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EFFECTIVE CRITERIA OF EDUCATIONAL USES LOCATING

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ABSTRACT

Rapid growth of population in Iranian cities has been accompanied by an increase in demand in the field of urban public services. In response to this demand a lot of urban lands without a documented system and a careful planning have been used for construction and exploitation which have led to lots of problems in terms of providing services to all different strata of society. Much of the problems are associated with the lack of proper location for municipal services. Whereas the correct locating of public municipal services plays a significant role in space utility from the citizens' point of view, on the other hand assists urban planners in order to achieve their the most important goal which is the correct locating of public services in the city. In this direction, the educational use is considered as one of the most important uses in urban space that due to the lack of attention to proper spatial distribution safety and welfare of the citizens will be tarnished and social justice will be undermined because the combination of appropriate uses will provide the social justice of urban residents so that all sectors of society will gain it equally. Therefore, to observe the criteria for locating and stabling an educational use such as considering the level and Educational suitable per capita not only leads to the increase of the quality of the services offered by this use, like promoting students' educational level and creating motivation and eagerness among them, but also results in reducing the transportation costs as well as diminishing the traffic jam inside the city. In this regard, our study is a descriptive research. The data was collected based on library studies and assessing the related articles using references and

documents related to the topic. The criteria which impact on locating an educational use with the aim of providing welfare and safety of citizens were identified through the desired spatial distribution.

Keywords: Locating, educational use, utility of a space, welfare and safety of citizens

INTRODUCTION

Optimized locating for activities has ever been considered by economy scholars and geographers. They have always contributed in genesis of locating theories in order to maximize earnings and to minimize the costs of urban land. Nowadays, in addition to the economic prospects (to maximize the earnings and to minimize the costs) which should be considered in utilization of an urban land, due to the complexity of human needs and consequently increasing the complexity of urban systems, the lack of a systematic attitude and definition of precise criteria, to use an urban land and locating an activity according to that and to response appropriately to the needs will not be possible [1]. Rapid growth of the population, as a result of people migration from rural to urban centers and the lack of a documented system and precise planning in most of Iranian cities have caused many problems. One of the most important problems is the decrease of municipal services per capita including the educational services. Educational services and urban facilities are vital services and spatial distribution due to

the direct impact on families comfort, decrease of the costs of trips within the city, proportionality and coherence of spaces and beauty of the city are of great sensitivity. According to a research conducted by Ministry of Education, 20% of the constructed schools since 1979 to 1996 are useless since features of locating and particularly the demandant population density had not been observed [2].

Statement of the problem

To offer suitable public services such as educational services for the citizens is one of the important goals of an urban land use planning [2]. To allocate space for educational use is an important issue which is considered in urban planning and in our country due to the lack of attention to infrastructure studies and providence as well as the emphasis on hast and urgent decisions, authorities have faced with problems of positioning and educational spaces; thus, after a short time by increasing the number of students and related activities, the selected spaces get in trouble and can't response students' needs. To use the efficient and

advanced systems is the key of success in selecting optimum educational centers [4]. On the other hand, in order to establish social justice in a city, different uses including the educational use as one of the original needs of the residents of different parts of the city, should be in good condition. It is clear that, evaluation of this proportionality requires determination of some criteria that according to the affinity of the culture and teaching, schools proximity to cultural uses can be considered as an advantage for the educational use status of a region [5]. Equitable access to the land and its optimization are 2 basic components of sustainable development. Today, the quality of a land and urban space concept has been changed in terms of natural- skeletal and economic- social aspects. It is obvious that to use a space as a public and vital source and wealth it should be planned in principle [6].

The necessity of the research

To organize any urban element for accessing to a special pattern, it is necessary to investigate precisely features of any element, clarify the quality and quantity of the acting in order to identify the interaction between the elements in terms of being homogeneous or heterogeneous. To establish educational and training spaces because of the criterion impact on body and tissue of the town and a

high financial burden requires an extensive research. Various uses in a town particularly high demand uses such as educational uses due to the many reasons like the lack of coordination of educational institutions, financial problems of education sector and non- familiarity of authorities with academic standards of locating in response to students' needs suffer from many problems including the lack of students' optimum access to training environments, proximity to unfavorable uses and consequently compromising the students' educational quality, transportation costs, wasting time, etc. [5]. Traditionally, the importance of paying attention to schools and the locations has possessed a special place in Iranian culture. As, before Islam schools were built near the temples as the most valuable and sacred place and as the schools were used for teaching religious sciences [6]. Optimized locating for training centers is important since it impacts development pattern of the city and determination of a spatial distribution pattern of the demand for residence and staying in the city and amount of the trips inside the city. Hence, it can be used as a tool to control and adjust the spatial distribution of the population and facilities and to diminish the concentration as the factors of increasing the population,

transportation, traffic and energy waste. Thus, optimization of educational centers as a service with a high level of city demand plays a great role in meeting the needs of different groups and sectors for establishing the social justice. Therefore, assessing the educational use with regard to the criteria in different regions of a city can measure the level of social justice among the different groups for designing the urban spaces and uses [5]. Many issues result in the lack of principled locating of educational environments within a city. The lack of organizations' coordination with each other and the lack of the education sector affordability as well as the lack of a direct relationship between schools modernization, development and equipping organization and urban design agencies prevent the achievement of proposed locations for educational spaces in comprehensive and detailed plans. This also results in focusing on state-owned lands and non-observance of the principles and criteria of urban lands in creating educational spaces [6].

Purpose of the study

The present research aims to identify the impacting criteria for the optimum locating of an educational use which leads to the enhancement of this type of use, decrease of urban transport time and costs as well as

reduction of financial burden imposed on education system and families. To provide social justice and to promote the education quality are the goals of this study.

Review of the literature

Muller (1998) analyzed locating of educational centers in Copenhagen, Denmark. He presented a pattern for locating educational spaces which is based on spaces registration bracketing according to the selected paths. UNESCO (1996) rated the influence area for any school of urban areas by distance and time. In this research, areas of schools shortages and surplus using a geographical information system were determined and by network analyzing, optimized paths were identified. Farhadi (2000) using the access radius for locating the new spaces, evaluated spatial distribution and locating of educational spaces of Tehran 6 region. Farajzadeh and Soroor (2002) in a research titled as *locating the educational centers of guidance schools of Tehran 7 region* found out that in terms of spatial distribution the studied schools were not distributed desirably. They suggested 21 points for establishing new educational centers. Farajzadeh and Rostami (2004) after assessing the features of availability and servicing capability of the educational centers, proposed new points for establishing

training units based on the access radius. Salehi and Reza Ali (2005) presented a favorable pattern for organizing the educational units of boys' high schools in Zanjan and suggested some solutions for accessing of students to the areas without access [7]. In addition, other scholars have conducted remarkable researches in different fields of lands use assessing particularly educational uses of which the following examples are presented: [6]

RoodabehFarhadi (2002) in her article titled as *the analysis of spatial distribution and locating of schools using a geographical information system* attempted to introduce the locating of capabilities of this system and emphasized on the factors of distance and population.

Hooshangsoroor (2002) in his master thesis titled as *management and locating spatial spaces* examined schools locating in Tehran 7 region. The results show that schools of the region have not been distributed well-proportioned and students don't access to the desired access radius.

Abodl Reza MojirArdakani (2003) evaluated the urban land use of Ardakan city of Fars province. He discovered that the most of the available uses in terms of quantity such as per capita, criteria and in terms of quality such as compatibility, utility and capacity are

unbalanced and don't comply with criteria and policy planning. He also explained how to balance, organize and optimize the land use.

Mohammad Reza Karami (2003) conducted a research titled as *locating vocational schools using a geographical information system* (the case study of Tabriz). He studied Tabriz vocational schools in terms of 2 features of population density and access network. The shortages have been identified and located by this research.

AbodolfathRahmani (2006) conducted a research titled as *using geographical information system for spatial distribution and dispersion of educational centers* (the case study of Yasooj). He considered the geographical information system in spatial distribution and dispersion of educational centers and presented the results. The model of overlap index for optimized land use was applied in this research. The results suggested that educational centers of Yasooj didn't have a suitable compatibility.

In order to reduce urban traffic, Mahmood Safarzadeh and et al. (2008) in a paper titled as *optimized locating of schools and educational institutes*, emphasized on travel size. The results showed that by optimized locating of schools appropriate welfare and

health conditions are achieved for the students.

Akbar Taghizadeh (2009) in his article titled as *evaluation of educational spaces of Shahrood* used two models of FUZZY and AHP and emphasized on these models for locating the educational spaces.

In order to provide regulations and a pattern for establishing schools, in 1974 several studies were conducted under the supervision of Education Technical Office by KarloNesta, the expert of UNESCO in Iran and his colleagues which was titled as *regulations and criteria of education structures in Iran*. Gazizadeh, B. (expert of Education Modernization Agency) in a book titled as *Evaluation of principles and criteria of education spaces* designing in relation to the skeletal locating issues of a school and site selection provisions has considered issues of compatibility, utility and capacity of the schools and presented criteria for each issue. [3]

Research methodology

The research was conducted by a descriptive method. The data was collected based on the library studies and evaluation of the related articles. By using references, documents and evidences associated with the research, effective criteria for locating the educational use with the purpose of providing welfare

and safety of the citizens through the desired spatial distribution was identified.

The main discussion

Educational uses due to the nature and activity level, at first must be located in a place that doesn't prevent and disturb other uses (compatibility). Second, the location should contain the needed provisions for the activity (utility). Third, the activity should has a certain functional area. Forth, to offer favorable services, the need for the activity and services of some other uses as well as some distance with the other uses are required (dependence and refrain). Accordingly, in the process of urban land use planning any of the educational uses (Kindergarten, elementary school, guidance school, high school) are located after the determination of the functional area in the hierarchy of urban skeletal divisions (neighborhood unit, distinct, alley, region, etc.) and by observing other regulations and criteria, are located and designed. During the completion of the strategic planning process , to ensure the establishment accuracy of uses and to offer the optimized service, quality and quantity of the current status of the uses are assessed in order to apply the necessary modifications in the future programs [1].

Locating criteria for educational uses

To identify general and comprehensive criteria for urban uses locating is difficult because of the cultural, natural and etc. differences in different societies. However, these criteria in all human societies follow a unique goal (humans' welfare and comfort). The criteria have a lot of common aspects and categorized as 2 general and specific groups: [1]

1. General criteria for locating urban uses

Any urban planning and consequently land uses planning aims to provide economic and social welfare and citizens' comfort. Thus, for locating all urban uses including educational use and etc. the following criteria should be observed:

- a) Compatibility: according to this criterion, incompatible uses should be located far from each other and supplementary uses should be located close to each other.
- b) Efficiency: in locating and allocating a pace for a special activity economic aspects and exploitation of the activity should be examined.
- c) Comfort: different uses should be located in terms of distance, time and ease of access.

- d) Utility: in locating activities, utility should be considered in terms of landscape, natural factors and etc.
- e) Health: in allocating a land to a certain activity for providing health, features such as density, per capita standards, environmental issues, cultural heritage, pollution and etc. should be considered.
- f) Safety: in locating uses, safety and meeting the security needs of people and their property and public sources against the natural disasters should be considered.

2. Specific regulations for locating educational uses

In addition to the general criteria, the educational uses appropriate to the activity and special services must observe certain criteria, too. As, the different activity levels and functional area, educational uses (kindergarten, primary school, guidance school, high school, university, college) in order to offer the optimum service need to design and observe certain criteria for locating. School, in the hierarchy of skeletal divisions of the city is considered as the indicator of a neighborhood and is located by observing specific criteria in a city's districts. There are various viewpoints regarding schools locating criteria; however, only the

general view-point along with the criteria that are confirmed by the responsible agency are presented. According to the general viewpoint, specific criteria of locating are categorized as two following groups:

The first group is associated with schools establishment terms

Environment:

- a) Suitable and compatible proximity
 1. Proximity to playgrounds and mini sport grounds
 2. Proximity to cultural institutions
 3. Proximity to public green space
 4. Proximity to residential tissues
- b) Proximity limitations
 1. Be far from disturbing industrial workshops (at least 500m)
 2. Be far from main streets

The second group is associated with the criteria and basic properties of the location:

- a) Useful function radius: any school should be located in a district that students' maximum traveled distance to access the schools not to be more than 1200 meters.
- b) Population coverage: on average 10 thousand people (average population of a district) by observing the maximum performance radius is useful.

- c) Separate parts must be in accordance with the number of the students and the proposed per capita.

Responsible agencies have emphasized on the following locating criteria:

- a) Compatible uses: proximity to the residential uses, cultural centers, green spaces, etc.,
- b) Incompatible uses: proximity to air polluters uses (industries, terminals,...), acoustic polluters (highways, airports, railways, crowded commercial centers) and environmental polluters (Sewage, slaughterhouses, dairies, cemeteries, hospitals, etc.).
- c) Environmental conditions

- 1. The earth's natural status

- To avoid constructing schools in lands with the slope of more than 8% and in mountainous areas in lands with a slope of more than 15%

-To avoid constructing schools on weak lands with low resistance, in the direction of open and abandoned aqueduct, low and floodgate lands, watercourses, faults, lands with the risk of avalanche or landslides.

-To avoid constructing schools on the lands of power transmission lines

- 2. Navigation

-To avoid constructing schools in the direction of severe winds

-To construct schools in the direction of the sun and easy ventilation.

3. Availability and access radius

- Lack of direct contact with the streets, main roads, crossroads, squares and traffic networks.

- Access possibility for all helping vehicles to the school.

- To observe the maximum access radius (15- minute walking).

Evaluation of educational uses in terms of compliance with standards

Evaluation is one of the necessities of planning process and a requirement for ensuring the precision of the plan and sufficiency of the functions for achieving the goals or revision of the future plan. Evaluation requires quality and quantity comparison and assessment of the use current status with the criteria and general and specific regulations of the use establishment in environment, basic specifications of the any use place and the related standards which are defined by urban consultants in the process of urban lands use planning confirmed by the responsible agencies in order to assess the uses to what extent observe the criteria and finally to realize the level of compatibility, utility and etc.

Educational uses can be assessed in 2 terms:

- Quantity assessment which is conducted according to the uses per capita current status comparison with the related standards or by modeling and predicting the current and future needs.
- Quality assessment: in this method quality features of locating and establishing different uses in a place in relation to each other are assessed by means of 4 matrix (compatibility, utility, capacity and dependence) through the information on the current status of a use).

1. Compatibility matrix

Compatibility matrix is affected by the viewpoint that the activity of all uses established in a region must not disturbed and prevent each other. This matrix evaluates this issue according to the criteria defined for any use and regarding the current proximity status of the same use and finally the following states can be imagined:

The uses are fully compatible, fully incompatible, rather compatible or indifferent with each other [1]. In other words, according to the urbanism planning, those uses which are in influence area of each other should be compatible in terms of consistency

and don't disturb and prevent each other. In other words, those uses can be located in educational use proximity that there is no obstacle. Considering the unique features of

educational space like silence, safety, being away from any pollution, these uses can't be located in close to some uses [7].

Table1: Regulations and criteria of the establishment of schools near to the other uses.

Fully compatible proximity	proximity to the educational use (Kindergarten, elementary school, guidance school, high school) proximity to sports facilities (Play and mini sports grounds) and cultural centers (library) Proximity to residential tissue with any density value Proximity to markets (local and weekly) Proximity to religious site (mosque of the neighborhood) Proximity to health centers (health center and an independent doctor) Proximity to places of leisure (park of the neighborhood) Proximity to open space (urban sports grounds) Proximity to transport passages (local sidewalks and roadways)
Rather compatible proximity	Proximity to places of leisure (children's park, district park and region park)
Indifferent proximity	proximity to sports facilities and cultural centers (cinema and theater) Proximity to religious site (Hosseinieh and Tekiyeh) Proximity to health centers (public bathroom) Proximity to vital installations (fire departments) Proximity to industrial centers (light industries) Proximity to manufacturing centers (agricultural lands and gardens) Proximity to transport passages (fast road way)
rather incompatible proximity	proximity to sports facilities and cultural centers (cinema and theater) Proximity to religious site (Hosseinieh and Tekiyeh) Proximity to health centers (public bathroom) Proximity to vital installations (fire departments) Proximity to industrial centers (light industries) Proximity to manufacturing centers (agricultural lands and gardens) Proximity to transport passages (fast road way)
incompatible proximity	Proximity to health centers (hospitals) Proximity to administrative centers and police (government and police) proximity to sports facilities (sports halls and stadiums)

2. Utility matrix

in this method, compatibility of a use and establishment place are evaluated, so that any use for standard offering of services needs a suitable place in terms of size, land dimensions, situation, slope, physical

properties, availability, equipment, pollutions and near uses. By comparing these factors with the current status of the use, the utility level is determined and if needed will be involved in the next program of the new guidelines. This method is useful for

individual study and comparison of the uses [1]. In other words, utility of an educational space requires the recognition of the activity type, performance, requirements, actions and reactions that the educational use creates with other uses. Utility means maintenance of the natural factors, landscapes, open spaces, green spaces, road network, ways and residential spaces. Utility is associated with all natural and environmental conditions including temperature, relative fog, air flows, light, the soil type and the land slope that should be considered in locating an educational space. Acoustic comfort should be regarded, too. In educational centers acoustic quality should be involved in a way that doesn't disturb the education. In addition to acoustic conditions, suitable light is required, too. Good weather condition is another factor which impacts on man's comfort in inner spaces of educational centers. This factor is affected by climate condition that is temperature, moisture, air movement speed and thermal radiation. [7]

3. Capacity matrix

This method tries to evaluate this: "Does a use is established based on the scale and activity area proportional with different levels of urban skeletal divisions. Any educational use (Kindergarten, elementary school, guidance school, high school) has a special place and a certain performance and any of the skeletal divisions (neighborhood unit, alley, district, region, city, ..) requires a particular activity level. If the location and performance area of the uses are not in accordance with the urban skeletal divisions, comfort and welfare of the citizens will be disturbed and many other problems will be made. Table 2 shows the proportion of different educational levels with different urban skeletal divisions. According to the table, any level of an educational use can include 5 states in terms of performance. [1]

Table2: Proportionality of different educational levels with different levels of urban skeletal divisions

Country	Area	City	Region	district	Subdistrict	Neighborhood Unit	
•	•	•	❖	▼	-	○	Kindergarten
•	•	•	▼	○	○	-	Primary School
•	•	•	▼	○	○	-	Guidance School
•	•	▼	-	○	-	▼	High School
▼	○	○	▼	-	•	•	College
○	○	▼	❖	•	•	•	Small University
○	-	❖	•	•	•	•	Big University
Table Guide							
•	❖	▼			-	○	
Fully Inappropriate	Rather Inappropriate	Indifferent			Rather Proportionate	Fully Proportionate	

4. Dependence matrix

Some activities of a use are dependent to the activity of the other uses. For example, a residential district without other activities (educational, health, commercial, ..) is not able to provide residents' comfort and welfare. Similarly, different urban skeletal levels need different activities or the same activities with different scale. To ensure the suitable proximity to the dependent uses and being away from independent and obtrusive uses, by using the dependence matrix the observance level of proximity to the supplementary and dependent uses will be assessed; as well as the uses will be investigated in terms of observing the suitable distance with incompatible uses in order to reduce the related negative impacts [1]

- Schools are dependent to the activity of the bellow supplementary uses in order to offer the optimum service:
 - a) Public green spaces
 - b) Cultural institutions such as library and cultural centers
 - c) Mini sport grounds and playgrounds
 - d) Proximity to the residential tissues
- Schools have to avoid proximity to the bellow uses in order to offer the

optimum service and observe the required distance in order to diminish the related negative impacts:

- a) Air polluters (industries, terminals,...)
- b) Acoustic polluters (highways, airports, railways, crowded commercial centers, ..) environmental polluters (Sewage, slaughterhouses, dairies, cemeteries, hospitals, etc.)
- c) Direct relationship with streets input/output, main roads, crossroads, squares and traffic networks

CONCLUSION

The necessity of regarding the locating criteria in an educational use in different regions is of great importance since in addition to the positive effects such as the region traffic load regulation, quality and quantity enhancement of education, establishing the social justice and exploitation from the positive effects of cultural uses in a city for: [5]

1. Equity establishment using the facilities for all the residents of a city.
2. Promotion of educational uses efficiency as a result of proximity to the cultural uses.

For this, according to the planning index features (considering policy making for preparing a systematic program for achieving the goals), planning (considering objective and perceived aspects of elements and phenomena), locating, implementation, monitoring and management some suggestions have been offered: [4]

1. Appropriate distribution of educational and academic centers within a city so that the all citizens can easily access.
2. Specified planning
3. General coordination in urban plans
4. Considering the population, culture, social and economic issues in the study area.
5. Including the potential and limitations of urban spaces
6. Regarding locating criteria in land use planning (compatibility, comfort, performance, utility, and health and safety standards).
7. Using updated tools and techniques like geographical information system for analyzing information and locating academic campuses
8. Evaluating social and psychological effects of an optimum training space and justifying and explaining it for urban design experts

9. Selecting uses proportionate to the learning environment according to the location.
10. Evaluating each element of training, according to the performance in the urban environment
11. Making coordination between the different organizations and agencies in locating urban educational facilities.
12. Considering the behavior and demands of students and developing an efficient and relaxed environment in order to create incentives for higher education.

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