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The Effect of Expanding Higher Education Centers on the Use of Its Surrounding Areas in Tabriz Metropolis

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Abstract: The development of university centers is one of the causes of the modern physical alteration of cities and has a major impact on the development process of the city. This research studies the impact of university centers on changing and developing the use of spaces around Tabriz Metropolis. The research tools included observation and direct field studies, reviewing the maps of in 1968, 1996 and 2011 and using the base map in 2006 and changes made in the courses have been reviewed. GIS and SPSS software were used to analyze the maps. The statistical sample of this research is 480 uses around five universities (Tabriz State University, Medical Sciences, Payam Noor, Arts and Islamic Azad University of Tabriz). The research findings show the impact of university centers on changing land use patterns and urban development, especially the development of service and business spaces around these centers. Estimating the socioeconomic and cultural effects of academic centers on the surrounding uses has doubled the importance of changing the approach in the preparation of urban plans, the proper prediction of the effects of shaping factors and favorable landscape for the future of the city and the quantitative and qualitative development.

Keywords: Higher Education Centers, Metropolis of Tabriz, Use of Surrounding Spaces

JEL Classificaion: I25, P46, R12, N95

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1- Introduction

Cities, like living organisms, grew larger and more sophisticated in terms of construction and composition. The factors of the city's development are first, natural factors, secondly, economic factors and social factors that play a significant role in the emergence and development of a city. (Poorahmad et al., 2011). Any urban development activity involves land-use and physical change. Factors such as urban development, residential centers, infrastructure development, communications, etc. can change the uses of urban spheres. An important goal is to analyze the changes in land use, predict the future changes in land use, and measure the resulting effects. Higher education spaces and urban effective applications with a large scale in the urban area have a sphere of influence that suits their needs and developers of urban projects would like to locate and invest in important and active centers. In this field, campus spaces located in the city operate in the same way as absorbing magnetism that plays an important role in urban economics and employment. The reason for development, formation, shaping and transformation of the spaces by the university is due to the potential of internal and external development (the stable economy) in the nature of these centers (Hampton & Higham, 1999). Nowadays, the Third Wave Governance in the field of technology is the recognition of international circles of knowledge as a tool of power and universities as the intellectual command tower as a fundamental issue in the world (Ashrafi, 2008). The first modern-day university was created as the capital of Iranian modernity and the gate of civilization in Tabriz city. Over time, these centers, in addition to the cultural and social

influences, have been the source of significant changes in physical development and expanding the urban space. Tabriz city is one of the most prominent cities in the field of science and technology, which has become the subject of the development of academic centers due to the positive aspects of land use change and the development of residential uses and commercial and service spaces around the city. Land use map of the years (1968 to 2011) shows the changes well. With the quantitative development of universities, these centers have become a factor in changing urban spaces, urban economy and creating regional and local roles in Tabriz city. Over time, the effects of different aspects of these centers have led to a change in the use of vacant and residential land in favor of service and business spaces in the surrounding area. Considering the problems of housing and physical development of Tabriz city in mountainous and high-risk areas, the establishment of university centers in other parts of the city, and consequently the change of utilities, without coordination with urban plans, will cause a problem of balance of use in the city. Therefore, considering the importance of this use in the development and change of Tabriz city, this article examines the impact of the development of higher education institutions on the uses around it. In developing countries, especially in Iran, where investment in higher education is higher, the question arises whether higher education centers have been able to influence the development of their peripheral spaces, change, and create their specific users according to their needs.

In this regard, the research questions are as follows:

- Has the development and expansion of higher education centers in Tabriz metropolitan area been accompanied by changes in land uses around these centers?
- Is the educational status of Tabriz Metropolitan Higher Education Centers effective on the development of commercial-service units around it?
- Has the economic role of Tabriz Metropolitan Higher Education Institutions been effective on extending the service and business use around it?

2. Literature Review

a) Foreign Researches

In 1999, Hampton & Higham emphasized the meanings and concepts of a university town, developed communities in several universities in New Jersey, and emphasized the importance of the role of universities in economic, cultural and service issues, and so on. As a result, the role of the applications with the ability to influence city development in the form of weighted cores in urban areas is very high.

Andersson et al., (2009) did a research entitled "Urbanization, productivity, and innovation: Evidence from investment in higher education" and argued that over the past two decades, the Swedish government has pursued a decentralized policy of high education, which has had a huge impact on the productivity and distribution of space in the national economy. They also said that investment in higher education has had a positive impact on urbanization and its growth in Sweden.

Wiewel & Perry in "global universities and urban development" acknowledged that the importance of the university's role in urban development is undeniable,

as the knowledge of re-creation, transfer of experiences, recycling the texture of worn-out neighborhoods is the effect of the existence of universities in cities.

b) Iranian Researches

Poormohammadi & Jamkasra (2011) in a study entitled "an analysis of the uneven development pattern of Tabriz city" concluded that due to changes in land uses, the city faces an inconsistent development process. Open spaces, especially green spaces, orchards and agricultural lands around them, have been increasingly exposed to interference with other uses and degraded, and in terms of population density, they have always increased their human and structural densities. To the extent that urban planning projects do not respond to developments and outcomes.

Motavali & Charmzadeh (2011) did a research entitled "The Role of Universities and Higher Education Institutions in Urban Development (A Case Study of Islamic Azad University of Babol Branch)". Research method was mixed (descriptive, analytical, and documentary etc. The questionnaire was used to collect information from 400 citizens of the city including 100 faculty members and university staff, 100 students, 100 ordinary citizens and 100 urban and elite officials selected by cluster sampling method. The results of multivariate regression analysis, path analysis and t-test showed that most respondents evaluated the impact of the existence of the Islamic Azad University of Babol Branch on the development of the Babol city and the variables of education, welfare, economy, culture, and so on. In addition, the results showed that the respondents' satisfaction about the attention of urban development projects

to the student population of this city is very low.

Moosakazemi et al., (2013) did a research entitled “investigating spatial function of higher education institutions in sustainable development of metropolitan metropolis of Tehran metropolis.” In this research, the research method is descriptive-analytic and based on two methods of library and field studies. The results of this study indicate that there is a significant relationship between the two; in this way, Tehran metropolitan higher education centers have been influential in the sustainable development of urban culture, but this relationship was stronger in Tehran district 3 than in District 19. In order to understand the trend and extent of the impact of higher education institutions on promoting urban culture in Tehran metropolis, according to the developed indicators, a non-parametric binary test was used in districts 3 and 19, and to examine the significant difference between the two areas of the test Non-parametric Mann-Whitney was used. In addition, the results of this study showed that one of the main areas of sustainable urban development is the establishment of a link between higher education institutions and urban management.

Esfandyari et al., (2017) in a research entitled “A study of the role of higher education institutions in physical development of cities using WASPAS model in Zahedan” argued that the positive impact of the establishment of Sistan-Baluchestan University as the first rank, and in the subsequent degrees of Islamic Azad University and medical sciences on the physical expansion of the city of Zahedan around these institutions.

3- Theoretical Background

The term “sprawl” or “horizontal expansion” of the city, from which urban sprawl is referred to, has become one of the most controversial issues in the world. Considering that most of the cities in Iran have experienced this unfavorable urban phenomenon in recent decades, many researches have been done on this topic. And this term has been translated into various meanings such as the horizontal expansion of the city, urban dispersion, indeterminate growth, etc. (Teymoori et al., 2013). Various factors have been effective. This effect is associated with land changes due to the particular attractiveness of the factors influencing the expansion of urban areas. Therefore, land user changes include changing user types and changing the distribution and spatial patterns of activities and uses. In other words, changing land use means changing the type of land use which today is not necessarily a change in the earth’s surface in the world, but also a change in the density and management (economic, social, cultural) of the earth (Poorahmad et al., 2011). Urban land changes can be due to different factors and the role of land value in this regard is of considerable importance. Henry Munch studies in the Chicago area based on the principle of the value of land show that if the land price increases in the alternative users relative to existing users, the likelihood of the change in usage increases (Azimi & Pooyan, 2014). However, with the explanation that the causes of land use change varies between developed and developing countries. In developed countries, land use change is rooted in economic reasons, such as large-scale agriculture, urban development, and an increase in the need to maintain

environmental quality for the current generation and future generations, but developing countries, rapid population

growth, poverty and economic situation are the main factors influencing the formation of the city (Ningal et al., 2008).

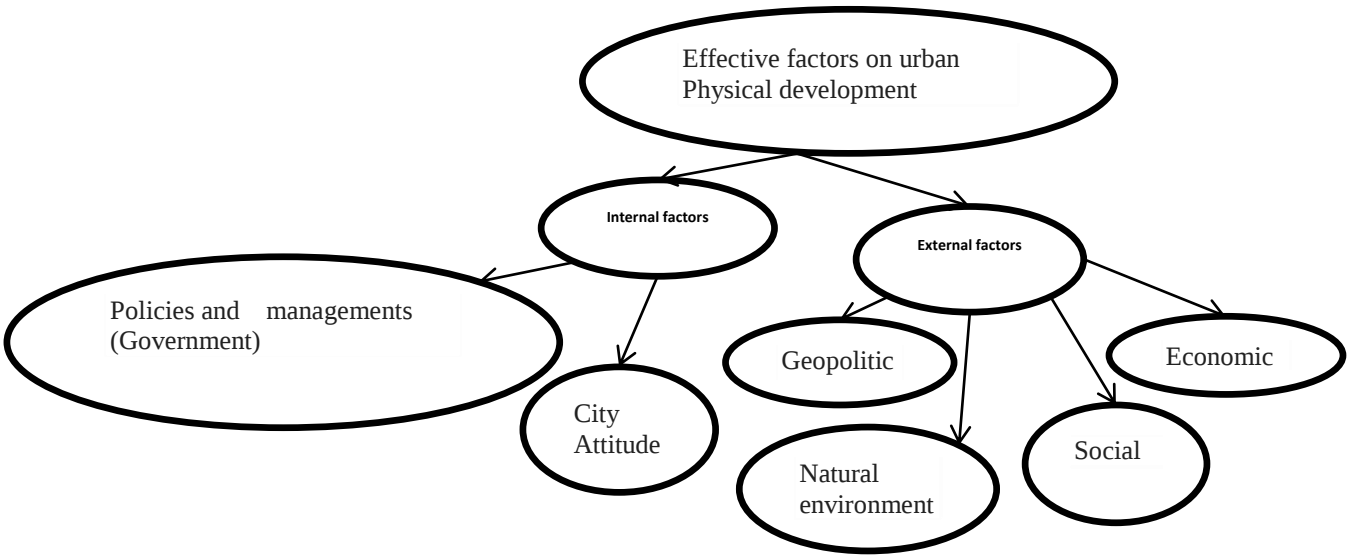


Fig.1: Effective Factors on the Physical Development of Cities
Source: (Vahedian-Beyki et al., 2011)

In scientific theories, the key role of the university is one of the main factors shaping the city. Harris has divided cities into several categories in terms of their role which include: industrial city, city with commercial role, city with role of production, city with transit role (Farid, 2005), and university cities that were responsible for producing knowledge and solving regional, national and global problems (Araste et al., 2008). In addition to specializing and educating the community elite in different branches of human knowledge, with its own development, urban infrastructure is also provided for their goals and color. The university has two points of view in economic development and urban change:

First, in terms of providing efficient human resources by increasing the efficiency and individuals' productivity;

Second; in terms of extending the boundaries of knowledge and technology.

Each urban development factor forms their own compatible spaces for example, regarding the economic role (second factor) of the university, in the second half of the 20th century, private universities developed in countries such as the United States, Europe and Japan, and consequently the demand for higher education without land use control caused land change around it. It is better to refer to the basic goals and concepts of the development of Japanese universities, which in addition to economic growth and development, the development and expansion of communication networks along with the restoration of industrial investment were two key issues for the development of higher education centers, which is one of the issues of urban renaissance and the second is the

urban economy. Since 1950, the development of the city has been tested and implemented by the public sector in the United States. In 1960, the government considered a serious program for the revitalization of major projects and plans. The municipalities also paid attention to this factor in urban development projects. Public and private companies began to operate continuously as strategic investments in the land-use planning literature. These discussions took place seriously, first time in the United States, then in Britain, and eventually in other countries, and in 1990, in Germany. Hampton and Higham state that university and university participation in a developed society that can provide the following are effective:

- Changing and improving the physical characteristics of the city;
- The development of the mechanism of adjacent factors;
- Attraction of residents with local-precautionary economy;
- Mobility and speed in expanding the economy through native employment programs;
- Facilitating in organizing youth education in city

Universities are effective on the development of society because they are interested in improving their surroundings and they sometimes have direct effect on the surrounding adjacent spaces. According to Harvey, university owns the surrounding areas and other urban areas, which, with rising real estate value, sells for free from impoverishment and develops quantitatively and qualitatively. University relations with the city through three effective forces are discussed:

- Moving from urban suburbs to downtown is due to development, which has a major impact on the expansion of residential and office spaces, and especially commercial services.

- Establishing relationships with the surrounding societies as new societies (behaviorist societies)

- The type of university activity for developing a knowledge-based urban structure and economy (Winwel & Perry, 2015)

4- Research Method

The hypotheses of this research are:

Has the development and expansion of higher education centers in Tabriz has been accompanied by changes in land uses around these centers?

Is there a significant relationship between the type of development of commercial-services departments and the educational status of university centers of the city?

Has the economic role of Higher Education Institutions been effective in expanding service and business use?

5- Research Method

The present study is of applied, its method is survey by observation and field surveys, reviewing maps, and matching current changes of used compared to the time series. To analyze data, Chi-square test was used. The statistical population of this study is the major universities in the city of Tabriz. In addition, the location of the statistical sample is the area around 5 universities with a radius of 1 km in the main paths around the universities.

Table1. Students' statistics of the researched universities

Universities	Year	Student number
Tabriz	1991 to 2012	۲۶,۸۱۵
Medical science	1991 to 2012	۸۶۲۹۰
Payame Noor University of Tabriz	1991 to 2012	۱۰,۲۹۲۹
Art	1991 to 2012	۳۳۳۰
Tabriz Azad University	1991 to 2012	۱۹۹۸۶

Source: (Statistical Center of Iran census; 2006)



Fig2. Location of higher education centers in Tabriz

5- Results

In order to answer the research question, "Has the development and expansion of higher education centers in Tabriz metropolitan area been accompanied by changes in

land uses around these centers?", Firstly, the percentage of land uses among five metropolitan centers of the metropolis of Tabriz during the years 1987 to 2010 was studied (Table2).

Table2. Frequency of land uses around five university centers of Tabriz metropolitan during 1987 to 2010

Land Use/year	1986-1991	1992-1997	1997-2001	2002-2006	2006-2010
residential	۴۶/۸	۱۷/۱	۸/۲	۲/۷	۲۸/۹
Commercial-service	۴۹/۶	۸۱/۴	۹۱/۲	۹۶/۶	۷۱/۱
vacant	۰/۷	-	-	-	-
other	۲/۹	۱/۴	۰/۷	۰/۷	۰/۷

The distribution of user during the years 1987 to 1991 shows that 49.6% is for commercial use, 46.8% for residential applications, 2.9% for empty land, and 0.7% for other uses. The results for the

frequency distribution of uses during 1992-1997 indicate that 81.4% of the users were commercial-service, 17.1% to residential applications and 1.4% to other land uses. The distribution of use between

1997 and 2001 shows that the share of residential use with the decrease and the share of commercial use has increased with 91.9% of uses belonging to commercial service, 8.2% residential and 0.7% for other uses. During 2002 and 2006, the share of commercial-service use has steadily increased to 96.6 percent. In addition, the share of residential uses during the downtrend reached 2.7% and 0.7% was allocated to other uses. The surveys during 2007 to 2010 show that

the trend of recent years has changed, with the share of commercial-service use with a decreasing trend to 71.1% and the share of residential uses with an upward trend of 28.9%. The share of other uses has remained stable. For example, the map of the use of spaces around the universities of Art and Payame Noor, Azad University, Tabriz University, and Medical Sciences of Tabriz in 2011 was characterized in the following figures (Figs 3 to 5).

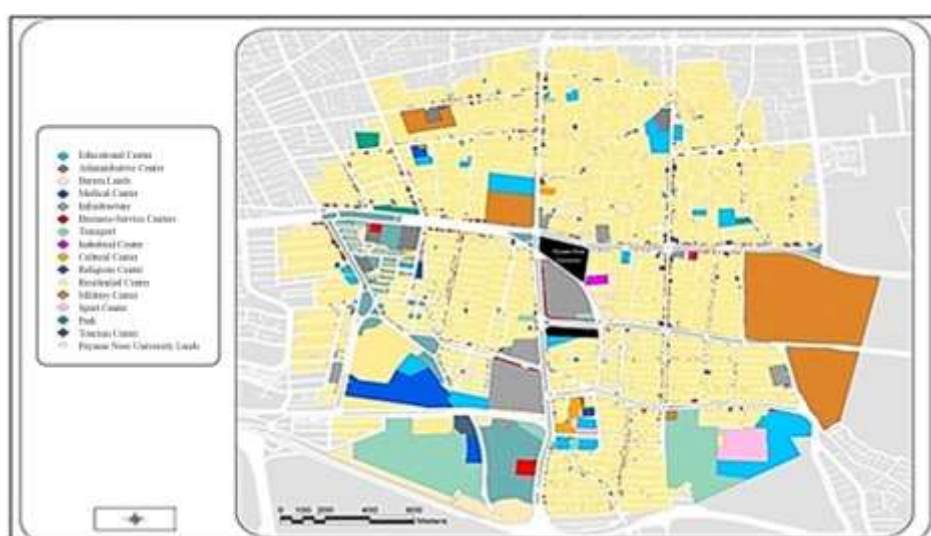


Fig3. Areas around Art and Payame Noor University of Tabriz in 2011

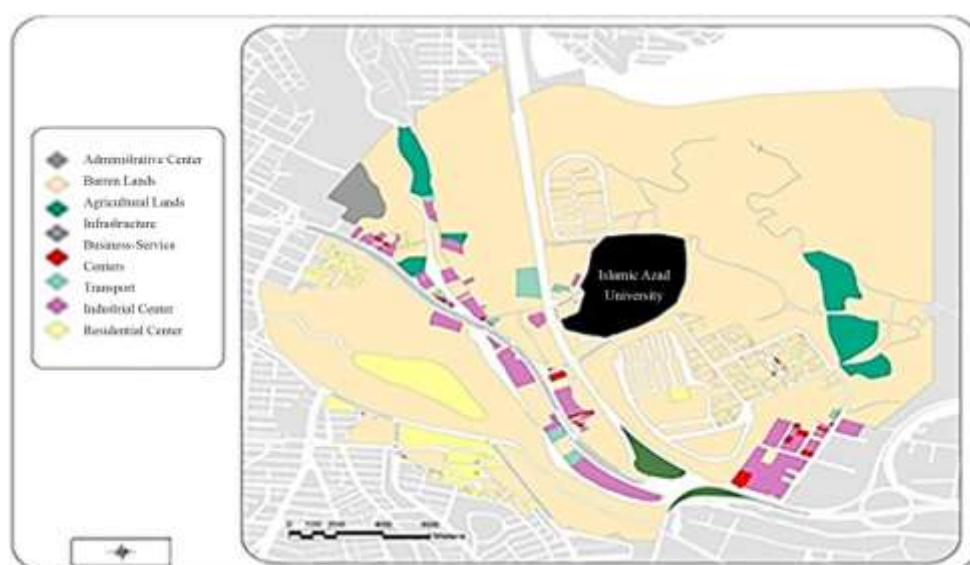


Fig4. Areas around Islamic Azad University –Tabriz Branch in 2011

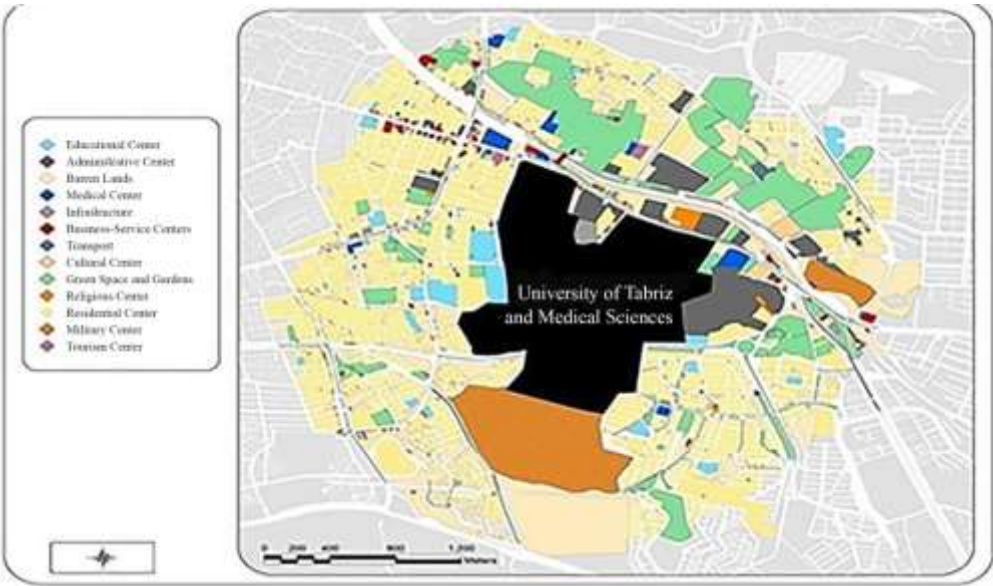


Fig5. Areas around University of Tabriz in 2011

Using the Chi-square test, whether the development and expansion of higher education centers in Tabriz metropolitan area has been accompanied by changes in land uses around these centers (Table4).

Table4. Investigating the development and expansion of Tabriz Metropolitan Higher Education Institutions by changing land use practices around these centers

	Land use change around Tabriz metropolitan education centers
Chi-square test	69.607
Significance level	0.000

To answer the second question of the research, “Is the educational status of Tabriz Metropolitan higher education centers effective on the development of commercial-services units around it?”, The chi-square test is used. The results show that the educational importance of higher education centers is effective on development of service-business units around it (Table 5).

Table5. Study of Educational Place of Tabriz Metropolitan Higher Education Centers on the Development of Commercial-Service Units around it

	Development of commercial and service units around Tabriz Metropolitan Education Centers
Chi-square test	75.527
Significance level	0.000

To answer the third question of the research “Is the economic role of Tabriz Metropolitan Higher Education Centers effective on extending the service and business use around it?” The results show that the economic role of higher education centers of Metropolis of Tabriz is effective on the expansion of service and business applications around it (Table6).

Table6. Investigating the Economic Role of Tabriz Metropolitan Higher Education Centers on the Development of Commercial-Service Units around it

	Development of commercial and service units around Tabriz Metropolitan Education Centers
Chi-square test	71.451
Significance level	0.000

6- Conclusion and Discussion

In this research, the effect of academic centers on the urban spaces of Tabriz was studied. The results of this study showed that higher education centers of Tabriz Metropolitan, as a prosperous use of the city, having potential and capacity, different economic, social, and cultural roles in the development and change of urban spaces are effective factors in the city. University is a service unit that its strategic development, growth, and importance have been increased in the expansion of cities over time. Universities are deployed in the city and hence the formation of related physical spaces, including the selection of the location and area of the earth with regard to the student population, the determination and prediction of amenities, services and recreation, the provision of transportation facilities around them, the establishment and expansion of scientific, educational and cultural centers, creating residential centers such as student dormitories, autonomous and boarding houses, and the development of public, administrative, financial, public services, are practically involved in the physical development of the city. The results indicate that the universities in the city of Tabriz were considered as weighted cores and caused a percentage of the reason for the development of urban spaces, namely physical development. According to the map of the surrounding areas of Tabriz city (other than University of Tabriz), data analysis evaluates the prediction of

changes (in time series) that having systematic future planning has a more sustainable perspective.

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