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The Comparative Study of Information & Communications Technology Strategies in education of India, Iran & Malaysia countries

[1]R. Kaabbasi, [2]M. Sabouri Motlagh, [3]F. Masteri Farahani, [4]M. Jalilzadeh Heydarlo

[1]Malayer Branch, Islamic Azad University, Malayer, Iran.
[2]Khoramabad Branch, Islamic Azad University, Khoramabad, Iran.
[3]Central Tehran Branch, Islamic Azad University, Tehran, Iran.
[4]Payam Noor University of Urmia, Iran.

Abstract: The aim of this research is to conduct a comparative study about the development of information and communication technology strategies in three countries including India, Malaysia and Iran. Studied population in this study included different aspects of information and communication technology development strategies in India, Malaysia and Iran. Given the widespread topic, the objectives, policies, and initiatives and innovations were studied in sample countries. Research data was collected based on the study of relevant books, dissertations and higher education graduated ones and other studies, articles published in the available journals, various internet websites, and also interaction with educational experts and then was analyzed by using George Beredy method. Obtained results indicate that the Iranian authorities have been completely successful in applying the remote web-based education and Malaysia has been successful in developing the elementary school students' scientific and practical skills in the field of information technology. Iran has also been successful to a large extent in developing the knowledge borders and access to education beyond the age limits; each of three countries have considered the objectives and policies in order to develop and improve the development strategies of Information and communication technology and some of these objectives are similar in all three countries and others are different according to the specific requirements and based on the abilities, facilities and infrastructures of those countries.

Key words: Strategy, Development, Information and Communication Technology (ICT), Comparative study

INTRODUCTION

Different countries have been considered the education as a major factor of economic and social development and have done considerable efforts in the field of education in past four decades. However, expectations from the education have been increased in the current era and with the beginning of third millennium and the vast technological changes which have been occurred over the past few decades.

Now, many countries have put their efforts into understanding the ICT and emphasizing the skills and concepts and the Information and Communication Technology has been considered as a part of education main core. On The basis, each country, including the developed and developing one, is now seeking to be developed more reasonable and as soon as possible in line with developments in competitions of other countries in the field of making changes and developments in the educational system. In this regard, the countries have taken steps in various degrees and each of them has implemented or is implementing measures in this field. Obviously, no country has been able to perform all necessary actions in the field of information and communication technology development in the educational system, yet. Because the application of "ICT" in the educational system has been recently evaluated and studied compared to application of this technology in other organizations and on the other hand, the application of these technologies in education is more critical than other organizations. Now, according to the great development about the way, through which global competitions have been emerged, we can conclude that each country should conduct a research and study for better and safer future and make itself compatible with the society which is changing rapidly. (Fardanesh, 1993)

Therefore, we should be aware in the field of ICT and study various aspects of information and communications technology simultaneously (theoretical and practical principles). If we can adopt strategies in this regard, we can certainly make the best use of information technology in all areas. Thus, the study of educational systems in other communities can be a way to resolve most of problems. According to what was stated, this issue is raised that what strategies should be adopted for useful application of ICT in education of primary school course in order to put new technologies in the educational system. Unlike the past, when the distinction among the communities was based on four indicators of industrial era (capital, machinery, materials and manpower), in today society, the information is the indicator of power. Nowadays, the amount of information, which a country produces, makes available, or implemented is what puts that country at the first,

Corresponding Author: R. Kaabbasi, Malayer Branch, Islamic Azad University, Malayer, Iran.

second or third level of world. The beginning of third millennium and twenty first century is the real era for the presence of developed information countries (Montazer, 2002).

Nowadays, we are in the path of another development entitled as information and communication technology and should make ourselves compatible with new developments and technologies. This research seeks to evaluate the development strategies of information and communication technology in the education of primary school courses in Malaysia and India and study their differences and similarities and finally provide suggestions in order to model them in the primary school education system of Iran. In fact, the aim of this study is to respond this question that what strategies should be as the bases for information technology and communication development in the primary school education system of Iran?

Research Background:

Ghaderi (1384) has been conducted a research entitled as the development strategies of "ICT" in the educational system of three countries including Australia, America and India and about comparison of these countries with Iran comparatively. The important findings of this research are:

- Australia has taken steps in this way based on the long-term objectives such as preparing the creative students, who are efficient in the use of information technology or the projects including the database for technical and vocational education, international training and resource network and… implemented programs for teachers' qualitative development. This country has also integrated the "ICT" into the program by introducing the exploration schools and Internet development.
- The United States has also done the measures such as national information infrastructure, introducing the virtual high schools and smart classes with the overall aim to prepare students for twenty-first century, a plan conducted as the result of Clinton's command in 1996, in order to develop the "ICT" in the education and has provided the pre-service and in-service programs in order to prepare teachers.
- With introducing the macro-strategy of changing India to the leading power of information technology up to 2008, India implemented plans including the project of computer literacy studies at schools, implementing the ICT at schools, "Head Start" program, smart schools and …. It has implemented the pre-service and in-service programs in order to make the teachers involved in this growth procedure and has run the project of smart schools in order to integrate the ICT into the curriculum.
- With the aim of providing an ICT-based learning environment, Iran has also proposed the projects including the smart schools, Internet buses, Roshd (Development) educational networks and…. It implemented seven-skill ICT courses for teachers' professional development and the plan for provision of electronic content, e-books and pilot projects at schools in order to integrate the ICT into the curriculum .

Rajabi (1379) has mentioned in the results of his own study entitled as "Evaluation the role of a computer in education of Iran", which has implemented for receiving the certification of Master degree from Public Management Education Center in academic year 1999-2000, that:

- Iran has a very primitive state of computer use in education and because the teachers and managers in the educational centers have no experience in making the good use of this media for educational purposes, the necessary facilities are not provided for students' use in the educational environments.
- The public and private institutions do not provide educational software due to the non-application of educational software.
- Conducted studies indicate that most of the teachers, students and families are interested in the use of computers in educating different lessons in different educational courses.
- Male and female high school students have more willingness to use the computer in mathematics and physics courses. At secondary school, the science course rank is after the Mathematics.
- Students are now more familiar with the computer use than the teachers.

(Andrew A. Flak quoted by Nida Abdollahi, 2005) has conducted an international survey about the Information and communication technology in education in his doctoral thesis in 20 December 2003. This study has mentioned that: Continued development of technology has led to a situation in which the practice and policy have major differences with each other. Literature concerning the development of technology and logic in using the ICT at schools has taken the effectiveness and professional improvement of teachers into account. Existing models of development in this area have limited range or are made based on the baseless hypotheses. Few studies have been done in the field of correlation between the policy and practice. In this study, a reasonable theoretical approach has been applied in order to evaluate the correlation among the policy, implementation and basic models of development. This method has been done through the process of comparing the policy, consultation with relevant experts and case study observations. A comparative case study approach at the national, school and classroom level has been used in the methodology of this study and the issues such as the nature and development processes for policy in the area, implementation and realization of computer use plan in the classrooms, teachers' professional and occupational growth and the development stages based on the teachers' viewpoint have been investigated. Data related to the study were collected from the countries including the United States, Britain, Estonia and Australia from the November 1999 to September 2002. The results of this

study indicate that the ICT curriculum approaches for students has a strong and close correlation with a development stage which emphasizes the integration of ICT in the existing educational programs and the class activities. Moreover, a weak correlation was observed between the common policies for educating teachers and the outcomes of students' learning and also between the policy and its implementation in the classroom. This study confirms this point that the students generally have better and more access to the computer outside the school than at school and this is a situation which the educational policies often ignore. Furthermore, it is observed that the experts of this field consider the increasing use of software Office as an old tool approach and the ICT as a stimulus for creating fundamental changes in the basic school system. Observations made at school and in the classrooms have confirmed that the activities of schools contain the ICT applications.

A possible general model has been obtained from these findings for the development stages. This model consists of three stages: At the first stage (Preliminary stage) the students use the computer at school for the first time and the communication technologies becomes as an elective course; the second stage (combined stage) uses the Information and communication technology in order to increase the learning opportunities in all educational areas of traditional curriculum and at the third stage (Conversion stage) the curriculum contains clearly the studied issues (which were without the Information and communication technology) and ultimately, the education is not consistence for most of the students with the traditional model of group teaching.

Research Questions:

1- What strategies have been adopted by the sample countries in the field of information and communication technology development in the education of elementary course?

2- What are the differences among these kinds of strategy?

3- What are the similarities among these kinds of strategy?

Research Method:

Research method in this study is a descriptive approach based on the comparative analysis and according to one of the most prominent researchers in comparative education "George Beredy", this method involves four stages:

A) Description stage

B) Interpretation stage

C) Proximity stage

D) Comparison stage (Aghazadeh, 2006)

Data Collection Method:

- Study of documents and records existing in the libraries;
- Evaluation of reputable online websites and receiving the information from them;
- Utilizing the experts' expertise viewpoints via the e-mail

Research Findings:

First question: What strategies India, Malaysia and Iran have been adopted for development of Information and communication technology in the field of cost and equipment?

A) India:

- **Strategies of Information and communication technology development in the field of national policy:**

- Immediate efforts to create the infrastructures for achieving the IT world classes in India;
- Emphasis on the IT exports in order to make India prominent as the original pioneer in development of software and the relevant fields;
- IT for all people up to the year 2008
- 10-time increase in the computer penetration rate speed
- Access to the global educational resources
- Preventing from the international assistants and supporting the projects related to the ICT education in the country.
- Standardization of plans for applying the computers in curricula of schools and taking steps in a way which considers the information technology as a part of education process in the educational system.
- Designing the flexible models of curriculum which are coordinated with the latest technology.

B) Malaysia:

Development Strategies Of Information And Communication Technology In The Field Of National Policy:

- Making the all students familiar with the basic concepts of information technology such as the Internet as the life tools

- Applying the educational software in the curriculum of all levels of education
- Increasing the communication between the schools and today world
- Enriching the resources of classrooms
- Developing the educational resources compatible with the information formats
- Public access to the education by utilizing new technologies
- Upgrading the individuals' skills in using the information technology
- Using the information technology as an educational and educational assistance tool for enhancing the education and learning level

C) Iran:

Strategies of ICT development in the field of national policy:

- Contributing to empower the individuals for independent learning;
- Contributing to develop the learners' creativity through the self-learning and self-research;
- Providing the appropriate transition fields from the teacher-centered to learner-centered education through organizing the teaching-learning process;
- Providing the appropriate background for sustainable development;
- Developing the borders of knowledge and access to education beyond the age limits;
- Empowering the learners to reach their own leadership skills in learning with the help of IT

What Strategies India, Malaysia And Iran Have Been Adopted For Development Of Information And Communication Technology In The Field Of Initiative Plans?

A) India:

Strategies for development of information and communication technology in the field of initiatives and plans:

Plan of Smart Schools:

Schools, which support the students' learning and skills with the infrastructures, programs, tools, teachers and administrators and are helped by information and communication technology, are smart schools. The role of information technology in the education, training and development and human resources is well known in the IT task plan by the Indian government or state. This is a plan of smart schools in India and classifies different data which should be considered in building smart schools: School readiness and its management, changing the teachers' role and teachers' need for training, changes in routine curriculum including the training and assessment and supports of technology needed for smart schools; this plan is a very important structural element in IT task plan in 1998 and is a tool for making the system of schools consistent with the future changes; moreover, it will make a significant use of ICT. Following the recent changes in information technology, the smart schools have been established in some of the states.

Vidya Vahini plan:

This program aims to strengthen the IT power and education through a coherent approach and thus to strengthen the teaching- learning processes. This program provides the technology facilities at schools, makes a regular curriculum available for the school and trains the teachers in order to make the use of technology in their own teaching and learning processes and implements the k-10 regional programs, which covers 30000 students, for approximate 770 schools including 30 urban and state schools (Ministry of Education, India, 2002).

Head Start plan::

A special group for primary education of tenth five-year program has recommended that one or two schools from each region of country should have facilities for computer-based learning so the children will be able to utilize from surrounding schools. Continuity of these educations and instructions as the educational integrations helps to promote the participation in the infrastructures. Two main tested models in training the computer IT at the elementary level include A) "Head Start" Program in Madhya Pradesh and Chhattisgarh, B) "Communication learning center" by non-governmental organization in Karnataka.

Head Start is an initiative plan to promote the quality of education through the use of IT and to fill the digital gap. It expands the CD lessons on the "Hard-Spots" and knowledge part. Now, 648 schools of this state are active and the government of Madhya Pradesh has decided to expand this program at other 866 schools. In Head Start is also active in 271 counties of Chhattisgarh state.

Shiksha Project:

Shiksha, which means the training and education, talk about the students' ability and knowledge in learning methods and affects their lives considerably. The objective of this project is to accelerate the increase of

computer use knowledge in order to provide an ultimate solution which includes the software solutions and training and helping the education understanding by teachers and students.

Karnataka Project At Primary Schools:

This is an adjoint project between the government of Karnataka and Azim premji foundation and aims to demonstrate the basic technology such as the use of software power in the certain mathematical, geographical and environmental aspects. The objective of this plan was to enhance the motivation and stimulation of students for introducing the computer to them and increase their attention to the computer.

Mobile Classes Projects:

IT buses in the suburban areas of India cities (Rural areas) and using these changeable buses to the classroom have expanded the IT knowledge among the students in rural areas. The initial investment was a million dollars for purchasing the computer systems, teachers' wage, and purchasing the buses which can be changed to the mobile classrooms.

B) Malaysia:

Strategies of ICT development in the field of innovative plans:

1 – Plan of equipping the primary schools with the Information Network:

Based on the plan of equipping the primary schools with the Information Network Students, 700 primary schools in Malaysia can communicate and exchange the information with other counterparts at other schools. In other words, the students will be able to communicate through an information network which connects them to other schools. According to the statement of one of the managers in the education network of Kuala Lumpur Information Center, during the year 2001, the local government provided over 75000 computers for hundreds schools and thus there is a computer per 10 students at some of the schools. In general, it can be said that so far over 8 million and 400 thousand dollars have been allocated for establishing 19 information planning centers with specific software.

2 - Plan For Establishing The Internet Network At Schools Of Country:

The students at over 1000 schools of country are now taking advantage of access to the target educational information through the Internet network. According to the statement of Education Commission, currently, the role of computer and education through the Internet network has become so important and been increased at schools and the government has held classes in the field of information technology at all schools of country. Accordingly, most of the primary schools of country, specially the schools of Kuala Lumpur city, have the computer room and a tenth local schools also have at least 1 computer per 10 students. According to the educational programs of country, up to the year 2005, the primary schools will provide the educational programs via the global internet network. So far, 90 schools of Kuala Lumpur city have held test centers in order to create the new technology and education system. New and official statistics of Malaysia indicate that over eight million Malaysian citizens have the Internet subscription and 56 percent of those are under the age 24. It should be noted that Kuala Lumpur city has the largest Internet subscribers in the country.

3 - Plan of Education Through The Computer:

According to the declaration of central government of Malaysia, the education, through the computer will be begun across the country up to 2010. While, Kuala Lumpur city, as one of the largest commercial and economic areas of Malaysia, has educated the students through the computer, so that all primary and high schools of this city have provided digital educational programs up to 2005. According to the declaration of Malaysia education, the computer course is as a main course like the Mathematics, Malaysian language and English courses. Of information technology will be also introduced for improving the educational quality along with the traditional system. Moreover, the classrooms are held without books at some of the developed schools. Up to the end of the year 2000, 23 thousand computers, which allocate 15% of total computers across the country, have been applied at schools. So far, 450 laboratories and 220 computer stations have been set up and at some of the Kuala Lumpur schools, the guidance program through the computer has been implemented successfully.

4 - Plan Of Educating The Computer At Primary Schools:

Ministry of Malaysia education is determined to develop the computer training at primary schools throughout Malaysia within 5 to 10 years from the year 2001. In this regard, 750 primary schools provided the computer training programs up to the end of the year 2005. Now, the Computer courses are taught at more than 750 primary schools of Malaysia. In Malaysia, there is a computer per 10 students on average and 300 thousand students from the whole number have passed the computer training courses.

C) Iran:

Strategies of ICT development in the field of innovative plans:

1– Project of developing the national network of Iranian schools [Roshd (development) network]:

The objective of this plan is to provide an environment for interaction of all people related to the education and create an environment for connecting all education centers together.

2 - Pilot Project Of Electronic School:

The stages of project includes equipping the popular schools to the necessary hardware and software facilities, providing platforms required for e-learning, providing the educational content for students, educating teachers and students, implementing the system and evaluating different parts of electronic school.

3 - Plan Of Equipping The Schools And Training Centers To The Computer Lab And Network Connection

It has been started from October 2001 and the Organization for Research and Educational Planning manages it.

4 - Training The Teachers, Students And Other Education Personnel Based On The Information Technology:

Training the computer application- Training the professional literacy- Training the planning experts and writing the textbooks - Training the technology authorities of school - Training the students

5 - Takfa program [Information Technology Application Development (ITAD)]:

Providing the infrastructure including the access network, Laws and Provisions, Resources and Facilities- Comprehensive program of ICT development in the National Sustainable Development- Considering the private sector as the main axis of ICT development - Human Resource Development as the strategic priority of ICT expansion

Second Question Of Research: What Are The Differences Among These Kinds Of Strategies?

Table 1: Differences in strategies of ICT development in the field of policy:

Countries Case	India	Malaysia	Iran
Policy	- Making efforts to create the infrastructures for achieving the IT world classes in India - Emphasis on the IT exports; - IT for all people up to the year 2008 - 10-time increase in the computer penetration rate speed - Access to the global educational resources - Supporting the projects related to the ICT education in the country. - Applying the computers in curricula of schools - Designing the flexible models of curriculum which are coordinated with the latest technology.	-Applying the educational software in the curriculum of all levels of education - Increasing the communication between the schools and today world - Enriching the resources of classrooms - Developing the educational resources compatible with the information formats -Upgrading the individuals' skills in using the information technology	- Contributing to empower the individuals for independent learning; - Discover and develop the hidden talents by creating the educational second opportunity. - Contributing to develop the learners' creativity through the self-learning and self-research; -Creating appropriate background for knowledge cycle in the society - taking advantage of information capacities of country for providing the right of education for all people; - Developing the borders of knowledge and access to education beyond the age limits;

Table 2: Differences in strategies of ICT development in the field of initiative plans:

Countries Case	India	Malaysia	Iran
Initiative plans	- Smart Schools plan - Vidya Vahini program - Karnataka project - Head Start plan - Shiksha project - Mobile classrooms project	- Plan of equipping the primary schools with the Information Network - Plan for establishing the Internet network at schools of country - Plan of Education through the computer - Plan of educating the computer at primary schools	- Project of Roshd (development) network - Pilot project of electronic school - Plan of equipping the schools and training centers to the computer lab - Takfa program[Information Technology Application Development (ITAD)]

Third question of Research: What are the similarities of these kinds of strategies?

Table 3: Similarities in the strategies of ICT development in the field of policy:

India	Malaysia	Iran
- Emphasis on equipping the elementary schools with ICT facilities. - Developing the primary school curriculum based on the new technologies. - Continued education without time and place limit with emphasis on the primary education. - Emphasis on empowering the primary school students in integrating various sciences. - Reducing the digital gap.		

Table 4: Similarities in the strategies of ICT development in the field of initiative plans:

India	Malaysia	Iran
- All three countries have conducted plans and innovations in the field of using the information and communication technology and its development in the teaching - learning process. - In all three countries, the objective of implementing these projects was to fill the digital gap. - In all three countries, private institutions are active in the field of creating and implementing the projects related to the ICT. - All three countries emphasize on the teaching array based on the implemented plans.		

Discussion and Conclusion:

The results indicate that the objectives of studied countries in the field of information and communication technology applications in education are resulted from the objectives of education in those countries and in line with modern education and optimum use of these countries from new technologies in education. On this basis, the objective of Malaysia is the access of all elementary schools and primary high schools across the country to the computer facilities up to the year 2010 and connecting 90 percent of these schools to the high speed Internet network; however, the basic objective in India is to design new curricula based on the information and communication technology and the basic objective in Iran is to increase the power of scientific competitiveness with the global group of science and knowledge.

Difference of these strategies in the field of national policy is largely as the result of education overall objectives and these objectives should be based on the system of society values and consistence with the cultural, social and economic needs and conditions of that society, thus priorities of achieving each of these objectives are different for each three countries. For instance, Malaysia is seeking to set up two computer networks among the schools and connect all elementary school to these networks and make public access to the education by taking advantage of information and communication technology, while India implements the development of ICT facilities in the training centers with emphasis on the modernization of schools and Iran is seeking to empower the primary school learners to use the ICT.

Plans and innovations which are implemented in the field of development of ICT in studied countries have been as the help for ICT in order to achieve the objectives of education these countries and each country has designed and implemented its own plans and innovations with considering the capabilities, facilities and infrastructures and has been successful in implementing those plans and innovations and consequently the desired objectives. Projects with different qualities have been implemented in the field of digital gap between the rural and urban students in each of three countries. In Malaysia, the plan for connecting all elementary schools to the global Internet network is implemented widely and in India, Head Start project is looking for a free local information training system by which the end users such as teachers, students or their parents have easy access to the high quality education information through the computer connections. In Iran, equipping the schools with the ICT is the major priority of Ministry of Education.

- Similarity Of These Strategies In The Field Of Policy:

There are common objectives in the field of general objectives and priorities and priorities of ICT development among three countries, Malaysia and India and Iran. The objectives, such as creating the education opportunities for all people, helping to reduce the costs through applying the Internet, continuous education without time and place limits, use of new tools and methods in education, increasing the teachers' knowledge in the field of ICT, training and providing the experts needed for the society, reducing the digital gap and training students in ICT so that they will be able to identify the limitations and facilities of information technology and apply them in their own life, are among the priorities of all three countries for developing the information and communication technology.

- Similarity Of These Strategies In The Field Of Initiative Plans:

Plans and innovations in the field of using the ICT and its development in teaching-learning process have been conducted in all three countries.

In all three countries, the private institutions are active in the field of creating and implementing new plans of educating the learners in ICT.

In all three countries, these plans are done for filling the digital gap.

In all three countries, attention to the students' empowerment in using the ICT facilities is significant.

Suggestions Based On The Research Results:

- Providing required facilities for participation of private sector in the ICT-based trainings.
- Acceleration and development of equipping the schools and training centers with the Internet which is partly done and is passing an appropriate process.
- If we are seeking for an optimized use of ICT-based training, we should not be hasty, but we should first provide the required assumptions and infrastructures .
- Taking advantage of qualified personnel or at least with the knowledge of computer as the consultant at schools in order to better and faster carry out the culturalization process in the field of applying the computer and Internet.
- Modifying and completing the telecommunications projects and solving the problems of defects of server which is dependent on the general policies of the country.

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