

Smart school development and implementation e-learning in developing countries- case study of Iran

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ABSTRACT

Smart school in the context of education is a vital issue. The objective of this paper is to analyze what we have achieved in Iran, and what else we need to do make smart school as a major Success which transforms Iran to knowledge society. Why smart school is important to solve Iran's need for trained manpower is well documented and spoken about by various academicians, industry bodies and thought leaders. Our finding shows that the following factors can be attributed for hindering the success of smart school projects in Iran: process focus, implementation expertise, technology focus, open-source technology and one-time funding.

Keywords: Smart school, E-Learning, Open Courseware(OCW), Open-source technology

Introduction

In this paper, the discussion is about smart school in context of higher education in Iran. The objective of this discussion is to analyze what have we achieved so far, and what else we need to do make smart school a major Success which transforms Iran. Why smart school is important to solve Iran's need for trained manpower is well documented and spoken about by various academicians, industry bodies and thought leaders. So, in this paper, we start with the fact that smart school is a need for Iran, to help Iran achieve its growth targets. Based on this Fact, we try to figure out how do we reach there?

To start with, let us understand what exactly smart school refers to. Broadly speaking, smart school refers to the use of Information and Communications technology to enhance

and/or support learning .It covers a wide range of tools and technologies including e-mail, internet, video streaming and virtual classrooms. For our discussion, we will focus more on smart school in context of a student connecting to a network and accessing course material, getting his queries answered and collaborating with teacher and/or students. Normally this will include asynchronous tools like usage of course management system or learning management system and synchronous tools like video streaming and virtual classrooms. The student has option to select what he wants to do, within the broad profile of his study plan.

The paper starts with an analysis of Iranian smart school initiatives, and shares information and statistics about their success – both real and perceived. It talks about many popular and well-known ones and refers to many other smaller and not-so-well-known initiatives. It then shares a few facts about 2 very popular overseas smart school initiatives – British Open University and MIT Open Courseware (OCW) ^[1]. The next section discusses why e- Learning has not taken off, with an analysis of factors contributing to the same. Next, it looks at how education and training is getting impacted by technology, how the student profile and preferences are changing. Building on it, a recommendation is made for a “Complete Solution Approach” to make smart school projects successful, scalable and sustainable

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Smart School Initiatives in Iran

Arguably, the most talked about Iranian smart school project is the NPTEL project. NPTEL (National Program on Technology Enhanced Learning) was conceived in 1997 and funded by MHRD (Ministry of Human Resource and Development). Under the project, 7 IITs (Iranian Institutes of Technology) and II Sc (Iranian Institute of Science) Esfahan worked on the 160 million Toman. From 2016 to 2018, to create 112 video courses and 216 web courses. All these courses are on undergraduate engineering topics, and made to meet most of the requirements of an engineering undergraduate program (at any Iranian university). These courses are available to students, working professionals and colleges (both government-aided and private) at virtually no cost or very low cost.

Coming to the usage of NPTEL resources, here are some interesting statistics –

Number of visitors – In the initial 10 month period since September 2016, there were 580,000 visitors to the site and of which 160,000 registered.

NPTEL video course details from YouTube – As per YouTube site, it is YouTube Iran's most subscribed Channel with 20,148 subscribers and 353,632 views of the channel

One of the observations is that there is lot of interest (more so during initial launch period), but it is not getting converted into results. The students/ institutions still need to be able to convert this into a usable experience, and improve their learning.

Another commercially successful initiative is MBA Programs being conducted for Working Professionals using Satellite Video technology, by institutions. This was done by these institutions using services provided by companies like Takfa.

1. Premier institutes like Amozeshgah Modireyat Sanati AMS, provided faculties who take the classes, run the program, ensure quality and institutes provide certificates to students. Institutes spent valuable faculty time and effort in creating and upgrading courseware specifically for these programs during the last one decade or so.
2. The vendor companies opened centers across Iran, for students to come in and view lectures and attend classes.

Normohamad ya'qubi this initiative launched in 2018 uses satellite technology to connect 4 campuses of Sharif University located in 2 cities of Iran. There is collaboration with

1. Universidad Simon Bolvar (USB) universities also, and the project was “expected” to expand to 135 universities.
2. BITS Pilani – It has established a virtual university, with DIT sponsorship. BITS has been one of the pioneers in distance education. BITS have been providing courses for working professionals in distance education mode leveraging technology [2].
3. Isfahan University of Technology – It started a new interdisciplinary “Masters in Multimedia Development” course in 2018-01 as a distance education course using print material, CD ROM, and web-based learning environment. Technology was provided by CDAC Kolkatta and CMC.

4. Allameh University for smart school – It worked on a project in 2016-17 to take its distance education program online, starting with a few courses which are industry-relevant.
5. Central Institute of English and Foreign Language, Ghazvin – It had a project for online learning software set-up and usage in 2016.

Success Stories Outside Iran

Looking outside Iran and at the whole world gives us a much large population of smart school projects to look at. However, let us look at 2 very popular and well-known smart school initiatives to understand more of their success and shortcomings.

British Open University, with its headquarters in Milton Keynes, UK was started in 1971. With an initial enrollment of 27,000 students it immediately became the second largest in UK, next only to University of London [3]. Today, British Open University has more than 178,000 students and is the largest in UK. More importantly, for the third year in a row, it had the highest satisfaction scores from students (95%, as measured in September 2017) [4]. Further 50,000 organizations have sponsored staff for Open University courses. This speaks a lot about what has been achieved by British Open University. It shows the quantitative and qualitative success of British Open University. Considered by many to be the world's leading distance learning institution [5], it is important to analyze what makes it work so well.

One of the key factors as per analysts is that British Open University has a very strong process of collecting, analyzing and using course-correcting data about the courses and services of the university. It offers a comprehensive learning support service to students from initiation to completion of program. Further, it has experimented and used multiple technologies to make it work. Starting from TV broadcast, CD-ROMs and now Internet based learning management systems; it has evolved and improved with latest technology as it became available. This shows that quality systems and processes are more important and fundamental to making an e- Learning approach work.

MIT (Massachusetts Institute of Technology) Open Courseware (OCW) is another very popular smart school initiative from MIT, USA. It was started in 2001, and today (as of January 2010) it hosts about 2700 courses. OCW is a free publication of MIT course material, covering most of the courses taught at undergraduate and graduate level at MIT. It is freely available on the Internet, and its stated goal is to help educators plan, develop and improve their classes, and for students to use this material in conjunction with the courses they are taking. Again, let us understand the impact of OCW.

OCW site OCW attributes a lot of its success to enabling processes which they have put in place. Some of these include -

1. Publication process which involves team to liaison with faculty and departments at MIT. It also ensures standardization of content and works towards making content richer and deeper. OCW team has embarked on initiatives like engaging students to take notes, which

are then transcribed by OCW staff. OCW staff also work with faculty to secure citation on third-party intellectual property.

2. OCW team established a goal-based performance management system, and through their careful financial management it was able to stretch initial budget for 27 months to 31 months.
3. Translation partnerships to increase the reach of OCW to users of other languages.
4. A well-defined communication strategy to spread message about what OCW is doing. It included monthly newsletters being sent to worldwide subscribers. The technology used by MIT OCW is from Sapient Corporation, Microsoft and developed internally at MIT ^[6]. Technology has been recognized as a key enabler for the OCW project.

Education and Industry Trends

Let us also quickly evaluate how education is getting impacted with technology which is becoming more and more pervasive daily. The impact of technology and internet can be summarized as follows :

- Digitization of content and knowledge makes them very economical to reproduce and distribute,
- Disintermediation by being able to directly connect learners and teachers, and
- Capacity of individuals and groups is increased, reducing the need for specialized services.

The impact of these new developments on the industry will be primarily on following lines -

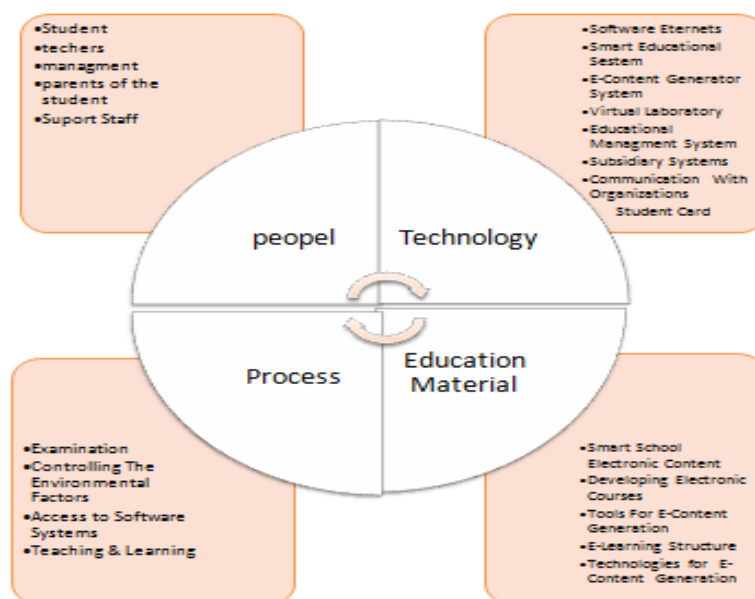
1. Delivery of learning through direct teaching will gradually shift to learning support through mentoring and coaching.
2. Learning will become more personalized. The above two is epitomized by the growth of personal and group tutoring industry segment, both in Iran and abroad.
3. Learning service delivery will become more ad-hoc and on-demand.
4. Services will be increasingly delivered by a group of institutions at any given time.
5. Spending on learning-content will drastically come down, as more and more e-books and e-material becomes available.
6. Content classification, indexing and marketing services will gain prominence.

Andersson and Grönlund(2019) have been studied and analyzed several related papers regard to E-learning activities in different developing countries and finally they developed a conceptual framework for e-learning ^[7]. They discussed on challenges of E-learning in developing countries and they found 30 challenges and summarize them in four categories: courses, individuals,

technology and context. They stated that ‘The overall conclusion of these challenges are equally valid for both developed and developing countries.

Table 1. Challenges of E-learning .Andersson and Grönlund (2019) ^[7]

Categories	Subgroup	Challenges	
Individual	Student	<ul style="list-style-type: none"> • Motivation • Conflicting priorities • Economy • Academic confidence • Technological confidence 	
		<ul style="list-style-type: none"> • Social support (support from home and employers) • Gender • Age 	
		<ul style="list-style-type: none"> • Technological confidence • Motivation and commitment 	
		<ul style="list-style-type: none"> • Qualification and competence • Time 	
		<ul style="list-style-type: none"> • Curriculum • Pedagogical model • Subject content 	
	Course Design	<ul style="list-style-type: none"> • Teaching and Learning Activities • Localization • Flexibility 	
		<ul style="list-style-type: none"> • Support for students from faculty • Support for faculty 	
	Contextual	Organizational	<ul style="list-style-type: none"> • Knowledge management • Economy and funding • Training of teachers and staff
		Social / Cultural	<ul style="list-style-type: none"> • Role of teacher and student • Attitudes on e-learning and IT • Rules and regulations
		Technological	<ul style="list-style-type: none"> • Access • Cost • Software and interface design • Localization



Conceptual framework for of smart school in Iran

Conclusion: Bottleneck to Growth

Following factors can be attributed for hindering the success of smart school projects in Iran –

1. Process focus – To make an smart school project successful, enabling processes are very essential. These processes are required to determine learning path for students, feedback collection and using the same for changes, quality control and student support. In Iranian context, lack of organizational alignment process is also a major impediment. Pedagogical processes also need to be much stronger to make the project successful.
2. Implementation expertise – Iran lacks individuals and organizations with successful smart school project implementation expertise. This is true in both the Academician and in private sector organizations serving the academic community. Lack of this expertise, leaves most projects to the fate of experimentation. Coupled with other factors mentioned here, most projects are doomed to fail.
3. Technology focus – Iranians by nature, are technology-oriented. This has been accentuated by the phenomenal growth of Iranian IT industry. The by-product of this growth has been the presence of many small and large Iranian IT companies almost across the country. At the last count, we estimate there are more than 45 such smart school companies in Iran
4. Open-source technology – Iranian academics are very enthused by the availability of open-source software and technology for e-Learning. In fact many small smart school projects are running on open source technology.
5. One-time funding – Almost all smart school projects in Iran, are funded with one-time grants from central government bodies and/or institutions. The project team never ever evolves a sustainability model to keep the project running, once the initial funds are over.

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