# Analysis of distance learning in smart schools in Iran: A case study of Tehran's smart schools

Vahid Motamedi

Assistant Professor Dr.

Department of Educational Technology, Faculty of Psychology & Education Kharazmi University,

Tehran, Iran

motamedivahid@ymail.com

vmotamedi@khu.ac.ir

**ABSTRACT**

In the paradigm of information society the structure and facts have become flexible and subjective. In the recent social - economic order, IT and communication have taken over the leading role. Distance learning in smart schools is one of the flexible realities in the education field that has crossed the format of the hard and inflexible traditional schools such as boundaries of time and place and has provided educational content by using multimedia and networking software and computers. This study analyzed distance learning in smart schools within the regions of education of Tehran. The subjects for study were teachers and administrative staff of Tehran's four smart schools. Their opinions were collected according to Likert spectrum. Then we attempted to test the hypothesis using Pearson's correlation and regression testing. Results indicated that there should be an emphasis on systematic approach in distance training and also that one-dimensional view lead distance learning objectives to fail. There was a significant relationship between elements of software and hardware infrastructure and distance learning in smart schools and also between the ability of teachers and the establishment of distance education.

**Keywords:** distance learning, smart schools, infrastructure, software and hardware, Tehran

## INTRODUCTION

Society is in transition to a new model of economic – social order based on knowledge and information processing. In other words, knowledge and information are the raw material for a new society. The new structures and factors associated with structures that do not completely conform to the requirement of industrial paradigm. While in preceded diverse range of industries often faced with hard facts, and structures, uncompromising physical and material, in the paradigm of information society, these facts and structures are flexible and subjective. In the recent economic- social order IT and communication have taken over the leading role so even workers become knowledge-based workforce. This technology is actually a set of tools and methods that collect, store, retrieve process and distribute the information in variety form and provide means to overcome the problem of unresolved historical detachment and lack of access to information and knowledge which are the main obstacles to the development of education.

ICT created new look in educational landscape due to changes in content and methods of learning and the function of educational institutions (Salimi & Ghonoodi, 2011). Use of these technologies has changed the educational system (Ozpolat & Akar, 2009; Liu, Liao, & Pratt, 2009; Liaw, Huang, Chen, 2007) and strengthens the processes of learning and teaching (Paechter & Maier, 2010). On the basis of previous concept, learning is fundamentally changing that it is no longer limited to attend classes (Wang, Wang, Shee, 2007). Distance learning is described "as instructional delivery that takes place when learners and teachers are separated throughout the learning process by time and physical distance" (Motamedi, 2001, 386). Distance learning is a phenomenon that has been established due to the learners' tendency to seek non-personal access to course material, limitations of time, place, and problems of mandatory attendance and on time attendance in academic classes. Computer networks, especially the Internet and the World Wide Web in this way have created a special facility.

In distance education, students can take courses without reference to their own school buildings to register and can participate in virtual classes without limits of time and place. Therefore, the role of information technologies, the Internet,

software for distance learning, virtual libraries, web and its interactive capabilities specially link technology, hypertext, and meta-data models is undeniable. These cases as a robust and secure infrastructure support the process of distance education via the Internet. As a result of the interactions between the system and the students, the classroom environment and human communication are simulated and even by providing answers to possible questions students may complete the training process. In the field of distance education in addition to the various technologies that are used, items such as the ability of teachers and students, available library facilities, network support, software facilities, elementary training, study skills, improving procurement procedures, transmission, delivery and evaluation of training materials, types of IT-based training, and training management also arise; that all of these play an effective role in improving the quality of learning and solving problems of absence in traditional classroom and promote scientific relations.

Iran is still in the early stages of planning and implementation of smart schools plans. According to the Supreme Council of Information and Communication Technology of Ministry of Education, pilot implementation of the model began 2008 in four schools in Tehran (Absal Girls High School in district 4, Call Liberty School in district 5, Dr. Mosaheb Boy High School in district 7, and Workers Martyrs Boy High School in district 15). In the 2011-12 school years, the majority of nationwide education institutions have decided to implement the smart schools project. The research questions for this study are:

- What facilities and equipment required for classes via the Internet?

- What skills are smart schools teachers and staff required to execute distance learning courses and what skills do they have.

- What is the current status of the smart schools facilities?

**Purpose**

Given that distance education has become prevalent in the last two decades, it seems to have had a good result in different disciplines and countries and has changed the category of education from teaching to learning (Berge & Colllins, 1995). In addition, smart schools in the world have had good growth even in Asia (Norman, 2001). However, in Iran we are facing the changed nature of smart school's pattern. Up to now what has been done in smart schools was at the level of installing projectors and smart boards. While looking at the various components of this model implies that both the hardware infrastructure such as computer accessories, Internet networking and LAN systems, designing classrooms to suit the needs of smart schools and software infrastructures such as backup rules and regulations and smart schools teaching and learning, digital libraries, and skilled and trained manpower should be seriously considered. Therefore, further study is necessary to assess the facilities of smart schools.

**What is Smart School?**

Smart schools are schools that are flexible with respect to the features and capabilities of students (Salimi & Ghonoodi, 2011). Computer also has affects in teaching and evaluation
and changing of curriculum. As the Internet and accessing web sites are of major infrastructure planning in smart schools, students gain the ability of processing information so they can increase their amount of learning (Rahimah, 2003). The Malaysian Smart School Roadmap (2005) states that these kind of schools are learning institutions in which all the processes of learning, teaching and management processes reinvent in information age to help students to be effective and able. Smart school is not limited to the use of ICT in teaching and learning but national curriculum and pedagogy, teachers, school administrative staff, parents and the community that enhance the education of Malaysian students have important role. In the definition of smart schools in Iran, it is also stated: Smart schools in Iran are schools that are developed schools that for the transmission of traditional concepts, information and communication technology tools will be used. These tools include computer programs, specially the use of applications, such as slides (PowerPoint), lexicography and spreadsheets and Internet facilities (Education and Training Organization of Tehran, 2005). In the smart schools, using the Internet, students have access to vast reservoirs of information. In case of not getting answers to their questions, students interact not only with teacher but also with other students. Content is presented electronically and teacher acts as a guide (Nozari & Nozari, 2013).

**Literature Review**

The use of distance learning in smart schools of America has begun in the United States and has found its way into other countries (Norman, 2001). In the study conducted in India, the author has tried to change the world of computers and communications and explained its role in providing the resources required for Internet-based training course in smart schools and discussed distance education in smart schools in India as case study (Sign, 2007). In a study by Dringus and Scigliano (2000), writers reviewed history of academic courses via the Internet at Nova University in the United States from1980 to 2000 and explained problems and obstacles in the way to do this and discussed how to solve them. In this study the systems and technologies for distance education programs, facilities and capabilities of the system and how is the relationship between students and teachers, and software used in teaching courses and presentations of conferences and remote resources were discussed and analyzed. In another study learning using information technology is classified and explained that in the first stages, available scenarios have discussed this kind of training and methods of preparing materials for them and then the communication services required for each scenario are described. According to this analysis components and features required for each scenario are included in the three protocols – components used in communications, data management and special functionality for learning. The author has tried to analyze all sorts of aspects of distance education with special situations of communication between teacher and student, student and student, and the students with the system (Knierriem-Jasnoch, 2001).

**Methodology**

The present study was a descriptive –analytical research. As it assesses the feasibility and implementation of distance learning of smart schools in Iran, there is a need to review, identify and compare the available facts. Survey research method was used. This means that at first a set of cases were identified as facts of possibility of holding distance learning via the Internet for smart schools using materials, policies have been determined. Then using a questionnaire, Smart School teachers' comments were collected andanalyzed. Using a Likert 5 spectral pattern (totally agrees 5, and completely disagree 1) in the form of questionnaire, indicators were identified.

The population of this research is the smart schools in Tehran. Given the widespread pattern of Tehran, four top smart schools in Tehran have been identified as sample (Absal Girls High School in District 4, Call Liberty School District 5, Dr. Mosaheb Boy High School District 7, and Workers Martyrs Boy High School District 15). These four schools were selected because the model of smart schools in Iran started in 1997 by these schools on an experimental basis.

Our sampling method is two-stage cluster sampling and census. At first among smart schools in Tehran, four clusters were selected with indicators such as history, area ofeducation, student population, and gender.

Data collection was conducted in two phases and with two methods. Firstly, through interviews with some of the teachers of smart schools, information obtained about the facilities, equipment and conditions required for distance courses and online classes especially in the smart schools then specified conditions assessed in the form of questionnaire.

**Data Analysis**

Computer Technician: The teachers and administrators were asked whether it is necessary to have computer technician to administrate distance education.

**Table 1**

Likert for items related to computer technician

| 1 | Completely disagree | Disagree | No idea | Agree | Completely agree |
|---|---|---|---|---|---|
| 2 | 4% | 3% | 7% | 56% | 30% |

Having laboratory specialized to smart schools: The teachers and administrators were asked: for holding distance education courses whether smart school groups should have LAB? Their answer according to the Likert scale is as following table.

**Table 2**

Likert scales for items related to having LAB.

| 1 | Completely disagree | Disagree | No idea | Agree | Completely agree |
|---|---|---|---|---|---|
| 2 | 8% | 12% | 5% | 48% | 27% |

The necessity of having a digital library in school: in this school administrators and teachers were asked about the necessity of having a digital library on the Internet for distance education in smart schools, and their responses are summarized in blow table.

**Table 3**

Likert scales for items related to having a digital library

| 1 | Completely disagree | Disagree | No idea | Agree | Completely agree |
|---|---|---|---|---|---|
| 2 | 8% | 12% | 5% | 48% | 27% |

The necessity of having an electronic and smartboard: The teachers and administrative staff were asked whether it is necessary to have electronic and smartboard for distance education courses in smart schools. Their answers are as following:

**Table 4**

Likert scales for items related to having electronic and smartboard

| 1 | Completely disagree | Disagree | No idea | Agree | Completely agree |
|---|---|---|---|---|---|
| 2 | 12% | 12% | 7% | 40% | 29% |

Internet Networking: Administrative staff and teachers were asked whether it is necessary to have online networking with other schools and the necessary resources and databases that they respond following

**Table 5**

Likert scales for items related to having internet networking

| 1 | Complet<br>ely disagree | Disagr<br>ee | No<br>idea | Agree | Complet<br>ely agree |
|---|---|---|---|---|---|
| 2 | 12% | 12% | 7% | 40% | 29% |

Familiarity with software related to distance education: In this case, the respondents were asked :is it necessary to be familiar with software related to distance education that the responses spectrum is shown below.

**Table 6**

Likert scales for items related to being familiar with related software

| 1 | Compl<br>etely disagree | Disagr<br>ee | No<br>idea | Agree | Compl<br>etely agree |
|---|---|---|---|---|---|
| 2 | 13% | 8% | 3% | 53% | 23% |

The history of holding classes via the Internet: Teachers and administrators were asked whether the history of distance education courses via the Internet is essential that the response spectrum is as follow:

**Table 7**

Likert scales for items related to history of holding Internet classes.

| 1 | Compl<br>etely disagree | Disagr<br>ee | No<br>idea | Agree | Compl<br>etely agree |
|---|---|---|---|---|---|
| 2 | 195% | 20% | 9% | 33% | 29% |

Using online resources as subsidiary:  Teachers were asked whether using online resources by teachers is essential that the response spectrum is as follow:

**Table 8**

Likert for items related to using online resources.

| 1 | Compl<br>etely disagree | Disagr<br>ee | No<br>idea | Agree | Compl<br>etely agree |
|---|---|---|---|---|---|
| 2 | 10% | 5% | 9% | 54% | 25% |

Having specialized LAN system in smart school: Teachers were asked whether designing LAN system is essential to create proper communication with environment and students parents? The responses spectrum is as follow:

**Table 9**

Likert scales for items related to having specialized LAN system

| 1 | Compl etely disagree | Disagr ee | No idea | Agree | Compl etely agree |
|---|---|---|---|---|---|
| 2 | 15% | 9% | 8% | 21% | 27% |

**Testing Hypotheses**

**Hypothesis 1**

Hypothesis H1: There is a significant relationship between the hardware and software infrastructure in smart schools and distance education courses.

Hypothesis H0: There is no significant relationship between the hardware and software infrastructure in smart schools and distance education courses.

A - Pearson correlation test

**Table 9**

Pearson correlationTestof Hypothesis 1

| Correlation coefficient | The number of responder | Significance level |
|---|---|---|
| R=/785 | N=120 | α=/43 |

This test revealed a weak positive correlation between the independent variable of the hardware and software infrastructure and distance education variable in smart schools. Results show that for a unit change in the independent variable, the value .785 unit changes in the dependent variable can be expected. This prediction is bilaterally significant at the level of 95% based on the above test.

A) Regression testing

**Table 9**

Regression testing of Hypothesis 1

| β | Sig. F | F | Adjuste d R² | R² | R |
|---|---|---|---|---|---|
| 0. 785 | 0.0 47 | 22 .886 | 0.061 | 0. 565 | 0. 245 |

The above table shows the regression output. According to this table, F test which is the test of approve or reject a hypothesis, is significant at the level of 95% and conforms the relationship between two variables. β is the kind of statistic indicates that 0.785 changes are predictable. $R^2$ represents the identified amount of variable "Y" in relation to the variable "X". $R^2$ indicates that 0.565, it means 56% of variations of variable "Y" is because of inserted "X" and the rest is related to other "Xs".

ResultsoftestF,Pearson correlation, andregression analysisshow that there is significant relationship betweenhardwareand softwareinfrastructure insmart schoolsandthe possibility of establishing distance education.Then hypothesis H1 is conformed andnullhypothesisH0is rejected.

**Hypothesis 2**

H1: There is a significant relationship between capabilities of teachers and school administrative staff and the possibility of establishing distance education.

H0: There is no significant relationship between capabilities of teachers and school administrative staff and the possibility of establishing distance education.

A - Pearson correlation test

**Table 9**

Pearson correlationTestof Hypothesis 2

| Correlation coefficient | The number of responder | Significance level |
|---|---|---|
| R=/654 | N=120 | α=/000 |

This test revealed a positive and high correlation between the independent variable of the needed capabilities of teachers and school administrative staff and the dependent variable of distance education. Results show that for a unit change in the independent variable, the value .654 unit changes in the dependent variable can be expected. This prediction is bilaterally significant at the level of 99% based on the above test.

B - Regression testing

**Table 9**

Regression testing of Hypothesis 1

| β | Sig. F | F | Adjusted $R^2$ | $R^2$ | R |
|---|---|---|---|---|---|
| 0.654 | 0.047 | 0.054 | 26 | 0.077 | 0.533 | 0.284 |

The above table shows the regression output. According to this table, F test which is the test of approve or reject a hypothesis, is significant at the level of 99% and conforms the relationship between two variables. β is the kind of statistic indicates that 0.284 changes are predictable. $R^2$ represents the identified amount of variable" Y" in relation to the variable "X". $R^2$ indicates that 0.533, it means 53% of variations of variable"Y" is because of inserted "X"and the rest is related to other "Xs".

Results of test F, Pearson correlation, and regression analysis show that there is significant relationship between capability of teachers and school administrative staff and the distance education. Then hypothesis H1 is conformed and null hypothesis H0 is rejected.

**Discussion and Conclusion**

Planning distance education courses in smart schools is one ofthe key elementsofinformation andknowledge basedsociety in field of training. It is affected by rapidtechnologicalchange and requires systemic programming of all elements. As it is obvious from analysis of structures of research variables, both the teachers andthe administrative staff of smart schools (Absal girl high school, Freedom Call girl high school, Dr. Mosaheb boy high school, and worker Martyrs boy high school) insiston asystem approachin administeringdistance education and reject the one-dimensional approach.In thissystemic approachallelements ofsoftwareand hardwareinfrastructure fordistance education insmart schoolsshouldbe present; andtheprovision ofelectronicboardsor set upaspecialized site causeto fail thereachinggoalsofdistance education.Astheconceptual modelreveals, theseinfrastructures have mutually relationship with each other.Hence,it is necessary that the country's education system administrators take in to consideration theintegrity ofelementsof distance education.In our opinion,by considering the requirementsof the information societyand theincreasing demandfor distance educationbydifferent socialclasses,planning andformulation ofrelatedlaws andregulationsshould bethe most important challenginginfrastructure. Then the following cases should be examined: a)ruleson how toevaluatea distance educationdegree; b) rules onhow to establishdistance education(focusedorbydifferent institutions); c) rules concerning thedefinitionofauthority ofinstitutionsinholdingdistance education; d) rulesrelating tothe requirements forparticipation indistance education; e) ruleson how toreform andstate the opinion of teacher; and f) rules regardingonline networksecurity system.

It should be notedthat many of thesocial issuesof educationalaffairsafter administeringtraining programsandthrough observationsandsurveysand feedbackcan be studied.

Through this study three overall results were obtained:

1 - Smart Schools do not have thepotential functionality and capabilityfordistance educationcourses.

2 - It is necessary that the teachers and administrative staff could investigate further the distance education following up its implementation at different levels and in different classes.

3 – With regard to the first case and havingthe potentialperformance ofsuch workandalong withthe progress made inthis area,it is essential thatschoolshave asystematicplanforthedistance educationand with thesystematicand purposefulstances pavethe wayto achieve it.On the other hand, observing the Pearsoncorrelationbetweenthe independent variables, including the capability of teachers and administrative staff toestablish, it is essential that theauthorities ofthe country's educationsystem act toward holding classes to be able better act in continuing toapplythenew teachingmodel.

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