload material	√			√			√			3	0	0
	Download material	√			√			√			3	0	0
	Set list of eligible learners	√				√		√			2	1	0
	Set maximum participant of a class		√			√			√		0	3	0
Evaluate Learners	View activity tracking	√			√			√			3	0	0
	Self-reflection		√		√				√		1	2	0
	Project progress		√		√				√		1	2	0
	Online survey	√			√			√			3	0	0
	Grade book	√			√			√			3	0	0
	Assignment and assessment	√			√			√			3	0	0
	Quiz	√			√			√			3	0	0
Learning Features	Project space		√		√				√		1	2	0
	Personal work space	√			√			√			3	0	0
	Expert services		√			√			√		0	3	0
	Online guides/ help	√			√			√			3	0	0
Share Repository	Search facility	√			√			√			3	0	0
	Shared bookmarks		√			√		√			1	2	0
	Content folder /Data collection	√			√			√			3	0	0
	Syllabus /Lessons plans	√			√			√			3	0	0
	Media library	√			√			√			3	0	0
	Web link	√			√			√			3	0	0
	Frequently Asked Questions	√			√			√			3	0	0

The selected features based on the feedback from the experts. Where, the features considers desirable when two experts chose (yes) option. However, the result from the experts' review shows some requirements need to be included such as share white board as well as manage user (create, edit and delete user). While, some of the requirements are not necessary or duplicate, for instance who's online (with real time chat) and shared bookmarks (with upload and download materials). Figure 2 presented the final list of features after the experts' feedback.

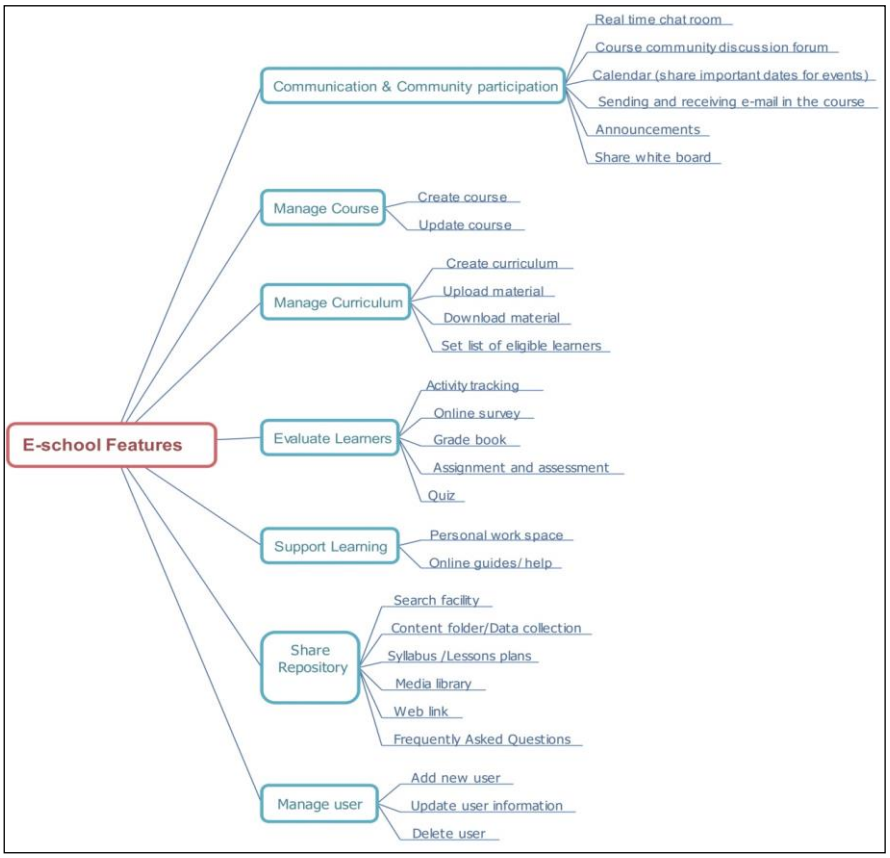

Figure 2: The Final List of features(sophisticated e-secondary school features)

These final features it is considered comprehensive features can help the educational institutions such as schools and ministry of education for designing suitable e-school systems cover all the user's needs. On the top of that, these features will aid the developers of the online learning to develop e-school system that will be fit with stakeholders needs. Furthermore, such these features which depended on the real needs of local users will make the e-learning environment more interactive and give the stakeholders the opportunity to communicate with each other anytime and anywhere.

5. Conclusions

New technologies can be employed in supporting learning through exploration as well as a cognitive tool for encouraging students in developing their own thinking and approaches for solving problems. There are many e-school systems that provide only the same materials to all students and do not consider their needs or abilities, thus, current existing systems are not suitable to all students. The results reveal that the participants are satisfied with the proposed features, and these features meet all the stakeholders' needs. Therefore, the model proposed in this study can be used for particular education institutions to complement the existing traditional classrooms. Recommended for the new coming researcher and designer to harness these feature to developing the modern electronic secondary school to insure all the important features are covered and all the stakeholders needs are included. Furthermore, as each e-school system give the users (students, teachers, parents and managers of schools) more interactive and communication between each others.

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