

## Design of Education Environments in 21st Century's Schools

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**Abstract:** Education environments have undergone a radical change in the transition period from agricultural societies to industrial societies. In this period, education has evolved from being a skill which is acquired by a particular class in private environment to the process of getting education and training in classroom environment of wider massive social groups. With the development of science and technology, transition from industrial society to information society took place during the transition period from the 20th century to the 21st century. At the same time, a great number of the people who lived in this period began to live in large urban environments. In this period, both the content and the methods and environments of the information were inevitably exposed to change. An educational approach that focused on horizontal relations and students is developing and wide spreading instead of an approach that focused on vertical relations and teachers. In the light of the new approaches developed in this paper, examples of how education environments differentiated in the rapid urbanization process will be discussed.

**Key words:** education, change, 21st century, society, student, school

### 1. Introduction

It is obvious that change is inevitable for the social and physical environments created by people as well as for the physical world since people were always integrated and appreciated with places in educational activities throughout the human history. History shows that societies have thought and developed different places suitable for the purpose of educational systems and programs in certain periods as a result of scientific and intellectual studies.

Hence, with the industrial revolution, houses, schools and new factories were created in the form of environments that support massive education systems. Nowadays, schools and offices seem to transform the today's learning environment for young people in order to provide a disciplined workforce for the digital and communication revolution. Accordingly, the change is accelerated in other areas. Thus, reorganization of education environments will play a significant role in the future learning — in economy, in demography, in social and cultural life, in government policy, in management of education and pedagogic developments.

For this reason, we need to develop a coherent perspective for the future by reviewing learning objectives as a necessity of rapid change in learning environments. Creating a trained and disciplined workforce can be seen as a

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tool for economic development. Being effective in education and activating people is necessary more than ever. Thus, learning should develop offering creative new experiences confidently, defending against foreign ideas and changing circumstances, and — in a broader sense — it should also develop society and shared sense of responsibility and cooperation.

## **2. Factors That Effect 21st Century's Education Environments**

Today, we see that education has become an important phenomenon as never before. Accordingly, education environments and integrity of education has also become significantly important since information and human needs are changing quickly and new expectations are emerging. So, available living organisms, land, sea and atmosphere resources in the ecosystem that people benefit from must be managed in such a way as to be able to co-exist. At the same time, it is expected that ecosystems and species should be together in such a way as not to jeopardize the integrity (Altuntaş, 2012).

There are many factors and elements that pioneer the change in education. Government policy, technology which effects the change in learning environments, changing pedagogy effect, economic necessities, social trends and even the physical environment are the main factors. Therefore, it should be considered that there is a complex interaction between place and physical environment. According to this report, issues such as education policy, social policy and even urban and housing policy have a very important effect on school. For example, information access facilities and access technologies consist of government policy resources, and these supports are necessary to meet the needs of people with disabilities and young people with special educational needs.

Teachers are increasingly no longer the only educators in schools. Learning increasingly takes place in other environments, and links with external agencies and visits to gain work experience are inevitable. Classroom assistants, learning mentors, students, parents, governors, inspectors, supervisory and administrative staff, and artists in residence are all part of the scene. More attention is given to individual learning needs. In the future, students will need to take more responsibility for their own learning, and educators will need to monitor and support individual learning programmes, whilst at the same time ensuring motivation, stability and continuity. Increased space needs for administration, health and safety requirements, disabled access, storage, special facilities and specialist equipment are also impacting upon the learning environment (OBE, 2002).

Day by day, the economic requirements are also increasing because of the proliferation of technological tools. Businesses need people with skills of creativity and it is expected that the workforce will be able to adapt to new situations and able to learn new skills. In addition, the move from productivity to creativity will encourage a different view of the learning environment. Inter-connected work, social and recreational places will impact on learning environments, with students using digital and telephone technologies for close interaction. Freelance and home-working influence the nature of learning environments. New ways of working will demand qualities of self-motivation, independence, self-reliance, flexibility and adaptability as well as organizational, entrepreneurial and practical skills. Multi-purpose environments that can accommodate work, family life and educational activities will be required, where it will be possible to share costs and responsibilities (OBE, 2002).

With increasing pressures on parents to work, schools are increasingly taking on responsibilities for pre-school and after-school childcare. In an age dominated by the car, the television and the computer, and because of adult fears that children may be harmed or abducted, children in western societies are being increasingly denied access to the outdoors. However, this reduction in contact with other adults and children can

result in a loss of learning. Parents increasingly look to schools to be safe and secure environments that can protect their children from what they see as an increasingly threatening world. Although this may be difficult to achieve in many urban settings where communities are dynamic. For this reason, it may be necessary to provide new age groups to schools for social interaction (OBE, 2002).

New technologies that have been rapidly spreading in the 21st century have become an important accelerator for change. At the same time, these technologies provide many different ways to change education environments. Use of home-based work computers, personal computers and phones probably might not completely eliminate the impact of the school but it can greatly reduce that impact. Young individuals are now surfing on the internet more, they can access every information and institution, have lectures, conferences, and online publishing works in electronic environment with virtual libraries and teachers. While individuals need more face-to-face communication with other people in classical education environments, face-to-face communication has become a less effective way of teaching with computer use. In order to fill the information gap of the people, new learning environments, libraries, learning centers and cyber cafes are emerging in society.

### **3. Outcomes of Changes in Learning Environments**

Today, both school environments and houses have changed significantly with the influence of all these factors. Consequently, learning environments are also changing. In the twenty-first century, we are mistaken if we accept schools as places where only learning take place and teachers as only person who support learning. For that reason, emerging models of learning environments must adopt a flexible approach to innovation, creativity and management. Individuals who share less learning experiences and activities need more than a building as a community. It is time to think about a different school and education environment. As a consequence, schools should offer a broader range of educational experiences for a longer period of time, for students and even for different groups.

In twenty-first century social and individual goals and expectations are changing. It has become very difficult to catch up with the pace of change. In order to meet those expectations, it has become inevitable to develop new learning models and learning environments. The characteristics of innovative and experiential learning models which develop day by day contrary to traditional learning models can be expressed as follows:

- Information should be shared interactively with other users at any time.
- It should be a multi-purpose education area, not just for a specific profession.
- It should be an extremely disorganized type of accommodation that has no certain standards.
- Education is now a fact beyond the school (out of the school's control).
- An unrestricted, adaptable and portable flexible infrastructure is expected.
- Education is focused more on individual and student than society's expectations.
- Lifelong learning which is independent of a specific period of time should be adopted.
- There are flexible subjects; subjects and areas of professional work are vast.
- Works are extrovert; students aim non-school connections and partnerships.
- Student-mentor relationship is important; students usually consult to adults, experts and peer mentors.
- Customized modes of teaching and learning are used.
- Communication is interactive and 2-way learning takes place.
- It is short-term and temporary not historical and cultural.

- There is 24/7 flexible participation in hours of education.
- Learning programs are individualized (OBE, 2002).

All these changes also show that change of traditional teacher roles requires a significant change in design of learning environments. Technological developments and new learning approaches force to change the tools and equipment in the classroom, teachers' rooms, structure and functioning of school libraries as well as classroom sizes. For this reason, education places in our country should change accordingly.

#### **4. The Importance of Education Environments**

Family and social structure and values which family lives in are the first steps of the socialization process of an individual. Raising of every individual in our society as responsible individuals and their fulfillment of social duties and responsibilities without any intervention depend on the democratic attitudes and behaviors of parents, teachers and other adults involved in the socialization process.

The concept of globalization and the issues discussed based on this concept have not been clarified due to the uncertainties in the definition of that concept and the breadth of the field of action. The discussion is continuing since it has different ideas and approaches. It is not fair to define this situation as negativity because this is a process and the discussion about the concept of globalization should better continue. If we approach this discussion based on the principles of rationality and logic, we can say that globalization should not be perceived as establishing homogeneous culture suitable for a single place that means narrowing the world as a single place and increasing the frequency and tightening the intersociety relations (Akdemir, 2004).

Today, schools are defined as a place of learning and it is expected that the learning in the schools is realized in an effective manner. All schools can provide appropriate education and training services when the necessary circumstances and conditions are met and they can achieve effective and successful learning with the improvements in their internal and external environments.

Schools contribute to the development of the society by closely watching and embracing social, cultural, technological and economic developments in our country and the world and transferring them to younger generations. It is expected that schools both develop and change the society which they are in and protect and cultivate existing culture of the society. For this reason, schools should be vibrant and dynamic structures. This dynamism can be achieved by creating sufficient physical spaces in schools.

Since education system is in relation and interaction with the socio-economic, political and cultural systems around its environment, schools which are the main production unit of education are affected by the changes and developments that occur in those systems. The school is a resource center that meets the needs of society and environment, and therefore it should develop itself according to the expectations of environment and society.

Architecture of the 21st century is undergoing a change to meet the people's needs. However, in this century, we can find the opportunity to realize what we have not been able to do before and to correct our mistakes only in contemporary, technologically open, flexible structures and comfortable surroundings that allow teamwork. When we look at in the light of the terminological and conceptual explanations, it is possible to define the concept of "regulation of education environments" as the use of the physical items in the education environment and place in the most efficient and healthy way in accordance with the intended objectives. The regulation of education environment involves a social environment that encompasses physical space and all stakeholders including students, experts, teachers, parents and other interested parties. This comprehensive business requires

interdisciplinary interaction or in other words cooperation of science branches such as behavioral sciences, psychology, biology, ecology, engineering, architecture, technology and economics.

Characteristics of a place in which a system is located should be in harmony with equipment, process and objectives of the system. The place, as part of the system, has to be in harmony with its other parts. Otherwise, it can be predicted that there will be problems in the educational activity. Physical environment specifies the characteristics of the place reserved for educational activities. Tools such as desk, table, cupboard and many other factors like empty spaces, heat, and light and color scheme of the place constitute the physical variables of the environment, and they significantly affect teacher-student relationships. Therefore, the importance of the arrangement of environment in education and training activities cannot be denied. While in-class objects gain value when they are used by the people, they become meaningful and functional as long as they contribute to training.

School should create an environment that allows raising individuals who are open to discussion and share experience, and participatory. A school environment that is appropriate to child psychology and enjoys the students by appealing to the eye and feelings should be arranged by avoiding any kind of structure that is alienated and found strange by children. School should be considered together with the facilities such as garden, multi-purpose hall, laboratory, swimming pool and sports ground. Schools should be equipped with contemporary education and training equipment, and tools and equipment which are already available should be used efficiently. At the same time, physical arrangements must be made in the school building towards the different needs for the children in need of special education and pre-school and advanced age levels.

Education environments should direct students to explore, experiment, experience, discuss, play, socialize and develop their imagination and thinking skills, and encourage students to innovate with their architecture, form and wide range of activities. In addition, it is necessary to consider the user's psychology and needs while arranging places to be used by people. No matter how much the education programs are developed, school buildings are the places where those programs will be held. Changes in educating-training approach have also profoundly affected the physical structure of schools, for example change of traditional teacher roles has significantly changed the design and decoration of classrooms. Changes in curriculum also affect the structure of the classrooms. Classrooms of future will surely be very different from those of today. It is thought that technological developments and new learning approaches will affect mostly the classroom sizes. Thanks to portable walls in classrooms it will be possible to enlarge them when needed. Interactive learning approaches require more space and flexibility. With the rapid development of technology and the introduction of computers into every aspect of human life, in the near future, it will be possible to find dynamic classroom environments where each student has his or her own mobile computer since primary school.

Education is arrangements made for people to come to a better situation and is an activity identified with people. School and its surroundings can be considered as one of the main places of this activity. Nowadays, it is undeniably accepted that schools should raise individuals who "learn learning" and "healthy" in physical, cognitive and emotional aspects. It is important for schools to arrange their spaces and environments in the process of raising this awareness and culture of their students, by taking into account many physical environment elements, from seating arrangement to number of students, color harmony, appropriate light and heat level, adequate hygiene conditions and aesthetics.

In our country, the design of school and its surroundings should now be considered as a process in which architects, interior architects, pedagogues, managers, teachers and students collaborate and work together with an

interdisciplinary approach. By arranging schools in a way that will facilitate the educational and training activities and will increase the efficiency, schools can become places that serve to society as well as students and teachers (Atabay, 2014).

## 5. The Importance of Designing Education Environments for the Future

The purpose of education is to raise people in order to provide individual and social improvement and happiness as well as development. Turkish students in the age group of 15 have been ranked 34th among 44 countries in the *Creative Problem Solving Skills* category of the *Program for International Student Assessment (PISA)*: 2012. According to *Human Development Index*: 2011, our country has been ranked 92nd among 173 countries. According to Turkey Statistics Institute's (TSI) 2012 data, only 12.2 percent of the population over the age of 18 has undergrad or higher education degree, 11.9 percent didn't get any education, 48.8 percent has elementary and secondary school degree and 26 percent has high school degree in our country.

The impact of architectural design of schools on success is an accepted reality today. Even the harmony and parallelism between the design of the city and the design of the schools and classrooms are emphasized. For example in Finland, it has been observed that teaching objectives and content and the design of schools, classrooms and school gardens and all physical equipment are handled in integrity. This practice in Finland has been continuing by improving since 1970.

Changing education programs, courses, their duration, practices, books, strategies; using smarter tools; but not designing places and environment of those places according to these changes is one of the main reasons why you cannot achieve the intended result. If systems are changing but places cannot keep up with this change, nothing really will change.

Changes that occur in the educating-training approach should affect the physical structure of schools. Change in traditional teacher roles changed the design of learning environments significantly. Technological developments and new learning approaches force to change tools in classroom, teachers' rooms, structure and functioning of school libraries as well as classroom sizes. In Finland, it is a simple yet highly functional implementation that classrooms can get larger or smaller by portable walls when needed in many schools. It is obvious that interactive educating-training methods and techniques require more space and flexibility. If trainers want to give an interactive course, how can this happen in a classroom with fixed desks? Evidence expresses that school design has increased student performance and provided more creative approach in training and learning.

Schools should be designed in accordance with gaining creative thinking, problem solving, critical thinking, group and individual work, communication and entrepreneurial skills and aesthetic values aimed in educational programs. Unless suitable learning environments are designed, emphasis on the importance of these skills does not indicate that the students are equipped with them.

Evidence expresses that school design has increased student performance and provided more creative approach in training and learning. In his book "*Savage Inequalities: Children in America's Schools*" (2012), American writer and educator Jonathan Kozol says that "*If children are forced to come and go to school buildings that kill their souls, then the school reforms have no value*".

Although there are many changes in the education system in our country, it is enough to take a look at the schools and classrooms in order to see that these changes do not effect learning environments sufficiently. The research on the physical conditions of universities conducted by Ibrahim Tuncel in 2008 showed that the

classrooms of the faculties where he took samples were located in the basement, the windows were in a higher place close to the ceiling, so the sunlight was not used enough and the classroom had a traditional seating arrangement and have no technological equipment. The results of the research also showed that the physical characteristics of the classroom obliged to organize a “teacher-centered” educational situation because of the teacher's limitation of method-technical selection. Students also stated that they did not enjoy the course and did not feel the need to attend classes because of crowded, cold, stuffy and dark classroom environment.

John Dewey believes that schools prepare students for democratic life and the way to do that is depend on students who live democracy directly in a society where the schools are located in. What to do: Democratic schools work and develop better than traditional schools, besides protecting our democratic society. The education and learning of democratic schools can be used for the continuation of our democratic society. A set of researches shows that various success measures of students trained in a democratic society who benefit from democratic education are better than others, regardless of socioeconomic status, race or ethnicity (Glickman & Gordon, 2014).

In the report “*Does the Physical Conditions Have an Impact on the Learning Climate*” prepared by Economic Development and Cooperation Organization (OECD) in 2010, it is argued that the balance between the social environment and the physical conditions must be taken into consideration in the design of educational institutions. According to a research on physical conditions of educational institutions in the United States, it is understood that reading skills increased 26 percent and mathematical skills increased 20 percent in schools that have more daylight. In a study about relationship between student performance, success, behavior and physical environment in the UK, it was found that the results of exams were 11 percent higher in well-designed buildings than regular buildings. In another study, 60 percent of the students stated that the design quality of the building influenced their university choices.

Classroom environment, school environment, neighborhood, city and a country... In fact, these environments are intertwined, integrated and increasingly complex ecosystems. Each element in this system maintains an education cycle by influencing each other. If a change is made in one part of the system and the change in the other part is ignored, a successful cycle turns into a vicious one, and the same things repeat (Kayan, 2014).

## **6. How Will Schools Look Like in the Future?**

With the introduction of Web 2.0 into our lives, while the change of internet culture, the content produced by internet users, and the effective use of these interactions in education environments are the most used subjects, now the subject of “how will schools look like in the future” has become one of them. Will regular classroom practice continue? Or will it transform into an environment without walls in which students follow their own education?

While so many different ideas were being discussed, Sweden took the first step in this area. VITTRA schools that manage 30 schools in Stockholm, Sweden, introduced the new school system without walls with the concept of “Future Schools”. The school, designed by interior architect Rosan Bosch, designed the appropriate environment for students mainly to support their learning on their own and as a group project. Even the smallest piece used in the design of the school was designed to allow students to interact (Kazancı, 2013).

### **6.1 According to This Scenario, An Education Environment is Established without School**

A network that is composed of online experts and supports students without administrative structures is

envisaged. The success of this scenario depends on the availability of the significant technological infrastructure of home computers at a specific bandwidth. Low-cost capital means high-level training and good quality staff-student. Learning is completely online. High-level knowledge which supports the learning process are available thanks to peer-to-peer connection between learners and external experts or teachers. External organizations, such as museums, also have a role in this learning community. Each student creates a digital working portfolio by following the individual learning path at its own pace. It creates a powerful group without capital expenditure other than technology (Illich, 2014).

### **6.2 The Fortress Type School Scenario**

There are strict security protocols for threats such as gangs and terrorism. It is solely the campus school that will create a clear barrier between school and society. There are neither community facilities in the school, nor something popular that invites you to come here. It is designed for safety only, and those who come here may encounter with hard barriers. It resembles medieval educational institutions to some extent. Teachers in these schools teach, monitor, evaluate and focus on the goal. Other adults stay outside the school boundaries. The isolation situation at this school may offer peace and tranquility to students who are focused on learning. These schools resemble traditional monasteries or madrasas to some extent.

### **6.3 Dispersed School Scenario**

In this scenario, the school campus's location is spread over a wider area. The school is dispersed across the community. Specialised faculty centers are clustered near to local specialist functions, and in many cases the community resource is shared with the school. The school capital budget is directed at both the shared and dedicated resources, benefiting the community. In particular, facilities can be used 24/7 by the community outside of conventional working hours. Time is transferred to prevent students from losing excessive time. Pedagogy is relatively conventional, and eligible to evolve in elsewhere. Staff would be based at specialist locations, but would rarely meet; new technology would allow efficient organization without contact (OBE, 2002).

### **6.4 Extended School Scenario**

It is a very substantial campus that also houses other public service functions, like police, health or libraries. In addition, it would offer small scale start-up enterprise support and even subsidised housing for teachers, nurses and other public service workers. Students learn in a complex way due to the diversity of the community learners and experts within the campus, necessitating a flexible timetable. Adult learners may also share community facilities with the students. Teachers also have a community role; managing the inputs, and the learning, of these other adults in the learning environment. Key community figures provide leadership and mentoring (OBE, 2002).

## **7. Conclusion**

In order to maintain education phenomenon which is constantly changing and developing in the 21st century, it is necessary to develop an education environment that is suitable for this process. For the development of this environment, education and training environments as the means of socialization and culturalization which are the most important elements of education also need to be renewed accordingly. The sustainability of education in new social environments will be possible through transferring habits, standard of living and learning experiences that school culture has brought to people, to social life. Today, the sustainability of learning environments should be in social life.



Along with the change of learning environments, benefit gained by individuals from each other or by mass media will also affect communication. Schools and studies have been conducted on learning environments of 21st century in America and Europe. We will also be able to benefit from these studies in modern urban transformation projects. Thanks to transformation, communication will also differentiate between teacher and student. Interaction between people and communication with mass media will affect the learning process of students.

For these reasons, it is necessary for teachers to be able to teach with mass media based on the learning environments of 21st century and to acquire ability to communicate with their students according to these environments. They should have the ability to transfer these acquired communication features to their students effectively.

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