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# Studying the status of science and technology education spaces in management of providing the space and educational equipment for schools in fundamental evolution document

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**Abstract**
The aim of designing the education spaces is to providing the required spatial relationships for education processes. It means that the spaces and equipment which are required in every field, how and by the which discipline thy have been arranged to offer the final aim of education in advance, is the achievements of providing the education spaces management. The purpose of study is to evaluate the status of science and technology education spaces in management of providing the space and educational equipment for schools in fundamental evolution document Iran Education. In this survey, the research method is content analysis and it is descriptive in regards to practical purposes and collecting the data. The statically population for this research is the Iran Education Fundamental Evolution Documents, the criteria and standards for designing the educational spaces and documents about the education history. According to the results, evolution in the providing the spaces for educating the science and equipment adaptation with day technological infrastructure are crucial. The recommendation for reviewing the status of educating the science and technology and symmetry of facilities with the need to the space and equipment for educating science and technology in the system of management of providing the space and equipment in compliance with local culture and todays and future technological needs and attention to the extension of garden school model was discussed.

**Keywords**: *educational equipment, educational spaces, garden school, science education, fundamental evolution document.*

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## Introduction

One of the effective training factors in the neo-education and detraining is the architecture, physic and environment of school. In the neo-education and training, the physical environment of school should be such that play a role in the quality of the educational and training activities of students as the dynamic and alive factor. Consequently, paying attention to the way of designing the educational environments, especially in the elementary level, assumed to be an essential in knowledge architect urea in line with the increasing the students' learning and making creativity in children and students. Efficient education and training, and shaping the thoughts and abilities of society can perform more efficiently by obeying the required rules and standards in designing the architect ring the environment and equipment's in different educational levels and by cooperation of other related organizations such as programming and budget organization, and organization of renovation, development and equipping the country's schools in increasing the scientific and knowledge level of students, and training their soul and achieving to the more efficient education and training( Molaei, 2005,11). The scientific and technological literacy is the set of knowledges, skills, and attitudes in the science and technology areas that every human needs them for living (fundamental evolution document, 2011, 45). one of the factors which directly impacts on the enhancing the community members' scientific and technological literacy is the quality of educating the sciences in the educational and training systems. Our country for development needs to enhance the quality of the scientific and technological level literacy of people. Therefore, coordination with the ever-changing world's evolution is one of the concerns of to days human.

Subsystem of providing the space, equipment's and technology in the fundamental evolution document of education and training

In the area of providing the space, equipment's and technology the lack of educational spaces and facilities and equipment's is more apparent and can discuss about it in two parts of educational spaces and educational facilities:

**A) Educational space**

Although every year it announced that education and training organization has faced with the lack of classroom and educational spaces, based on the Conducted studies the average number of students in every class is not very different from average number of students in the level of world. Even this average is less than the number of students of countries that have high rank in the Times test. This issue shows the inappropriate distribution of educational spaces. For example, yet we face the lack of educational spaces in the capital of provincial and big cities especially overcrowded cities in the small counties and in some areas because of lack of students the classroom is empty for all of the year. One of the training affecting factors in neo education and raining is the way of architecture, school's physics and environment. In neo education and training, the school's physics should be such that as a dynamic and alive factor play a role in the quality of the educational and training activities, it means that school's educational and training activities should be perform in the appropriate spaces with standard dimensions and be according to the interests of students in order that teacher in teaching and student in learning feel satisfaction and motivation and enjoy from it (Tabatabaian and et al. ,2011, p.94). The low per capita for laboratory and workshop in country has its adverse impact on inability to conduct the examinations and practical works by students. The researches show that per capita for laboratory and workshop in meant of country's schools is lower than the average of world standard.

**b) Educational facilities**

The lack f educational and educational assistance material, inadequate heating, cooling and lightening systems, lack of computer and educational software's and shortage of audiovisual

equipment's are the items which their supply directly depend on the sources of providing the space, equipment's and technology, it is obvious that the lack of these resources has bad affects on the student's efficiency in the science and technology area.

The arrangement of traditional classrooms is notable according to the neo approach in the science education regarding to the team activities. Currently, many schools in the country face shortages for providing the laboratory instruments and suitable benches for performing the team activities. Today's world has noted that youth educating and training is a kind of national investment and every country has a more effort for this aim to benefit from the more development and growth in the future (Emadzadeh, 2007, 11).

**The research literature and backgrounds**

In the Iran educational systems the teachers are free in choosing the science teaching method, although there is a recommendation in the teacher's guidebooks or workbooks. In most of the schools, science teachers use same traditional methods for teaching and educating the science. Science teachers in their teaching uses in major Lectures, problem-solving and question and answer methods and have a satisfactory skills for starting and ending the teaching and final activities, but yet they do not perfectly use discussion, playing role, project, Feld trip, laboratory and predentation methods. Although the educational purposes and content (lesson books) are based on an active approach and is attempted that teachers avoid traditional teaching methods, but in practice the neo educational methods are not employ by all teachers, which maybe its main reason is that new purposes of educating sciences are not understand very well by them, however this procedure is in progress ( Badriyan, 2006, 23).

The results of Shabani's survey (2001) show that the most of students believe that science teachers have good behavior, begin the lesson by the loud and pleasant voice and with the adequate question, explain sufficiently, for transferring some lessons they give an example and give an opportunity to make a question. but teachers do not pay attention to introduce the references and conducting practical experiments.

At all, science teachers utilize a lot from lecture, while less use the problem-solving, project, laboratory, ad presentation ethos. On the other hand, they do not employ the discussion, role-playing, question and answer, discovering, field trip methods.

**Education and education organization in the course of entering Islam in Iran**

**The first scientific centers and field**

The scientific motion a movement of the Muslims started from Medina, the first book which is attracted Muslim thought and Muslims followed it lesson and study was, the Holy Quran and then Hadith. so the first scientific domains established in medina and the Arab people of Medina and Hejaz became familiar with teachers and student and sitting on the course circle and reciting and recording what can hear from master,. The Muslims with grate greed and eager learned the Qur'an verses that revealed gradually, and commit it to memory and what they not know, asked from the people that Prophet (PBUH) send them as agent of writing "Qur'an verses and were known as revelation writers. In a day, the Prophet was entered to the mosque and see the two circles was formed at the mosque. In one of those circles, people was praying and worshiping and the other one was teaching and learning. After looked both circles said, "Both circles make good work, but I am sent for training" (azarkasb, 2011,p 40).

**History of experimental science education in Iran**

According to historical evidence, almost before the thirteenth century the education system in Iran was, the native military educational system and the process of intellectual and philosophical tradition was based in the past; in the school that houses coaches. graduate

education in the period equivalent is a fun, education of children and adolescents, and in the selection of content and sources and types of courses available, whole and completed them, according to their taste, the texts for training of election returns and learn skills considered s reading, writing and to strengthen the mental skills of students, religious and moral education were also learners educational and architectural spaces.

**Architecture and native Iranian schools spaces:**

Any space architecture, especially architectural space, should the geographical and climatic characteristics could provide favorable conditions for responding to humanitarian needs. Climatic factors in shaping the physical space and one-sided schools have not always decisive impact. One of the most important elements of the atmosphere of a school, stone, and that the most important role in the development of physical space it is in final form, Rooms being built in four directions, causing a particular landscape has been developed. Schools functional spatial elements include: cell, teacher, library, mosque, servant rooms and signalized and rinse and health services. Architecture initiatives have caused considerable diversity in architectural schools, Placement of spatial elements so that the function of schools often located around a central courtyard. For elongated shape of the courtyard or near the place) to listen findings Right or chamfered

School entrance at one end of the route passes through two sides and center of the box is located. On the other hand shaft space above the front entrance space is taken, other than Hjrh- function like the dome of a mosque and a school house, school, library or a large veranda used as a mosque or a teacher assigns - rose (dodangi, moftakhari, ghavidel , jalali chimeh2015, p. 276).

Providing continuity arrangements to achieve these targets in Iran with the provision of education and status Productivity in supply management space and training equipment science and technology education spaces in schools document of fundamental transformation that education is obvious with the following two questions for research and provide recommendations on the functioning it is considered desirable education system.

**Research questions**

1. How is the status of science and technology education spaces in the school space supply management system in the fundamental transformation of education?

2. How is the status of science and technology education equipment supply management system of school education in the fundamental transformation?

**Research method**

And in this research content analysis and applied research method is descriptive in terms of data collection methods. The population of this research is the fundamental documents of Iran education system.

In the meantime, the theoretical foundations of the fundamental transformation of document reviews education needs under the supply management system in space and the experimental sciences departments in the schools training equipment to compare the status of experimental sciences and technology in Iran, facilities and space and equipment needs to the experimental sciences and technology supply management training and schools were paid space e.

**Discussion and the findings of the first research question**

1-how is the status of experimental sciences and technology education spaces in supply management training space and in the fundamental transformation of schools. the experimental science lesson is one of the main course in the primary and secondary education. To teach this lesson, space, equipment and the method must be fitted such that on the one hand designed to meet the needs of students in the field of innate ¬ of understanding their response to environment, understanding the wonders of the world for their help and

knowledge increase comparing to the creator of the world and on the other hand, it is fitted with knowledge and insight about the need for present and future life of the familiar.

**Classroom space**

To comply with the conditions of space design students certainly depends on sufficient understanding of their growth properties. Physical and psychological characteristics of the students in the development of space planning and design, is the basis for them. If the space and its elements fit with students, they easily can of spaces and your related (shatrian, 2001p39).

arntzan and ivans (1984 ) found out ceilings taller in the course decreased intelligence of teachers and students and that the ceiling height of classrooms and teacher satisfaction with equal relationship of course. However, the ceiling taller may have another problem. The main issue argued artman schools older is that they benefit from MSC stretch ceilings feature reduced lighting and noise problems will increase to reflect (ride and et al 1999). 6 the ceiling height, affected the behavior of the group activity and co-operation among the preschool

Given the difference in size between the school, adaptability sized furniture is also wise guys and actually should be supported. The size of the various pieces of furniture such as tables and chairs, couches, stands, shelves, etc. must be commensurate with the size and scale of Students (dodangi, moftakhari, ghavidel , jalali chimeh, 2015, p. 282).

The modernization of schools in educational facilities design criteria:

1. Health room should be clean and have sufficient light and use it for examination and not another.

2.The length of this room must be more than 6 meters to allow the panel to determine the visibility.

3.In every school for every 750 students, health educator must be present.

Boards must be at the proper height so that its distance from the first row of students is at least 2.2 meters.

4.Length and width of the boards according to educational level:

5.The height of the black Board of the tableau and its length in primary school must be 70 and 270, guidance school 80 and high school must be 300 cm.

6.For primary school at least two thousand square meters per 100 students to add a hundred thousand square meters of space for each additional is required.

7.For guidance schools and secondary, at least four hundred thousand square meters for each student to add thousands of square meters per hundred students Additional required.

8.Based on the above criteria, the necessary minimum area per student in the school is 6-8 square meters will be.

9.Number of classes in primary schools and guidance even possibly period in two floors and three floors in the form of specific maximum for high school professional and technical knowledge school is the maximum four story's.

10.Children's playground with an area of 10 square meters per capita for each student.

11.Covering of School garden and the floor should be non-course non-penetration, slider, no content, non-shiny stones and easy for washing and cleaning. Floor coverings made of ceramic for courses and corridors and school area must be asphalt.

12.Making any upscale related terraces and balconies is prohibited.

13.classroom walls must be as high as one and a half meters of stone and the rest of the colors are bright and clear and sound insulation is covered and non-glossy.

14.It is desirable to have in class II, which is not difficult for emergencies.

15.The need for ventilation in primary schools and a half square meters, and the volume of air required four and a half cubic meters.

16.The maximum acceptable size of 7 meters wide and 8 meters long classroom.

17.Window class to use air conditioner and enjoyment of natural light conditions must be favorable.
18.Paint all the roofs white.
19.Capacity of primary school must not have more than 30 students There are
20.lunch rooms, library, art room, laboratory and consulting room titles including a school needs (Ghazi- Mahalle . 2007, pp. 80).

**The use of the roof space to create school extensive green roofs**

Extensive green roofs are characterized by low weight and maintenance cost yin foot. The roofs are usually inorganic growth environment of mixed sand, gravel, crushed brick, clay, peat, soil organic matter and some soil mixed that the depth of the arable, is variable between 50 and 150 mm. Depending on the depth of soil on the roof and the conditions of ecology and many of the facade, plants should be short and strong and can survive in the arid region. Native plants each location, due to the ability to adapt to local climate, are a good choice for green roofs. The roof of the least practical experience and technical considerations for installation and maintenance is required (Townshend, 2006, p8).

Development and implementation of a green roof includes creating space on a roof covered with plants is a man-made construction. Ceiling or roof word in this definition means any continuous surface to protect residents against natural factors issue. Clear space on the ground or above-ground plant can be, for example, on a balcony, a roof suspended on a floor of the building, or at high altitudes above the Earth, was at the top of a building (Dunnett and Kingsbury, 2004, p 8).

**Development strategies of green in designing of garden school**

In the field of Green Garden development in schools is necessary, saying that the advantage of today's Green increased the spirit of creation and creativity, to feel a sense of happiness, variation in environmental educational spaces and improve the spaces. Learning Knowledge acquisition, skill), attitude and values (activity of human beings on the basis of an overall tendency for perception and get the concepts around social learning and a process of a few more complex later. that is by email, or through our learning may. developing around the inscribed age) of home, community, workplace and school to the world of the country (e). Learning to change our behavior or attitude as a person and groups in the size we are is the result. Therefore, the most significant and measurable learning is as follows. It is also a historical process due to the fact that consecutive generation cooperate to collect and transfer to their gradual knowledge, skills, attitude and values (Faris, 2006, 7).

**The second research question discussion and findings**

How is the position of experimental science and technology education equipment management in providing space and equipment for the fundamental transformation of schools education how?

**Theory of learning, creativity and educational spaces**

Based on more traditional practices, the researchers believe that education is not only effective for the creativity of the child, but prevent children from moving in this direction (amil, 1996; Torrance, 1990, 1990; berg, 2000). So, if possible, teachers, appropriate and secure space in Change class and active exploration and educational methods and the proper equipment in the class, the students interest in order to exploit their creative force have helped (Hosseini, 2002; banghl of Sharafi and davari, 2009,p 85).

Several studies in recent decades in the field of creativity, in addition to study the characteristics of creative people, looking for to answer two key questions in this context are: first, whether creativity can be taught? And if the answer is yes, the question arises how? And whether creativity can be measured? Again, if the answer is yes, how? (Abedi, 1993; quoted from daemi and Moqimi Barforoosh, 2004, p. 2).

Torrance and Torrance quoted O'Neill, Abedi & Spielberg, (1994) point out that over 15 years of experience in research and teaching creative thinking, have found evidence which suggests that creativity can be taught. One of the subjects had the most applications; the Torrance Tests of Creative Thinking is TTCT. O'Neill and colleagues (1994) say more than two thousand articles which Torrance test as the criteria used to measure creativity, were published (daemi and Moqimi Barforoosh, 2004, p. 2).

**Learning theories in educational spaces**

The remarkable thing in learning and educational models, further up the kid on the category Meta cognizant; In this respect it must be said that the vacuum the meta-cognitive abilities of people thought Ah them (gilford1975) says: the nature of the intellectual resources to have known that they can have control. Davis (1991 (also stated that help to understand the importance of solving of creativity; increasing the recognition of creativity, causing the Iranian issue to incite people in the creative ideas "rango and chand" (1995) also have expressed that the intellectual thought, and innovative solutions lead to insight (, living, Jalali 2015 p. 274). the science of learning theory of Constructivism (construction) in the definition of this theory can be fitted to the vehicle, said the view is said to be fitted on the active role the learner in understanding and understanding and meaning to the data and the data fitted emphasis (Saif, 2002, 333).

Based on the theory of constructivism, people personally make their pattern or mental maps. In the process of learning, previous knowledge used as a framework for new learning and in this way the patterns are reviewed, expanded or rebuilt.

**Spatial organization and arrangement of training facilities**

Align tables, individual work is conducted in accordance with the increase in work leads (1999; Galton, et al) in a research Vedal and colleagues specifically compare, the arrangement of furniture and chairs, (1995, Wheldall et al Hastings; 1987, Wheldall & Lam; 1981). this study showed that the accuracy and success of the fact that students were less affected due to the arrangement of desks were significantly when they burst until sat around a table, sit, increased. The authors note that a critical

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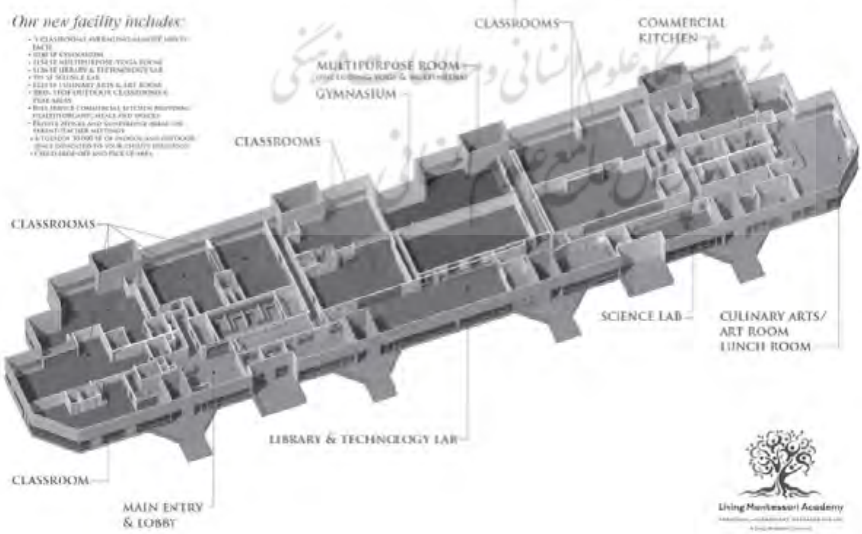


Image 1. Plan of England Montessori School garden, www.dorsetdesignbuild.co.uk

element of mediation between the physical environment and classroom conditions have improved, reducing negative interactions between teachers and students, because students are able to concentrate senses are arrangements in rows of desks And therefore, pursuant to notice and less blame the teacher. This striking admission with every chain in the occasion of physical changes, So the arrangement of seats and all the furniture is on the effective learning of students working to change the Earth and affect their success. And level of participation of students in discussions and ask questions during the course will be higher (Higgins, Hall, Wall, Woolner, Mc Caughey, 2005) because the arrangement of different rooms with different goals for the course, it is necessary to have some flexibility,. Simultaneously, the flexibility of operating as both a physical space in educational quality, Parents of the look and feel of space research, in which evaluation took place, the teachers explained how the design space can cause restriction and empowerment of children. They have a large space in the description of the teachers, the kids can have a work room, which sounds less and improve the ease of visual monitoring. They are emphasizing that flexibility means that a room with the imagination of kids and they change according to the thoughts and fatigue from them (laps Berris * Miller, 2011).

It seems that the arrangement and organization of different for different fields of learning and training is required. It is necessary for a school an a clear vision in the direction of designing facilities and have the facilities that can be compatible with the training and learning (2007:3, Stevanson, 14 K: Higgins et al 2005)

**The angle of view or the cone of vision in the classroom**

The classroom is actually the main part of the training section of the theory of primary education centers. What is the role of the basic classes determine the dimensions, then surely the number of chairs that the determining factor is the cone of vision. Cone of vision actually is the range of the observer) students (easily able to see the theme of sight) and the master Board (in the case of such standard; section there is also a primary school teacher. viewing angle 140 degrees about teacher should be taken into consideration upon which the class width is better; classroom in the first and second floors to be considered that the reason is the volume of the visitors users and, students be easier and more comfortable Depending on the type of the class lessons are provided from the greater population, or in other words the class with large capacity design surface should have a slip surface that the behind members easily be able to see the tutor Board (dodangi ,moftakhari ghavidel jalali, chimeh, 2015 p 283).

**Conclusions and applied recommendations**

In the contemporary world with educational patterns and practices of teaching traditional and inefficient management and training system and pre modern management process, how education can interact with Modern scientific developments, in a world of interaction. Students who deal with educational institutions, with the virtual environment, and information and communication technology, In the face of traditional patterns of communication and training in the school and the weakness of the methods and patterns and the equipment in it, experiencing the conflict and inefficient feeling, and the meaning and philosophy of the school is questioned in their vision. Lack of laboratory and workshop per capita in the country, leads to inability to conduct experiments and practical work by students, Investigation shows that the per capita laboratory and workshops in many of the schools is lower from global standard average; Lack of teaching materials and teaching aids, unfavorable heating, cooling and lighting, lack of education and lack of audio-visual, computer and software, including those that supply them directly to the management of space resources, equipment and the technologies are dependent, obviously that lack the resources on the perfor-

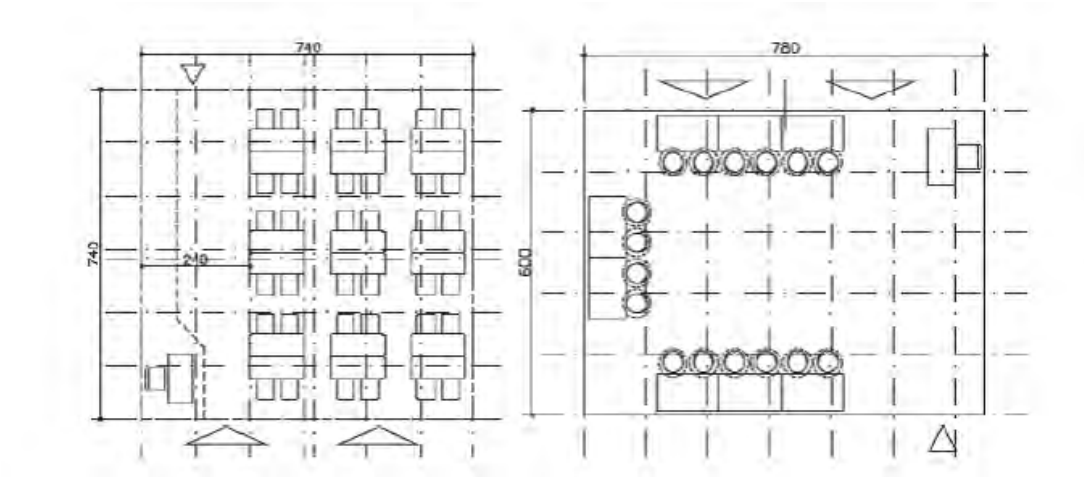


Image 2. Sample -the arrangement of primary resource centers classes; rules and standards of schools reconstruction organization

mance of students in the field of science and technology will have an adverse impact.

Arrangement of the classrooms is traditional, according to this new approach of teaching science in regard to the very considerable group activities. Now many schools in the country to provide testing kits and benches suitable for group activities are lacking. Current World finds that education is a national investment and every country in this way trying to do more, benefited from the growth and further development Strategies for reaching the ideal situation in making scientific and technological education in sub-systems provide space, equipment and technology To achieve the desired status in this system following recommendations are the presented:

1. Planning to build schools and educational space proportional to the population growth of any region

2. -preparing Plans to build a school garden in the modernization of the country's schools and its implementation at the country level pilot

3. Equipping and proper distribution of educational facilities and laboratory equipment in schools

4. Equipping schools with computers on the use of daily information technology

5. -equipping Special school desks to coordinate with group work in the classroom

6. as a suggestion for future research, amount of complying schools with related conditions and standards in the criterion of renovation of schools educational space are presented

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