

Review

New Trends in Teacher Training and the Place of Information Technology in Education

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Abstract

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Educational institutions fall under open systems category due to their close interaction with the social structure and its environment. As in every system, among the components of the education system are inputs, process, outputs, feedback and “environmental” subsystems that closely interact with it. As for “process”, a subsystem that has a lot of transactions, we see a cycle set on four pedestals including “administration”, “teaching”, “cultural” and “political.” Reports prepared as a result of comprehensive research conducted by international institutions and organizations state that teachers who constitute a critical axis of the education system play an important role in student academic success along with other axes. Thereunder, reports prepared as a result of research focusing on selecting, training and developing teacher candidates, quality of education and improving student success have come up with some recommendations. While education is being redefined as a structure and process in addition to being a system, the components of education undergo a structural transformation. While educational institutions and organizations are put at the center as a basic change and transformation element of the social structure in our information age, student has begun to be re-defined as “strategic human resource” and teachers as “strategic teaching leaders.” The present study deals with the new trends in selecting, training and developing “teachers” which are a sub-dimension of the “Educational Process”, and thereunder, the increasing importance of the information technology and its possible contribution to the training and qualifications of teachers, and seeks to come up with some recommendations.

Keywords: Educational process, Teacher Training, Information Technology, Strategic Human Resource, Strategic Teaching Leaders

INTRODUCTION

The school reforms that began especially in the late 1990s focused on teachers and education programs. The research by pedagogues found that teachers, when taken with other components, other than students’ genetic

characteristics, had the largest share in academic success. The research findings show that genetic predisposition accounts for 50% of the student academic success while teacher quality accounts for 30% thereof

(Hattie, 2009, as cited by MoNE, 2010), The total share of other factors affecting academic success is around %20. Such research points out that the main area that requires investment in order to be successful in education and train the required manpower with required qualities and in required quantity are teachers.

The main conclusion derived about the education systems is that the success and quality of the education system will not exceed that of teachers. Teachers that are the cornerstones of this success must be selected with a systematic approach, trained and developed according to the requirements of the information age, their continuity must be ensured, they must be equipped with qualities for educating the next generations that will change and develop as well as following up the changes and developments that are inevitable in our age.

METHOD

The present research is a descriptive study and uses the qualitative research method. The population is the OECD countries. Data was collected by "literature review", and data resources used are national and international research and study reports, databases of international organizations primarily including OECD, new approaches and research reports on teacher training, assessment reports on educational technology, and strategy documents on teacher training and the use of information technology in teacher training. Data collected was analyzed using descriptive analysis techniques. With the data obtained, a framework was created for descriptive analysis, data was processed according to the thematic framework, findings were defined and interpreted to reach a conclusion.

DISCUSSION

The teachers are the cornerstones of the school reforms. The researcher pedagogues point that teachers have the biggest share in student academic success. Education managers have taken care of these results and realized that the quality of education cannot be improved without qualified teachers. So they have made main part of investment on teachers.

Although it is a beginning to be aware of the fact that teachers are the leading factor in the development of the education system, respective practices must also make this fact felt. Hence, countries that aim to achieve their development by a well-educated manpower, and therefore, to develop in education try to improve the quality of teacher training and increase the reputation of the profession starting from the selection of teacher candidates.

The present research first deals with the new approaches in teacher training followed by the use of information technology in teacher training.

While exploring the new approaches in teacher training, it would be more proper to establish the role of teachers in education system and present the respective findings of the relevant research. A research on students who were successful at PISA exams reports that there is a very good relationship between these students and their teachers. The ratio of students saying that they are in a good relationship with their teachers is 85%, and that of students saying that they immediately access additional teacher help when they need it is 79% (OECD, 2010). The use of the means of the information age, teacher's good command of this technology during their training to achieve the required level of communication with students who can use the technology very well since early ages and also teacher training by using this technology at maximum is also critical for achieving a healthier and continuous teacher-student relationship.

Country-specific approaches in teacher training mostly shape around their economic, social and political approaches (UNSECO IIEP, 2006 p. 12). Thereunder, there are four main factors that influence teacher training programs including high standards in candidate selection, a preparatory program with a strong content, a good pedagogical education and comprehensive teacher training program (UNESCO IIEP, 2006, p. 14).

Finland, as the undebatable leader in PISA tests, has exemplary practices in teacher selection and training system, increasing the interest in teaching profession and ensuring the reputation of teachers in the society. The primary reason for the success achieved by Finland is the teacher training program (Simola, 2005, as cited by Çobanoğlu & Kasapoğlu, 2008). The most important characteristic of this program is to accept only highly motivated and talented students into the program at the beginning to keep the quality of education constantly high (Malaty, 2006, as cited by Çobanoğlu & Kasapoğlu, 2008). Only an undergraduate degree is not considered adequate for teacher candidates and a graduate degree is required to become a teacher. To achieve the desired quality in teacher training, it is an inevitable fact that the requirements of the current information age are followed and the technology is used at maximum (OECD, 2019).

A study was conducted by OECD with the participation of 23 countries that achieved the highest scores at PSA exams to improve the quality and success in education. The study found that the most important elements affecting success were teachers and school administrations, and a report was prepared on things to do to train teachers better for the 21th century (OECD, 2012).

The study derived the following results about increasing the teacher quality.

- a. The most important method of improving student performance is improving teacher quality.
- b. Generally, in determining teacher quality, its contribution to student performance must be taken as basis.
- c. Contributions a teacher will make to the school must be defined, and an optimum teacher-student combination must be achieved in class.
- d. Researches show that parents pay importance to teacher quality in school selection, which will improve student performance.
- e. Quality teachers have been found to improve student performance at least by 4% on annual basis.
- f. Quality teachers appear to be a factor that compensates for other deficiencies of the school to some extent.
- g. Reforms aimed to improve teacher quality must have very clear, attainable and realistic goals.
- h. Current laws, rules and policies directly affect the improvement of teacher quality.
- i. Fixed-term teacher contracts are not effective in improving student performance.
- j. Rewarding successful teachers has a positive contribution.
- k. Many schools follow a systematic model to ensure high quality. They regulate the qualifications of a quality teacher and the functions of the school by this model.

In the research report, some main criteria have been identified for teacher assessment. These are;

- a. Thinking Methods: Creativity, Thinking in Critical Situations, Problem Solving, Decision Making, Learning.
- b. Working Methods: Communication and Collaboration.
- c. Working Tools: Information Technology, Communication Technology, and Information Literacy.
- d. Skills Required to Live in the World: Citizenship, Life and Career, Personal and Social Responsibilities.

The work discusses the dimensions of education in the 21th century and groups them under 4 headings. These are Knowledge, Skills, Personality and Learning to Learn. Innovative learning environment to be created by teachers is also defined. Basic factors to be taken into consideration by teachers while creating this environment are:

- a. Putting learning at the center, encouraging participation, motivating students to learn,
- b. Procuring the adoption of learning as a social and collaborative activity,
- c. Providing student with high motivation,
- d. Being sensitive to individual differences,
- e. Being directly involved in every student,
- f. Using feedback for assessments,
- g. Establishing a connection between scholastic and extra scholastic projects and activities,
- h. Using different learning methods, developing special strategies for certain subjects,

- i. Developing teaching strategies,
- j. Ensuring that teaching strategies encompass methods that are direct, aimed for the entire group, serves as a guide, aimed for group work and personal for individual inventions,
- k. Being ready for a high cooperation standard and to work in cooperation with other teachers,
- l. Having skills to use high technology,
- m. Developing cooperation, leadership, management, learning environment planning, and collaboration with others,
- n. Practicing to develop experiences.

The work also discusses the dimensions of education in the 21th century and groups the dimensions of teacher training under 4 headings. These are Knowledge, Skills, Personality and Learning to Learn. Under the innovative learning framework created by teachers, having a good command of the information system and technologies and the ability to use these systems in education have come to the forefront as an important factor. Basic factors to be taken into consideration by teachers while creating this environment are:

- o. Putting learning at the center, encouraging participation, motivating students to learn,
- p. Procuring the adoption of learning as a social and collaborative activity,
- q. Providing student with high motivation,
- r. Being sensitive to individual differences,
- s. Being directly involved in every student,
- t. Using feedback for assessments,
- u. Establishing a connection between scholastic and extra scholastic projects and activities,
- v. Using different learning methods, developing special strategies for certain subjects,
- w. Developing teaching strategies,
- x. Ensuring that teaching strategies encompass methods that are direct, aimed for the entire group, serves as a guide, aimed for group work and personal for individual inventions,
- y. Being ready for a high cooperation standard and to work in cooperation with other teachers,
- z. Having skills to use high technology,
- aa. Developing cooperation, leadership, management, learning environment planning, and collaboration with others,
- bb. Practicing to develop experiences.

The work report suggests some main criteria for teacher training in line with the regulations regarding teacher training stated above. According to the said report, during their training, in accordance with the requirements of the information age, teachers must be trained in

- a. Thinking Methods (Creativity, Thinking in Critical Situations, Problem Solving, Decision Making, Learning),
- b. Working Methods (Communication and Collaboration),

- c. Working Tools (Information Technology, Communication Technology, Information Literacy)
- d. Skills Required to Live in the World (Citizenship, Life and Career, Personal and Social Responsibility), and attain such level as to contribute to the success at maximum.

In teacher training, there appear to be different practices in the use of computer and communication technology in the developed countries to achieve the goals summarized above. In Japan, a profession called “educational engineering” has developed along with the studies on information technology. This profession works on developing teaching plans, transferring educational knowledge and techniques and particularly developing high-quality educational materials by using information technologies (Sakamoto and Gardner, 1995, as cited by Demirel, 2010).

In the British education system, computer and communication technology (CCT) is of special importance. The duty of the CCT is to motivate students and thereunder teachers for success, contribute to the making of education more fun, developing their creativity, assertiveness, independent thinking skills, and helping them to inquire and solve problems (Demirel, 2010, p. 161).

The main idea of using computers in class is to further improve teacher's communication of knowledge to students and facilitate their access to the remote students (Chapman & Mahick, 2004). This main idea is applied in the training of teacher candidates, and teacher candidates are also required to learn how to use the technology effectively to achieve the above goals. Technology facilitates communication and also expedites and cheapens the access to resources. While the initial technologies make the training method used by teachers in the class more effective without changing it, new technologies force and encourage teachers to develop new methods.

The Paris Open Educational Resources Declaration-OER signed in 2012 can be regarded as a significant step at this point. It is noticeable as a project that will encourage both teachers and students to use more technology to access educational materials. In the report prepared by OECD as a result of the TALIS exam, 25% of the teachers stressed that the use of technology-based methods should be given more importance in education (OECD, 2009, p. 61).

In education, technology is used in seven main areas effectively. Teacher candidates must be trained in such manner as to use the CCT in such areas effectively. These areas are:

- a. Reaching students in different locations directly via the Internet-based systems,
- b. Expediting teachers' finding and accessing course materials,

- c. Facilitating teachers' access to class programs and training guides,
- d. Facilitating students' access to resources necessary for their class research projects,
- e. Enabling teachers to teach two or more classes anywhere in the world at the same time and facilitating their communication,
- f. Enabling teachers to teach online in multiple classes concurrently,
- g. Facilitating teacher in-service trainings (Chapman and Mahick, 2004).

The CCT provides the above opportunities and also facilitates teacher candidates' logical thinking, improving their research skills, presenting and sharing the knowledge they acquire. The CCT helps teachers conduct some experiments in a safer environment and do mathematical computations error free and faster and thus contributes to their better training. In creating and following up a curriculum, it is possible to minimize the risk of making a mistake, which is part of human nature, by making the calculations with minimum error using the CCT even in the system that have many classes and instructors. The CCT, with the means it offers, has come to such a level as to contribute significantly to all trainers primarily including teachers not only in the class management but also in the school management and the management of the education system in all aspects, and continues to develop at an unprecedented pace.

The CCT has become an inevitable tool for education systems because it transfers the new knowledge and techniques to not only teacher candidates but also teachers working across the country quickly, allows for remote education, facilitates in-service training and requires minimum change of location while doing all these, and enables acquiring knowledge first hand and saving from resources. Educational inspectors also use the CCT to inspect the class activities remotely and thus save from time and have the opportunity to guide more teachers.

Despite the means offered by the CCT, a research conducted in Germany found that the ratio of teachers who used technology effectively was around 10%. This ratio observed in a developed country is quite noteworthy. When the reasons were researched, it was found that there was a lack of motivation among the teachers and that teachers did not consider computer as a reason for changing their teaching method (Chapman & Mahick, 2004, p. 34). This finding also reveals that, in addition to the importance attached to technology in teacher training, teachers must be motivated to use technology and that a strategy must be developed to explain its importance better.

CONCLUSION

Schools that, as an open system, constitute the basis for a formal education system have been operating under different names since the beginning of social life. Improving one of the outputs of school system i.e. student success is possible by quality education. Reports prepared as a result of international exams and other research on education have shown that the factor that contributes to success the most compared to other factors is teachers. What must be taken into consideration by education administrators and those who prepare educational strategic plans and goals and projects in line with these strategic plans in order to improve the success and maximize the output of the education system is training teachers well and thereby improving the quality of education.

In addition to being a social system, the education system is a basic system that prepares the manpower for other social systems (Law, Economy, Politics, Security etc.), ensures the communication of the culture to the next generations and ensures the continuity of the society. The success of this system is the success of the society. Teachers that are the cornerstones of this success must be selected, trained and developed with a systematic approach, their continuity must be ensured, they must be equipped with qualities for educating the next generations that will change and develop as well as following up the changes and developments that are inevitable in our age.

While training teachers, they must be made to achieve a level that will provide maximum contribution to education and success in accordance with the requirements of the information age by training them in Thinking Methods (Creativity, Thinking in Critical Situations, Problem Solving, Decision Making, Learning), Working Methods (Communication and Collaboration.), Working Tools (Information Technology, Communication Technology, Information Literacy) and Skills Required to Live in the World (Citizenship, Life and Career, Personal and Social Responsibility).

In achieving the above, the importance of the effective use of technology increases each passing day. Teachers must be trained as technology-friendly and in such manner as to use technology well. A consciousness must be fostered among teachers that technology will improve

the quality of education, contribute positively to the student motivation, and contribute to the education of students with accessibility difficulties, that effective use of technology will reduce the educational costs, that teachers with a good command of technology will play an important role in creating a manpower of such quality and in such quantity as needed by the development plans and who can use technology well. Unutilized capacity and negative effects caused by the ineffective use of technology, which has been introduced into the education system at the expense of significant resources, due to teachers' inability to use it should never be ignored.

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