

Explanatory Modeling of the Environmental Factors Influencing the Formation of Sense of Attachment to University; Case Study: Students of Islamic Azad University, South Tehran Branch *

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ABSTRACT

Place attachment is one of the levels of the individuals' relationship with the place and it leads to the improvement in the behavioral and scientific performance of the university students by influencing their behavior and controlling their negative behavioral patterns in an academic environment. This is while the environmental factors influencing this sense depend on the type of a place's performance and the recognition of these factors, especially in academic spaces, in addition to the contribution to the enhancement of the designing quality of the academic spaces, assists the universities' officials, as well, in accomplishing one of their essential goals, i.e. the elevation of the university's academic level. Thus, the place attachment and its aspects were explained to identify these factors in the university environment using the correlation method based on the existing literature in this area and the assumed effective factors in the creation of place attachment in three aspects of functional, physical and social particularly in university spaces were studied within the format of the theoretical model. Then, to test the model, 373 university students were selected from the technical-engineering, art and architecture and basic sciences departments of Islamic Azad University, South Tehran Branch, based on random-clustering method following which the researcher-made questionnaires were distributed among them. After verifying the validity and reliability of the measurement instrument using the fit estimation indices and Cronbach's alpha coefficient, the gathered data were subjected to path analysis using SPSS Software and the direct and indirect effect of each of the assumed factors on the sense of attachment to university was determined. The results of this study indicated that, amongst the factors influencing the artificial environment of the university, "the proper proportion of the spaces' dimension with the performance" as well as "the number of their users" have the highest effect on the university students' sense of attachment to the university. Moreover, paying attention to the color used in the spaces and the thermal comfort conditions in the building indirectly lead to the improvement of the quality of the university students' relationship with the academic environment via influencing the performance of the administrative staff and the university-students' interactions.

Keywords: Environmental Psychology, Islamic Azad University, Place Attachment, Path Analysis.

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1. INTRODUCTION

One of the important incidents of adulthood is going to university for it is accompanied by a lot of changes in the individuals' life (Dadkhah, Mohammadi, Mozaffari, Mahmudnejad, & Dadkhah, 2011, p. 29). It has to be asserted that entry to university is the beginning of confrontation with a collection of uncertainties, biological, behavioral, social, affective and academic evolutions that per se set the ground for a sort of feeling insecurity and fear of future and occasionally pave the ground for the emergence of problems adversely influencing the university students' destiny (Abedini, Davachi, Sahbaee, Mahmoodi, & Safa, 2007, p. 140). Amongst these problems, academic failure, school dropout, and narcotics abuse can be pointed out.

These problems are not new phenomena and have a long history in the world's scientific communities. Therefore, numerous studies have been so far carried out, especially during the recent decades, in line with the reduction of these problems and the enhancement of the sense of attachment to the academic environment is amongst the solutions offered in this regard by the environmental psychologists. Many researchers, including Light (2001), Beck, and Mealy (1998) have realized the high sense of attachment as the reason of elevated cooperation and participation of the university students in the university-related activities that add to the university students' success, on the one hand, and to the university's credibility, on the other hand, and has mutual positive effects on university students and university (Light, 2001; Beck & Malley, 1998, pp. 133-137).

Therefore, the present article seeks to recognize the factors influencing the university students' sense of attachment to university thereby to help the designers and planners of educational spaces as well as the university managers and professors take positive steps through applying these factors for enhancing the university students' participation and commitment as well as improving the university and the students' scientific level.

The studies that have been carried out up to now for discovering the environmental factors improving the university-student bond can be investigated in two general sets. The first set pertains to the studies in the area of human geography that investigates the effect of the physical environment's quality in regard to which the studies by Razavian et al. (2014) can be pointed out. In the current research paper, physical factors are limited to factors like mountainous nature of the space, green space, vastness, diversity, form, suitable spaces for walking, position, legibility and access, and the qualities of the interior spaces such as color, light and arrangement of the classrooms and other issues have been ignored (Razavian, Shamspoura, & Molatabarlahi, 2014, pp. 87-96).

The other set of studies are related to the educational and psychological sciences and do not take the physical

aspects of the place into consideration. Amongst these studies, the studies conducted by Hajar Abdullah et al. (2014) and Mann Yuly (2012) can be pointed out that only investigated the effect of the quality of services, facilities and social dimensions of the university and introduced the quality of management, scientific programs and social relations as the predictors of the attachment to university (Abdullah, Wasiuzzaman, & Musa, 2014, pp. 282-292; Li, 2012).

This is while the physical, functional and social properties of the space all play a role in creating place attachment as highlighted in the theoretical studies performed in this regard (Daneshpour, Sepehri Moqaddam, & Charkhchian, 2009, pp. 37-48).

Therefore, considering the lack of a comprehensive model of the environmental factors influencing the sense of place attachment in academic settings and the necessity for explaining it to achieve the solutions of enhancing this sense, the current research seeks to offer a model of factors influencing the sense of attachment to academic environments through adopting a comprehensive approach to the environmental factors.

2. STUDY'S THEORETICAL FOUNDATIONS

Place attachment is amongst the multidimensional and interdisciplinary concepts proposed in environmental psychology; it is a bond and link between the recognized place and the individual (Kenz, 2005, pp. 207-218; Manzo, 2003, pp. 47-61; Giuliani, 2003, pp. 137-170; Brown, Perkins, & Brown, 2003, pp. 259-271; Altman & Low, 1992, pp. 1-12). Hernandez and Hidalgo add the "tendency to stay in a place" and "preference of a place to the other spaces" to this definition (Hernandez, Hidalgo, Salazar-Laplace, & Hess, 2007, p. 310). Based on this definition, spatial attachment is created when the individuals establish a relationship and bond with a certain place and prefer to stay and feel comfortable and secured therein (Hidalgo & Hernandez, 2001, p. 274).

Some of the researchers like William et al, Peterson, Rognbock and Watson (1992) and Bricker and Cresteter (2010) define place attachment with two dimensions, namely dependency on a place and spatial identity (Daneshpour, Sepehri Moqaddam, & Charkhchian, 2009, 2011, pp. 37-48), (bricker & Kerstetter, 2010, pp. 233-257) & (Williams Patterson, Roggenbuck, & Watson, 1992, pp. 29-46). Social bond is the other aspect added by Romickson et al. Willer and Smith (2012), Vinvin, Kyle and Suten (2012) and Hidalgo and Hernandez (2001) to the aforesaid two (Ramkissoon, Weiler, & Smith, 2012, pp. 257-276; Wynveen, Kyle, & Sutton, 2012, pp. 287- 296). In this perspective, spatial identity is recognized as the dimensions of the space that define the individual's personal identity with respect to the physical environment (Proshansky, 1978, p. 155) and the spatial dependency is realized as the importance given by an individual to the reuse

of the place (Jacob & Schreyer, 1980, p. 373). The aforementioned 3D model has been used as the basis of the recent research for measuring the amount of sense of attachment in the university students for its acceptance by the researchers. This paper does not get involved in the conceptual discussions of the place attachment and only deals with the brief introducing of the environmental factors influencing the sense of attachment solely in the forthcoming part for explaining a theoretical model for attachment to the higher education settings.

The studies carried out on the researchers' attitudes like (Oswald & Wahl, 2001, pp. 7-11; Cohen & Shinar, 1985; Bonaiuto, Carrus, Martorella, & Bonnes, 2002, pp. 631-653; Pretty, Chipuer, & Bramston, 2003, pp. 273-287; Altman & Low, 1992, pp. 1-12; Tuan, 1978; Riley, 1992, pp. 13-35), have pointed to the role of individual factors and time, as the contextual factors, as well as to the attitudes towards the physical, social and functional factors as the environmental factors. From the perspective of the researchers, the increase in satisfaction with the physical (Marcus & Sarkissian, 1988; Stedman, 2003, pp. 822-829; Eisenhauer, Krannich, & Blahna, 2000, pp. 421-441; Brower, 1988; Green, 1999, pp. 311-329), functional (Bonnes & Secciaroli, 1995; Mesch & Manor, 1998, pp. 504-519; Cohen & Shinar, 1985; Keller, 1968) and social (Fried & Gleicher, 1961, pp. 305-315; Cohen & Shinar, 1985) factors of place would be followed by the increase in the level of the individuals' satisfaction with place hence the sense of place attachment in the individuals. In a recent study, these three factors have been explained as stated below according to two questionnaires of European Foundation for Quality Management (EFQM) (Ezadi, Salehi, & Gharebaghi, 2009, pp. 19-54), and SERVQUAL Model (Ghalavandi, Beheshtirad, & Ghaleei, 2013, pp. 49-66; Zivyar, Ziaee, & Nargesian, 2012, pp. 186-173; Sattari, Namvar, & Rastgoo, 2014, pp. 177-195), that is devoted to the evaluation of the satisfaction of the users with place (Fig. 1):

A) Social Factors: according to the fact that professor and students are envisioned as the two main actors in the university environment, two indicators of professor-student relationship and the student-student relationship were considered for evaluating the satisfaction of the social aspect of the place. The two scales of the professor's way of treating the students and the method of establishing relationship between the university students have been selected according to EFQM questionnaire; also, the criterion of "professor's attention to the university students and his or her empathy and sympathy for the university students have been selected according to Servqual model.

B) Physical Factors: the physical dimension of a place has been investigated in EFQM questionnaire by the items related to access to the university as well as the adjustment of the place's physical properties with the students' needs. A part of the physical or tangible aspects of Servqual questionnaire is dedicated to the investigation of the physical dimensions of the place.

These factors include equipment in the classrooms such as desk and chair as well as the extents of the workshops, laboratories, prayer rooms and amphitheater. All of these indicators have been investigated based on being intuitive or sensory as well as according to the relationship between the building's inside and outside in five sets of color and light, materials and furniture, university campus, thermal comfort conditions, and acoustic comfort conditions.

C) Functional Factors: four indicators, namely the quality of the academic staff and administrative staff and facilities and regulations, were taken into account in evaluating the university's performance following the examination of the EFQM questionnaire and Servqual Model and after the classification of the related items.

In EFQM model, three scales of the quality of the university's facilities, academic staff and administrative staff, were proposed for the place's functional aspect. Based on the model, accessibility of the professors, accountability with inclinations towards the students, the match between the performance and needs of the students, knowledge level, teaching method, professors' competency and qualification were posited for evaluation of the academic staff. The way of treating others, the rate of inclination and speed in responding by the administrative staff and the amount of their knowledge and information in offering services to the university students were posited for evaluating the performance of the administrative staff. Moreover, the match between the facilities and equipment with the students' needs and fees received from them were posited for investigating the satisfaction with the complex's facilities.

In Servqual model, as well, the quality of the academic staff and quality of the administrative staff matter. The scientific level and quality of the teaching by the professors, satisfaction of the requested assignments and fast and proper responding to the university students were related to the evaluation of the performance of the academic staff; method of responding by the administrative staff and their knowledge and information in offering the services to the university students were considered for evaluating the performance of the administrative staff. Moreover, researches have been found highly emphasizing on the role of the suitable social relations in enhancing satisfaction with functional aspects (Rohe & Stegman, 1994, pp. 152-172; Cohen & Shinar, 1985). The results of the studies by Ghane'irad and Ebrahimabadi (2010) and Mosleh et al (2013) confirm the effect of the quality of social interactions in the academic settings on the performance of the students and professors. Furthermore, as viewed by the researchers, the effect of the physical factors of place on satisfaction is undeniable from the social and functional perspectives (Stedman, 2003, pp. 822-829; Ghaneirad & Ebrahim Abadi, 2010, pp. 1-27; Mosleh, Ghasemieh & Shafiee, 2014, pp. 135-156).

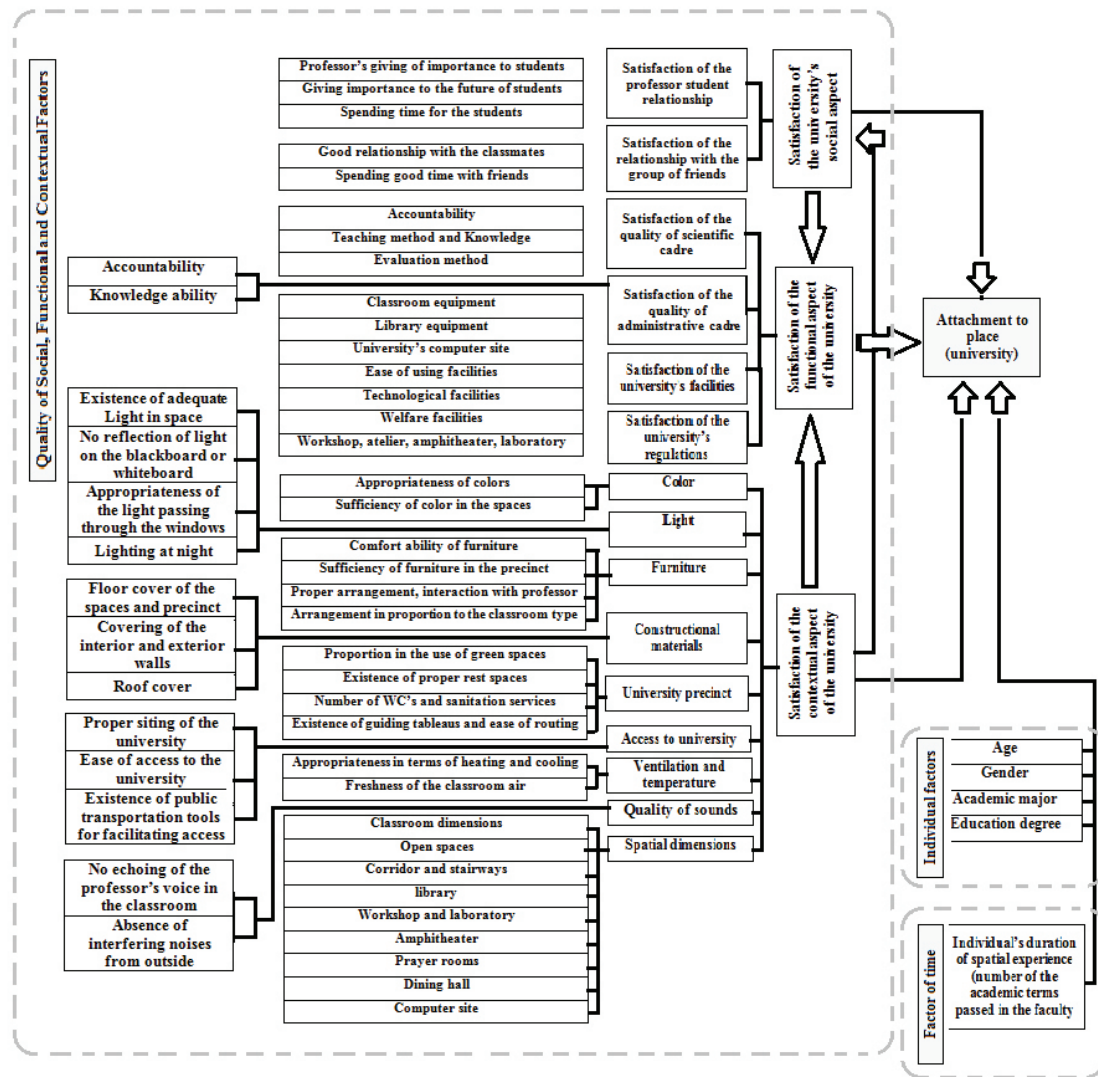


Fig. 1. Scales and Indicators Evaluated in the Present Article

Studies on the effect of the physical factors of space on the social interactions indicated that the university campus (Nozari, 2005, p. 39; Gehl, 1986, pp. 89-102; Yazdani & Teimouri, 2013, pp. 83-92), quality of access to spaces (Alitajer & Zareihajabadi, 2016, pp. 79-90; Peters, Elands & Buijs, 2010, pp. 93-100), proper furniture (Gehl, 1986, pp. 89-102), arrangement style of furniture (Sailer & McCuloh, 2012, pp. 47-58), sufficient spaces in proportion to the users' population (Gehl, 1986, pp. 89-102; Peters, Elands, & Buijs, 2010, pp. 93-100) and appropriate lighting and insulation (Alitajer & Zareihajabadi, 2016, pp. 79-90; Wang & Boubekri, 2009, pp. 15-25) are amongst

the most important physical factors influencing the quality of the social interactions in space. In addition, studies like the ones performed by Vischer and McCoy are well reflective of the effect of the physical environment, including accesses, furniture, color, decoration and spatial per capita on the performances of the individuals, especially staff. Based on the explicated theoretical foundations, the model of factors influencing attachment to university and the indicators that can be proposed for every factor are as shown in Figure (2) (Vischer, 2008, pp. 97-108; McCoy, 2005, pp. 91-169).



In the end, based on the confirmed model and investigation of the direct and indirect effect of each of the effective factors based on the path analysis method, an answer will be found for the question as to “which of the assumed factors plays the most accentuated role in the creation of the sense of attachment to university in the university students?”

The present study is of correctional research. The study population included the students of the Islamic Azad

Both of the questionnaires have been scored based on the Likert's 5-point scale (completely agree=5, agree=4, somewhat agree=3, disagree=2 and completely disagree=1). The data have been analyzed in SPSS, version 19. In order to investigate the reliability of the instrument, after codifying the initial questionnaire, 40 questionnaires were completed by the study sample volume and investigated based on the Cronbach's alpha in SPSS Software in the pretest stage.

Table 1. Results of Cronbach's Alpha Coefficient for the Test Instrument's Reliability

| Concept | Aspects | Test's Micro-coefficient | Total Coefficient |
|-------------------------------------|-----------------------------------------|--------------------------|-------------------|
| Sense of Attachment to Place | ----- | ----- | 0.813 |
| Satisfaction with the Place Aspects | satisfaction with the social aspect | 0.688 | 0.923 |
| | satisfaction with the functional aspect | 0.823 | |
| | satisfaction with the physical aspect | 0.910 | |

According to Table (1), the subtest of the satisfaction with social aspect has acceptable reliability (Cronbach's alpha coefficient in a range between 0.5 and 0.7). The rest of the subtests and tests were also found having

considerable reliability (Cronbach's alpha coefficient above 0.7). Based thereon, it can be claimed that both of the instruments used in the study and its subtests are acceptable in terms of reliability and accuracy.

Table 2. Investigating the Fit of the Study's Default Instrument

| Index Name | | Acceptable Fit | Good Fit | Attachment | Social | Functional | physical |
|------------------|-----------------------------------------|--------------------------------------------------------|--------------------------------------------------|------------|--------|------------|----------|
| Comparative fit | Non-Normed Fit | TLI \geq 90% (Hu & Bentler, 1999) | TLI \geq 95% (Hu & Bentler, 1999) | 96.6% | 101.5% | 94.6% | 89.9% |
| | Normed Fit | NFI \geq 90% | NFI \geq 95% (Schumacker & Lomax, 1996) | 97.0% | 99.7% | 95.4% | 97.6% |
| | Adaptive Fit | CFI \geq 90% | CFI \geq 93% (Bollen, 1989) | 98.0% | 100.0% | 97.2% | 99.5% |
| | Relative Fit | RFI \geq 90% | About 1 (Bollen, 1989) | 93.5% | 99.2% | 91.2% | 94.0% |
| | Incremental Fit | IFI \geq 90% | About 1 (Bollen, 1989) | 98.0% | 100.6% | 97.2% | 99.6% |
| Parsimonious fit | Normed Parsimony Fit Index | 50% about | 50% \leq PNFI (Ghasemi, 2010) | 58.3% | 58.3% | 50.0% | 39.0% |
| | Root Mean Square Error of Approximation | 5% \leq RMSEA \leq 8% (Hoyle & Panter, 1995) | 0% \leq RMSEA $<$ 5% (Hoyle & Panter, 1995) | 5.1% | 0.000% | 6.2% | 2.42% |
| | Chi-Square to Degree of Freedom | 2 \leq CMN/df \leq 5 (Schumacker & Lomax, 1996) | 0 \leq CMN/df $<$ 2 | 1.993% | 0.371% | 2.446% | 1.21% |

In this study, the validity was investigated based on the confirmatory factor analysis using Amos Software. The accuracy and fit of the model were examined through the values obtained for incremental fit index, non-normed fit index, relative fit index, normed parsimonious fit index, root mean square error of approximation and chi-square to degree of freedom and they were found in

a range of good to acceptable limits (Table 2) indicating the possibility of citation ability on the coefficients of factor load for investigating the validity of the study instrument. According to the fact that the factor loads of all the indicators are larger than 0.4 (P-value= 0.01), the validity of the study instrument is proved (Fig. 3).

Satisfaction with the University's Social Dimension

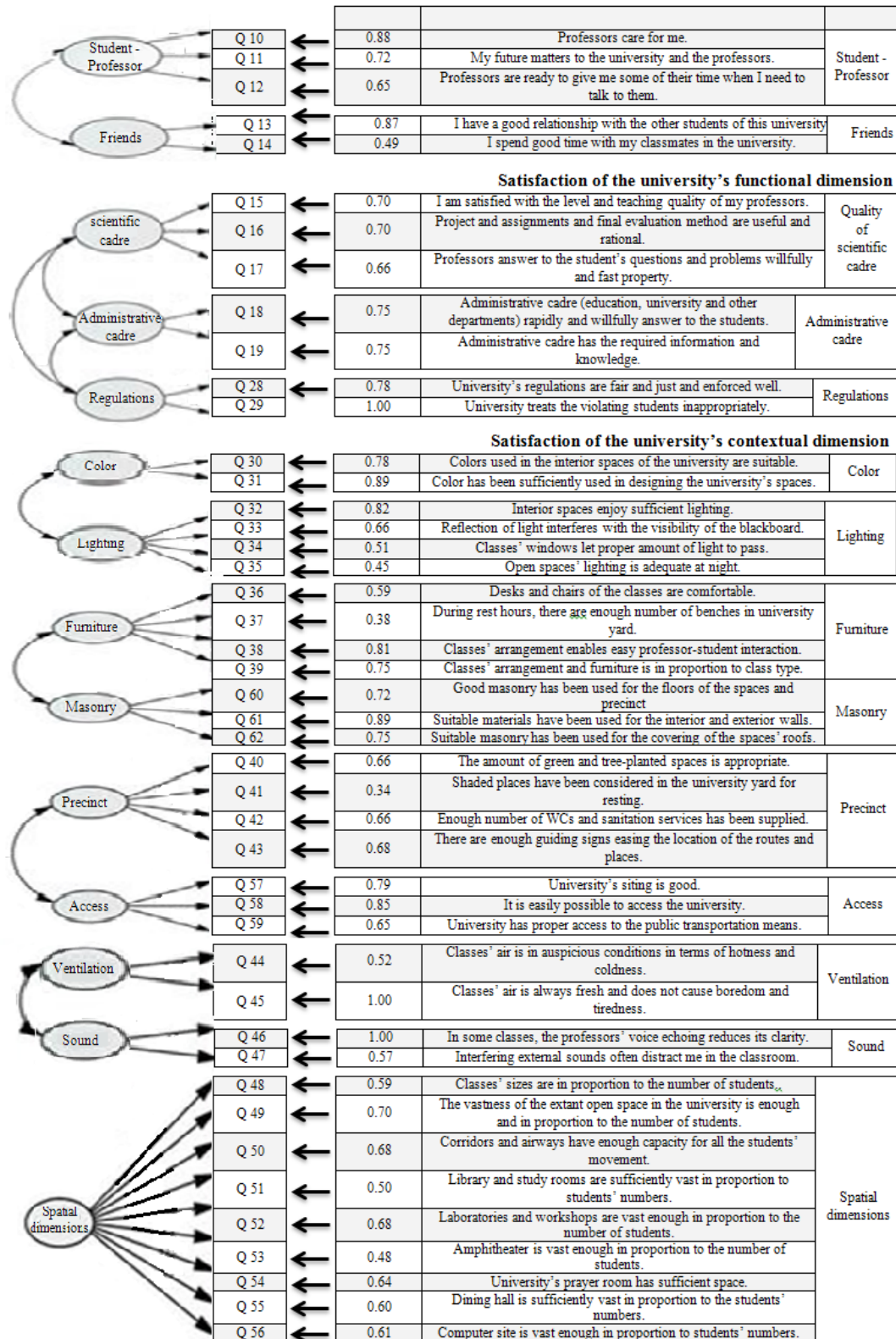


Fig. 3. The Results of the Confirmatory Factor Analysis of the Study Instrument

4. FINDINGS

To better understand the findings and results obtained from this study, they have been explored from two descriptive and analytical perspectives as summarized in Tables (3), (4) & (5).

4.1. Descriptive Findings

It was observed in regard to the background variables that the respondents are in an age range from 18 to 40 and 56.4% of them are female and 43.6% are male. Additionally, 32.4% of the respondents were studying in art and architecture major; 39.4% were

studying in technical-engineering major and 28.2% were studying in basic sciences major and only 4.8% of the respondents were non-native students. In order to describe the dependent and independent variables, the data were divided into three sets of low (1-2.32), intermediate (2.33-3.65) and high (3.66-5) and the frequency percentage related to each set was calculated. The results of investigating the sense of attachment to the place in respondents indicated that the attachment level of the students to the university is generally at the intermediate level and that the university students are moderately satisfied with the university's social, physical and functional aspects (Table 3).

Table 3. Frequency of Respondents in Separate of the Level of Attachment to the Place

| Scale | High | | Intermediate | | Low | |
|-----------------------------------------|--------|------------|--------------|------------|--------|------------|
| | Number | Percentage | Number | Percentage | Number | Percentage |
| Sense of Attachment to Place | 67 | 17.8% | 229 | 60.9% | 78 | 20.7% |
| Satisfaction with the Functional Aspect | 16 | 3.4% | 235 | 62.5% | 78 | 23% |
| Satisfaction with the Social Aspect | 80 | 21.3% | 249 | 66.2% | 47 | 12.5% |
| Satisfaction with the Physical Aspect | 21 | 5.6% | 217 | 57.7% | 121 | 32.2% |

4.2. Analytical Findings

The first and the second hypothesis of the study indicated the existence of positive and significant relationships between the background variables, including gender, academic degree, education term and faculty place of education, with the sense of attachment to a place and satisfaction of the threefold factor. The results are as presented in Table (4). In this regard,

use was made of Student's t-test for investigating the binary variables like gender (male/female) and academic degree (B.A./M.A.) and also use was made of one-way variance test for exploring the variables featuring more than two modes like the education term (freshman/sophomore/junior/senior) and the studying school (technical-engineering/basic sciences/art and architecture departments).

Table 4. Significance Tests of the Relationships between the Contextual Properties and Sense of Attachment and Satisfaction of the Place in the Studied Individuals

| Independent Variables | Dependent Variables | Test Type | Test Value | Significance Levels | Test Result |
|-----------------------|-------------------------------------|------------------|------------|---------------------|-------------|
| Gender | Sense of attachment to place | Student's T-Test | - 0.425 | 0.671 | Reject |
| | Satisfaction with social aspects | | - 1.537 | 0.175 | Reject |
| | Satisfaction with functional aspect | | - 1.928 | 0.055 | Reject |
| | Satisfaction with physical aspect | | - 2.33 | 0.143 | Reject |
| Education Degree | Sense of attachment to place | Student's T-Test | -1.33 | 0.185 | Reject |
| | Satisfaction with social aspects | | -1.66 | 0.064 | Reject |
| | Satisfaction with functional aspect | | 0.406 | 0.01 | Confirm |
| | Satisfaction with physical aspect | | 1.39 | 0.162 | Reject |

| | | | | | |
|----------------------------------|----------------------------------------|------------------|--------|-------|---------|
| Education Duration in Faculty | Sense of attachment to place | One_Way ANOVA | 4.008 | 0.003 | Confirm |
| | Satisfaction with social aspects | | 2.618 | 0.006 | Confirm |
| | Satisfaction with functional aspect | | 2.520 | 0.008 | Confirm |
| | Satisfaction with physical aspect | | 1.187 | 0.302 | Reject |
| Studying Faculty | Sense of attachment to place | One_Way ANOVA | 10.488 | 0.000 | Confirm |
| | Satisfaction with social aspects | | 8.062 | 0.000 | Confirm |
| | Satisfaction with functional aspect | | 9.436 | 0.000 | Confirm |
| | Satisfaction with physical aspect | | 22.991 | 0.000 | Confirm |

In order to test the other three hypotheses, correlation coefficients' matrix (Table 5) of the proposed effective indicators and sense of attachment to place has been drawn. Considering the correlation coefficient, all of the intended indicators pertaining to the functional

and social aspects of the place have positive and significant relationships with the students' sense of attachment. As for the physical factors, as well, only the spaces' acoustic considerations were found lacking a significant relationship with this sense.

Table 5. Correlation Coefficients Matrix

| | Physical Aspect of the Place | | | | | | | | | Functional Aspect | | | | Social Aspect | |
|-------------------------|------------------------------|--------|------------|--------|-------------|----------|-----------|--------|--------|-------------------|-------------|-------------------------|---------------------|---------------|-----------------------|
| | Masonry | Access | Dimensions | sound | Temperature | Precinct | Furniture | Light | Color | Facilities | Regulations | Administrative cadre | Scientific cadre | Friends | Professor Students |
| Masonry | 1 | | | | | | | | | | | | | | |
| Access | **0.308 | 1 | | | | | | | | | | | | | |
| Dimensions | **0.597 | 0.207 | 1 | | | | | | | | | | | | |
| Sound | -0.061 | -0.090 | -0.79 | 1 | | | | | | | | | | | |
| Temperature | **0.465 | -0.253 | -0.621 | -0.08 | 1 | | | | | | | | | | |
| Precinct | **0.497 | -0.252 | -0.643 | -0.071 | -0.470 | 1 | | | | | | | | | |
| Furniture | **0.547 | -0.185 | -0.609 | 0.013 | -0.652 | -0.593 | 1 | | | | | | | | |
| Light | **0.365 | -0.128 | -0.341 | -0.130 | -0.205 | -0.351 | -0.405 | 1 | | | | | | | |
| Color | **0.545 | -0.142 | -0.631 | 0.081 | -0.380 | -0.492 | -0.670 | -0.455 | 1 | | | | | | |
| Facilities | **0.372 | -0.121 | -0.463 | -0.051 | -0.341 | -0.481 | -0.441 | -0.278 | -0.352 | 1 | | | | | |
| Regulations | **0.390 | -0.154 | -0.265 | -0.118 | -0.237 | -0.252 | -0.248 | -0.181 | -0.250 | -0.385 | 1 | | | | |
| Administrative Cadre | **0.117 | -0.132 | 0.078 | 0.044 | -0.172 | -0.127 | -0.454 | 0.086 | -0.188 | -0.335 | -0.235 | 1 | | | |
| Scientific Cadre | **0.137 | -0.180 | -0.141 | -0.024 | -0.213 | -0.192 | -0.283 | -0.204 | -0.173 | -0.298 | -0.216 | -0.491 | 1 | | |
| Friends | 0.042 | 0.044 | -0.122 | -0.02 | -0.187 | -0.186 | -0.105 | 0.010 | 0.062 | -0.159 | -0.259 | -0.110 | -0.260 | 1 | |
| Professor | -0.012 | -0.136 | 0.005 | -0.087 | -0.144 | 0.070 | -0.150 | 0.062 | 0.059 | -0.180 | -0.117 | -0.445 | -0.857 | -0.200 | 1 |
| Sense of Attachment | **0.243 | -0.208 | -0.334 | -0.006 | -0.281 | -0.328 | -0.275 | -0.203 | -0.256 | -0.398 | -0.387 | -0.320 | -0.451 | -0.367 | -0.379 |

*Significance in 0.05 level;

**significance in 0.01 level

4.2.1. Elaborating the Predictor Environmental Factors

In this section, use is made of multivariate regression test to determine the explanatory factors of the sense of attachment to place and the quotient of the direct effect of each of the independent variables on the dependent variable. According to the absence of the collinearity problem, the variables simultaneously entered in the regression equation and the changes of the dependent variable were specified per unit of change in the independent variables.

Considering the summary of the regression model, the Durbin-Watson statistic was found in a range between 1.5 and 2.5; therefore, the error independence assumption which is amongst the regression presumptions holds. Moreover, considering the significance level of F-statistic (below 0.05), the independent variables explain well the changes in the dependent variable. According to the fact that the minimum amount of tolerance statistics is 0.4 and the maximum variance inflation factor (VIF) is equal to 2.5, the non-collinearity assumption was also found

holding. Based on the regression results, the multiple correlation coefficient is equal to 0.65 indicating the intensity of the relationship between the dependent variable and independent variables. Furthermore, the

correlation coefficient's square root shows that the variables entered into the regression model account for 43.4% of the changes in the sense of attachment to university (Table 6).

Table 6. Summary of the Regression Model and Variance Analysis

| Model | Sum of Squares | Degree of Freedom | Mean Squares | F-Statistic | Significance Level | Correlation Coefficient | Correlation Coefficient's Square Root | Modified Correlation Coefficient's Square Root | Durbin-Watson Test |
|------------|----------------|-------------------|--------------|-------------|--------------------|-------------------------|---------------------------------------|------------------------------------------------|--------------------|
| Regression | 99.996 | 18 | 5.555 | 15.862 | 0.000 | 0.673 | 0.454 | 0.425 | 1.82 |
| Residual | 120.478 | 344 | 0.350 | - | - | - | - | - | - |
| Total | 220.474 | 362 | - | - | - | - | - | - | - |

The results of regression analysis indicated that the following aspects directly influence the students' sense of attachment to university: the relationship with friends and professors as components of the university's social aspect and services offered by the academic staff, university regulations and university facilities that actually constitute the functional aspect of the place. This is while only spatial dimensions of the place's physical aspects were found directly influencing the students' sense of attachment to

university. The multivariate regression analysis equation of the sense of attachment to academic environments is as shown below (Table 7):

Attachment to the academic environment = 0.219 (relationship with friends) + 0.116 (services offered by the academic staff) + 0.124 (regulations) + 0.121 (university's facilities) + 0.140 (spaces' dimensions) + 0.125 (the quality of the professor-student relationship) + 0.157 (academic major) - 0.423.

Table 7. Results of Simultaneous Multivariate Regression

| Regression model | Regression coefficients | | | | | Collinearity statistics | |
|----------------------------------|-----------------------------------|----------------|---------|-------------|--------------|-------------------------|-------|
| | Non-standardized beta Coefficient | Standard error | Beta | T-statistic | Significance | Tolerance | VIF |
| Fixed Value | 0.423 | 0.222 | - | 1.908 | 0.057 | - | - |
| Relationship with Friends | 0.219 | 0.038 | 0.250 | 5.752 | 0.000 | 0.834 | 1.198 |
| Services of Academic Staff | 0.116 | 0.053 | 0.130 | 2.199 | 0.029 | 0.447 | 2.237 |
| Services of Administrative Staff | 0.041 | 0.037 | 0.056 | 1.123 | 0.262 | 0.641 | 1.559 |
| Regulations | 0.124 | 0.039 | 0.147 | 3.174 | 0.002 | 0.732 | 1.366 |
| University's Facilities | 0.121 | 0.050 | 0.128 | 2.432 | 0.016 | 0.567 | 1.762 |
| Color of the Spaces | 0.017 | 0.041 | 0.023 | 0.412 | 0.681 | 0.509 | 1.966 |
| Spaces' Lighting | 0.081 | 0.046 | 0.084 | 1.758 | 0.080 | 0.685 | 1.459 |
| Spaces' Furniture | - 0.084 | 0.055 | - 0.092 | - 1.512 | 0.131 | 0.422 | 2.368 |

| | | | | | | | |
|------------------------------------------------|---------|-------|---------|---------|-------|-------|-------|
| University Campus | 0.000 | 0.051 | 0.000 | - 0.08 | 0.994 | 0.446 | 2.242 |
| Temperature and Ventilation of Interior Spaces | 0.015 | 0.040 | 0.020 | 0.376 | 0.707 | 0.581 | 1.723 |
| Dimensions of the Spaces | 0.140 | 0.54 | 0.161 | 2.601 | 0.010 | 0.412 | 2.425 |
| Ease of Access to University | 0.039 | 0.030 | 0.057 | 1.311 | 0.191 | 0.825 | 1.212 |
| Applied Materials | 0.010 | 0.043 | 0.013 | 0.234 | 0.815 | 0.505 | 1.979 |
| Relationship between Professor and Students | 0.125 | 0.044 | 0.162 | 2.829 | 0.005 | 0.479 | 2.089 |
| Education Term | 0.008 | 0.014 | 0.025 | 0.571 | 0.568 | 0.829 | 1.206 |
| Major or Department of Education | - 0.157 | 0.044 | - 0.157 | - 3.543 | 0.000 | 0.803 | 1.245 |

Next, in order to recognize the indices that have indirect effects on the independent variables, use was made of path analysis. To do so, based on the conceptual model, six variables related to the functional and social aspects of the place were

considered as the endogenous variables and the variables of the physical aspect were assumed as the exogenous variables. Table (8) gives a summary of the results obtained from the analysis of the direct, indirect and total effects.

Table 8. The Amount of the Direct and Indirect Impacts of Indices

| Variable | Direct Effect | Indirect Effect | Total Effect |
|------------------------------------------------|---------------|-----------------|--------------|
| Relationship with Friends | 0.250 | 0.104 | 0.354 |
| Services by Academic Staff | 0.130 | - | 0.130 |
| Regulations | 0.147 | 0.052 | 0.199 |
| University Facilities | 0.128 | - | 0.128 |
| Spaces' Color | - | 0.153 | 0.153 |
| Spaces' Light | - | 0.118 | 0.118 |
| Spaces' Furniture | - | 0.108 | 0.108 |
| University Precinct | - | 0.038 | 0.038 |
| Temperature and Ventilation of Interior Spaces | - | 0.134 | 0.134 |
| Spaces' Dimensions | 0.161 | 0.129 | 0.290 |
| Student-Professor Relationship | 0.161 | 0.069 | 0.230 |
| Faculty of Education | - 0.157 | - 0.117 | 0.274 |

According to the results of this table, two indicators of satisfaction with the relationship with friends and spatial dimensions and proportions had the largest impact and satisfaction with the university campus had the lowest impact on the students' sense of

attachment to the university. Considering the path coefficients, the model of the factors influencing the creation of a sense of attachment is as illustrated in Figure (4).

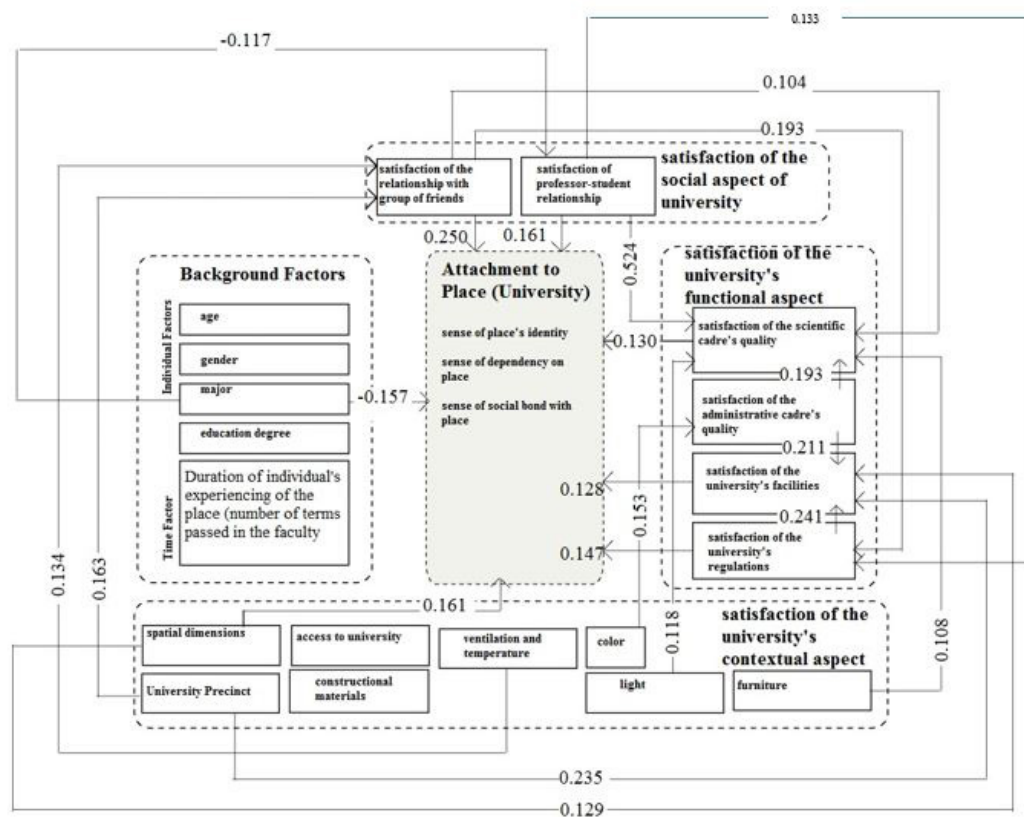


Fig. 4. The Explanatory Model of Factors Influencing the Students' Sense of Attachment to the University Using Path Coefficients

5. DISCUSSION AND CONCLUSION

The objective of the present study was to elaborate a model for identifying the environmental factors influencing the students' sense of attachment to the university. Considering the existing theoretical foundations in this regard, satisfaction with the functional, social and physical dimensions of place along with the contextual factors were assumed as four factors influencing the sense of attachment to the place and the conceptual model was drawn based on the following assumptions:

- Four factors of social satisfaction, functional and physical aspects and contextual factors directly influence the students' sense of attachment.
 - Besides influencing the sense of attachment, the contextual factors also influence the students' satisfaction with the triple aspect of the place.
 - Satisfaction with the physical aspect is effective in satisfaction with social and functional aspects, and satisfaction with social aspect influences the satisfaction with the university's performance.
- Next, the proposed model will be tested using the study hypotheses within the scale of the explained indicators.

The first hypothesis was related to the effect of the contextual factors and its test results that gender and

students' education degree have no effect on their attachment to the university.

The second hypothesis was related to the effect of contextual factors on the satisfaction with the university. Its test results indicated that the students' education degree is effective in their satisfaction with the university's performance; students' education terms are effective in their satisfaction with social and functional aspects and faculty of education are effective on all three physical, social and functional aspects.

The third hypothesis was related to the effect of satisfaction with physical, functional and social aspects on the sense of attachment to university and the results indicated that only the acoustic quality of the spaces has no effect on the sense of attachment to the place amongst the proposed indicators.

The fourth hypothesis pertained to the existence of significant relationship between satisfaction with the university's social and functional aspects and, considering the significance of the correlation coefficients, the positive and significant relationship between all the indicators is proved so it can be claimed that the increase in the satisfaction with social aspect in the university environment would result in the increase in the satisfaction with performance.

In the end, the effect of satisfaction with physical

factors on the satisfaction with the two social and functional aspects of the place was also investigated. The results indicated that the increase in the quality of such factors as lighting and dimensions results in an increase in the students' satisfaction with the university's performance and also the increase in the quality of furniture and thermal comfort conditions, spatial dimensions and ease of access to the university causes the quality of the students' social interactions to be increased in the university. In order to determine the direct and indirect role

of each of these factors in explaining the sense of attachment to a place, use was made of regression analysis and path analysis. Corresponding to the results, the quality of the student-student and professor-student relationships, spatial dimensions, university's regulations, quality of academic staff and university's facilities respectively have the highest to the lowest direct roles in the explanation of the sense of attachment in the university students. The role of the other indicators is played indirectly and by the intermediation of the aforesaid indicators (Fig. 5).

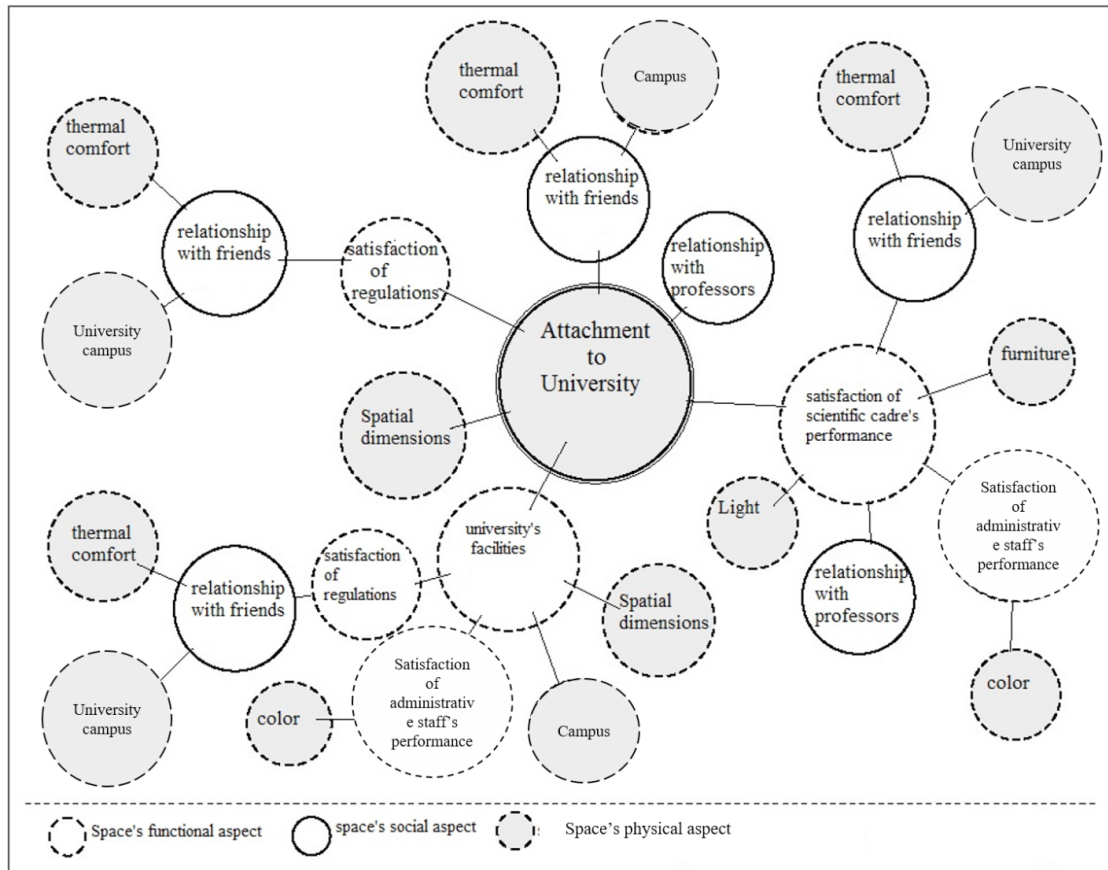


Fig. 5. Diagram Showing the Method of Physical Environmental Factors' Influence on the Sense of Attachment to the University

Based thereon, the social aspect had generally the highest effect on the creation of a sense of attachment to university and the physical aspect indirectly led to strengthening the link between the student and university through strengthening the two functional and social aspects of the university (Fig. 5). Therefore, it can be stated that:

- The match between the quality of the university campus and the students' expectations (precinct factor) as well as the existence of the thermal comfort conditions inside and outside the spaces (temperature and ventilation factor) cause the strengthening of the students' relationships with their friends. In fact, this finding can be understood in the following words: the university students choose open or closed spaces

for their social interactions according to the thermal comfort conditions. During hours of the day that the open space is not in favorable thermal conditions, closed space forms the basis of the social interactions' occurrence. Enhancement of the social interactions between the students leads to the increase in the students' sense of attachment to the place with the role that it plays in increasing the students' acceptance of regulations and their satisfaction with the professors' performance. These results are consistent with those obtained in the studies by Yazdani and Taimuri (2012) and Nowzari (2004) and Gahel (1987) who underlined the role of open spaces and campus as social interaction predisposing factors.

- Interior spaces' appropriate enjoyment of the natural and artificial light (lighting factor) and suitability of the classrooms' furniture and their arrangement style (furniture factor) results in the university students' attachment to the place via increasing the students' satisfaction with the quality of scientific staff (Shahcheraghi & Bandarabad, 2015, p. 200). In fact, since light leads to lower anxiety, higher efficiency, and stronger environmental perception, it has a positive effect on the quality of the professors' performance. Moreover, the spaces' enjoyment of sufficient lighting and a suitable arrangement of the classrooms' furniture lead to the improvement of the students-professors interaction. These factors altogether cause strengthening the learning and teaching processes as a result of which the university students will be found more satisfied with the professors.

- Sufficient use of the color in spaces influences the performance of the staff and professors and brings about more satisfaction in the students with the quality of the administrative staff and professors' performance and resultantly causes more interest in the university in students. In fact, as expressed in the results of the study by Vischer (2008), as well, the application of the proper colors causes an improvement in the staff's performance and their way of treating the clients and this brings about more satisfaction with the performance of the administrative staff in the university students.

- Besides creating a sense of attachment to the university directly, paying attention to the spatial dimensions will be also indirectly followed by the increase in the attachment to the university through enhancing the students' satisfaction with the university's facilities, including library, amphitheater, prayer rooms and so forth. In fact, the spatial dimensions in proportion to the number of students make the students feel that the university has provided them with more facilities and such a sense of satisfaction with the provided facilities increases the students' sense of attachment to the university. considering the fact that the two factors of the students' relationship with friends and spatial

dimensions have been identified as the most effective factors in creating a sense of attachment to the university in students, two practical recommendations are suggested below in line with increasing the students' level of interest in the university:

A) According to the fact that the relationship between the university students and their friends is of great importance in regard of their sense of attachment to the university, it is suggested that more attention should be paid for strengthening the grounds of these interactions to the socialization features of the spaces wherein these interactions can come about as well as to the environmental factors enhancing this aspect (university precinct and thermal comfort conditions).

B) The first important physical factor is the spatial dimensions that should be more carefully taken into account in the process of the physical planning of the academic spaces. These dimensions are not solely limited to the classrooms rather, as shown in the results, observance of the proper dimensions of the gathering spaces like yard, amphitheater, prayer room as well as the connective spaces like corridors and stairways, directly and indirectly, result in the students' attachment to the university. Constructing these spaces in proper dimensions reduces the feeling of congestion and brings about the positive perception of the artificial environment. It is in this way that the sense of place and sense of identification with place are created in the individuals and outcomes like the sense of attachment to place, more participation, commitment and responsibility, and diligence will subsequently follow. The students' enjoyment of such characteristics is of great importance in higher education environments. Thus, it is suggested that the spaces are quantitatively allocated to the land uses according to the per capita rates. furthermore, the students' satisfaction with the spatial dimensions should be evaluated in the current status of the universities through polling so as to identify the inappropriate spaces for taking future measures in line with the correction and improvement of them.

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