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Analyzing the socio-spatial construction of a university campus:
Aegean university as public space of student community

Berna Yaylalı-Yıldız
IzTECH / bernayaylali@iyte.edu.tr

Ela Çil
IzTECH / elacil@iyte.edu.tr

Işın Can
IzTECH / isincan@iyte.edu.tr

Pınar Kılıç-Çalğıcı
IzTECH / pinarkilic@iyte.edu.tr

Abstract

Qualities of the campus as a place and its role as a space for different types of interactions have been discussed in the literature as important parameters of academic life (Kumar, 1997; Chapman, 2006). Although how the spatial organization of campus generates interaction has generally been discussed within the scope of knowledge production, there is a body of research concentrating on the role of spatial configuration and land use decisions for the enhancement of public life in campuses (Whisnant, 1979; Griffith, 1994; Ghazalah, 2007; Goldfinger, 2009). Among these researches, there is growing literature in space syntax studies (Greene and Penn, 1997; Nunes, 2007; Adyha, 2009; Kim 2009; Schwander et al., 2012). In this paper we aim to contribute to this literature by analyzing the Aegean University (Ege Universitesi) Campus in Izmir, Turkey.

Aegean University was the second campus university in Turkey when it was established in 1955. Planned with the concept of a single and self-sufficient campus on an area of 370 hectares, it was located on an available land outside the city and at the periphery of Bornova, the district in the north part of ?zmir. With a student population of 53.000 in total, campus of the university is like a small town with eleven faculties, eight institutes, an academy of music, and seven vocational schools. With the growth of the city, now the campus is surrounded with the new neighborhoods. Additionally, an open air shopping center was constructed in 2006 within the premises of the campus, offering 45,000 m² of shops (including IKEA), restaurants, movie theaters. These developments and the construction of a new metro station in the campus started to change the dynamics of accessibility of the university, which, in fact, has been controlled through four gates.

In this study, we present two aspects of the public life of the university: Firstly, we analyze the relationship of the campus with its surrounding through the questionnaire that we conducted with the students and the syntax analysis of the campus including its environment. Secondly, we juxtapose the results of the morphological analysis of the university focusing on the role of spatial configuration of the campus for students' interaction with the observations of outdoor activities and the questionnaire. The syntax and land use analysis of campus show that the spatial configuration of campus create zones in the campus working as self-sufficient settings and these are integrated with long axial lines, that make the campus car dependant. Also, observation of student life shows that students prefer to go to Bornova for local restaurants and pubs in the district next to the campus.

Since the 2000s there is an accelerated construction of universities; and 28 out of 41 universities

inaugurated so far are planned as single campuses with the concept of isolation of students from surrounding contexts. We believe that the results of our study will contribute to both the studies and the spatial practices related with campus life.

Keywords: *public space, university campus life, spatial configuration, student interaction, Aegean University*

Theme: *Urban Space and Social, Economic and Cultural Phenomena*

1. Introduction

This paper explores the spatial potentials of university campuses for supporting and sustaining public practices in their premises. Particularly we examine the role of physical space in producing and sustaining cultural, social, and political activities that produces publicness in the university campus. We contend that co-presence and interaction are the fundamental conditions for creating the virtual community for such practices, and most of the activities are generally nourished by gatherings in extracurricular activities. Through a socio-spatial analysis of students' practices on campus, as well as a syntactic analysis of the campus layout we question how the physical space of university influences the character of campus life outside the classroom. Although there have been studies that analyze public spaces and their effect to collective practices, university campuses are absent from the recent discussions in public space literature. Little has been said about socio-spatial relations within university campuses and how the university as a public institution contributes to the formation of different form of collective practices. This study aims to contribute to this growing literature through a case study conducted in the campus of Aegean (Ege) University, which a public university Izmir, Turkey.

The role of universities for the production of knowledge and as a major contributor to public sphere in general has been largely discussed in the literature (Delanty 1998, 2001a, 2001b, 2005; Calhoun 2009, Pusser 2006, Readings 1996). Although these debates open a gateway for discussing the capacity of the university to stimulate a divergent social life in campus, they leave out three questions: the types of publicness that may occur in the university campuses, how such public life is produced, and the role that its spatial organization plays on that life. Rather, the discussions have mostly focused on generation of knowledge and its relation to public sphere. This study addresses a less explored issue.

In the first part of the paper, we review a body of literature that focuses on how different aspects of public life emerge in campus and the studies that examine the relationship between the spatial configuration of campuses and some parts of a public life. The second part presents the case study of Aegean University.

2. Literature Review: Public Space and Public Life in the University Campus

In the contemporary world, ideal campus environment has a unique physical environment that goes beyond merely for learning and teaching facilities. Universities reiterate to use a certain type of physical form and relation with the surrounding fabric that generates more unique ways of social and political constructions from those found in public spaces such as city centers, streets or other public spaces. Physical space of the university has an influence on the character of its institutional as well as social life, potentially reinforcing or undermining important public goals and missions. Offering a complete collection of functions such as living, studying and retail, universities are autonomous regions and like self-contained small cities. In that respect, it features some of city's functions. However, although university seems to share a number of physical similarities with city, they are different places. Although today physical form and location preferences change, universities following American campus model are mostly located in greensward surrounding. Comparing to the cities, with their mostly green and noise free atmosphere (Gumprecht, 1993), university campuses promote pedestrian friendly environment for extra-curricular activities. Indeed, location of educational facilities in this "sheltered and defensive structure" serves for the concept of academic life, promoting to reach a maximum of concentration and isolation from complexities of urban life (Halsband, 2005). Also, this green infrastructure turns this educational institution into public space both for their communities and for the city.

In public spaces in the form of open recreation areas, plazas, squares, sport and conference halls, libraries, cultural centers, and cafeterias, people of university can liaise and produce different types of social interaction (Kezar, 2005:54). Public spaces whose rhythms are defined by curricular activities (Christ, 2005) encourage academicians and students to participate into the co-curricular activities; provide relief from the stresses of busy working time. As in the cities, people from different disciplines and social groups can come together in a supportive context of mutual enjoyment (Carr, 1992: 344). Bringing together different groups, being a platform of different ways of thinking can be the most important contribution of space to the collective life in universities. Public spaces become even more effective when they give chance to random encounters and interaction between academicians and students. Assuming that university is place of discovery and learning is a social activity in this environment, random encounters in public spaces increase possibility of talking, discussing and learning. Perhaps outside the lecture halls; in open spaces, cafeterias and libraries, etc. random encounters among students lead them to get into contact with others, learn new things and also discover self and others in the same settings.

Describing its distinct social and functional character unlike the other districts in city, Zelinsky identify the social environment of colleges and universities as "the voluntary regions" (Zelinsky, 1973). With its self-selected groups of like-minded and mobile individuals joining together in pursuit of knowledge, the university improvises a fresh cultural milieu (p. 136). Also, with a predominance of population between 18 and 25 years old (Gumprecht, 1993), university campuses are youthful places reiterating a sort of active public environment including practices and the knowledge which public is interested, produced and shared. Universities also contribute in multiple ways to the production of public realm and public life interchangeably. According to Bender, "No other institution has such rich connections at once to a local intellectual, political and social milieu and to a global network of ideas, structures and powers" (1998: 27-28). As Gumprecht declares, nourished by "green environments" and "a greater extent of public behavior" that has livened up by a dominant young population, an active public life emerges in the university settlements (Gumprecht, 1998). Although the primary purpose of social practices is to develop individual or academic pursuits, university provides a distinct public place for "a diverse society to form itself into a public culture even if only as a temporary creation" almost in a daily basis, whether in classroom, cafes or in front of buildings (Bender, 1998: 26). This shared public culture, for Bender, is based on dialogue and difference. This is also what Kumar stress as the informal side of university life, not as a residual but a unique nature of university experience (Kumar, 1997: 31).

Apart from the studies that open a debate for university campuses as unique places, having potentials that go beyond the limits of an institution, engaged with researching, generating specified knowledge, and teaching a profession, there are studies that explore the relationship between public realm and universities in general. In these, there are two groups of debates that draw attention to the significance of universities to the production of publicness. The largest body of studies focuses on the changing type of contributions of universities to the regions and cities, which they are located (Chatterton 2000, Hopkins 2011). In this understanding, universities are also *engaged institutions* with their public missions. With their growing economic and physical impact on community development -employment, spending, work-force development- (Bowman, 2011:14) and expanding their missions "to be about the public good, public things and public space, serving for the broader public" (Maurrasse 2001: 56), they take a more effective role in the development of a university and city relationship. In that respect, for Bender campuses moved simply being "in a city" to be "of the city" that have turned to the major drivers of cultural, economic and political relationship (Bender, 1998). Clark Kerr launches the term as the "multiversity" in order to identify the new structure of university (2002: 15). Kerr uses this term both to stress its increasing scale and also functions and activities, which the universities operate. For example, they ran medical and agricultural services for their host cities.

Locating public libraries, assembly halls and sports arenas, universities sustain a broad range of options for public facilities not only for their communities but also host cities they inhabit.

The other group of studies formulates campus as a political arena. The debates defining campus as the *political arena* illustrates its premise for the development of a democratic public sphere where students and other communities in the campus gain a "public voice and come to their grips" (Giroux 2002: 182). Defending university to the rising pressures of market, cultural theorist Henri Giroux insistently points the importance of university because it is one of "few public spaces left where students can learn the power of questioning authority, recover the ideals of engaged citizenship reaffirm the importance of the public good and expand their capacities to make a difference" (Giroux, 2002: 452). Echoing the ideal of John Dewey, Margaret Kohn similarly states that "universities-particularly public universities-were originally founded as schools of citizenship in which students learned to become competent participants in democratic governance." (Kohn, 2004:31). This is the promise of higher education: students who are supposedly free from requirements of earning money, they have chance to develop their skills, *discover* themselves with others and *display* themselves as social and intellectual agents within a public realm. Educator Brian Pusser moves the debate beyond to stress the importance of campus as a *political public space* where disparate actors come together for open conversation and collaboration (Pusser, 2006:19). For Pusser, campus is not only a site of intellectual community; it is also a physical site for public actors within and beyond the physical borders of campuses in which contests can take place outside the control of market interests (Pusser, 2004, 2006).

Both the literature discussing how the universities produce public means for the cities explores the importance of university in contributing to the formation of a public sphere. Although these studies open a gateway for discussing the capacity of the university to generate publicness, they leave out the question on how such publicness occurs in the university life and how spatial character of campus influences the publicness. In debates, the notion of publicness which has emerged in academic activities of university or public life in campus is an abstract realm which is totally marginalized from the internal geographies and structures of the campus (Hopkins, 2011). Also, field work questioning relations between spatial characteristics of university campuses and formation of public realm have been relatively rare. Nevertheless, there is a body of research focusing on the spatial characteristics of universities concentrating on the role of space for the enhancement of the interaction and diversity in campuses (Ghazalah, 2007; Goldfinger 2009, Gumprecht 2003, 2007).

Space Syntax Analysis of University Campuses

Among this body of research, there is a growing literature in the space syntax research. While a group of studies in that area concentrates on the relation between campus community and community of its surrounding environment (Srouri, 2005; Adhya, 2009), another group concentrates on orientation problems within the campus street systems (Trigueiro et al, 2009; Barros et al., 2009). In this paper we are especially reviewing the studies that investigate distribution of people to the use of open space with analysis of different campus configurations (Greene and Penn, 1997; Nunes, 2007; Kim 2009; Schwander et al., 2012).

Greene and Penn (1997) show the impact of spatial structure of university campus to the flow of technology. They present that the more integrated the academic units, the more academics know each other and the students, and the higher their frequency of contact with the students and academics of other academic units. Related with the differences in the global and local integration of a campus they relate powerful local integration in the absence of global integration to reinforce local integration forming largely student-student interaction and solidarity formation. Investigating reasons of isolation in clustered departments from the

campus, Nunes (2007), compares the results of spatial analyses of the campus with the results of interviews conducted with the students to understand the influence of spatial configuration for segregation. As Nunes' findings show, although majority of the students evaluated open green places of the campus positively green areas are underutilized in reality. Nunes indicates that this is due to the morphological problems in the planning of the campus. Long distances between the spaces where many activities evolve, large free areas between buildings make, not only the green areas, but also, using open spaces for public activities difficult. Presenting a detailed analysis of central plazas of two campuses, Kim (2007) investigates the reason of different kinds of vitality produced in two plazas. By examining the role of spatial configuration of these plazas in the movement patterns of students, Kim argues that different spatial organizations of the plazas create different types of interaction in campuses. In addition to the plazas' different levels of integration; number of people using the plazas regularly and the different events developing in and around them are defined as the other reasons of difference in spaces' vitality. Although Kim analyzes movement patterns of people to measure vitality in the plazas, she does not describe the kind of practices that produces liveliness in these urban squares or what the elements of vitality can be. Parallel to Greene and Penn, Schwander et al., focus on the spatial configuration of two different campuses of new universities that are built with an interconnected university model with the intention to foster encounters and informal communication of people from different disciplines. Conducting a microanalysis of open spaces in two campuses, they aim to understand the potentials of these spaces for interdisciplinary communication.

These studies address how the spatial organization of a university campus influences the use of open spaces that have the potential to influence different types of interactions among people. However, different kinds of practices that produce publicness in campuses and the way in which open spaces in a separate campus -outside the city- generate different forms of publicness are not yet fully analyzed. Although these researches investigate the relation between space and changing movement patterns by quantitative methods, they don't fully explore the spatial choices of students for stationary practices in the campus.

A rethinking on what kind of public practices are experienced in collective spaces which have different physical and spatial characteristics may help us better understand the role of campus layout and its relation to different dimensions of a vivid public life.

In this respect, this study aims to further aforementioned researches with juxtaposing different methods of analysis as well as focusing on the different practices constituting public life.

3. The Case Study: Aegean University in Izmir

Today, there are currently 168 higher education institutions in Turkey, of which 103 are public and 65 are private. 57 out of 103 public institutions are located at the periphery or the outside cities as separate campuses. Most of the new universities that are founded after 2000 have single campuses. In Izmir, there are four public and five private universities and Aegean University is one of the four public universities. Aegean University is selected as the case study to understand the physical and syntactical role of campus for the students' extra-curricular activities. Aegean University was established in 1955 with Middle East Technical University in Ankara and Atatürk University in Erzurum within the same political atmosphere of modernization facing United States of America for a model. The university gathers different faculties on the single campus area. Located just outside of Bornova district, it is with ten minutes walking distance to the center of one of Bornova's crowded neighborhoods.

Located in 345 hectare of open area, the campus was designed with the concept of an isolated enclave in the periphery of Izmir, has become a part of the district in years and has been

surrounded by new housing developments. With a student population of 34.010 in undergraduate programs and 53.000 in total, campus of the university is like a small town in terms of its population of eleven faculties/schools, eight institutes/graduate schools, school of music, and seven vocational schools and hospital working together with faculty of medicine. Besides educational facilities, there are cultural and social facilities in the campus: olympic swimming pool, stadium and cultural and convention center cultural activities mostly take place on Mötbe Culture and Convention Centre with the capacity for 700 spectators or Culture & Arts Hall for 330 spectators. There is also a campus market area with a shopping street.

In 2006, a private open air shopping center named Forum Bornova, and IKEA, having 45,000 m² of shops, restaurants, cinemas were constructed on the campus grounds. Another important development in the campus was the opening of a new metro station in 2012. Before these developments the entrances to the campus were through four gates that were controlled, but with the construction of the shopping center, IKEA and the metro station two more entrances are added to the campus that are not controlled and seem to make the campus more integrated with the city.

Aegean University campus has easily identifiable physical characteristics. One side of the campus is next to a motorway connecting Izmir to both northern Aegean cities and eventually to Istanbul, and to eastern Anatolia reaching Ankara. The campus is divided into east and west parts by a car road linking the centre of Bornova to one of the developing suburbs of Izmir. On the west part of the campus, there are three faculties, School of Medicine Faculty of Administrative Sciences and Computer Engineering, and the University Hospital. On the east part of the campus there are fifteen faculties (figure 1). In this part, car access to campus is controlled at two gates; one of the gates is located at the crossroad of Ankara, Istanbul and Izmir. Due to crowd coming and going to the hospital at the east part of the campus, the main entrance on this part has not been controlled.

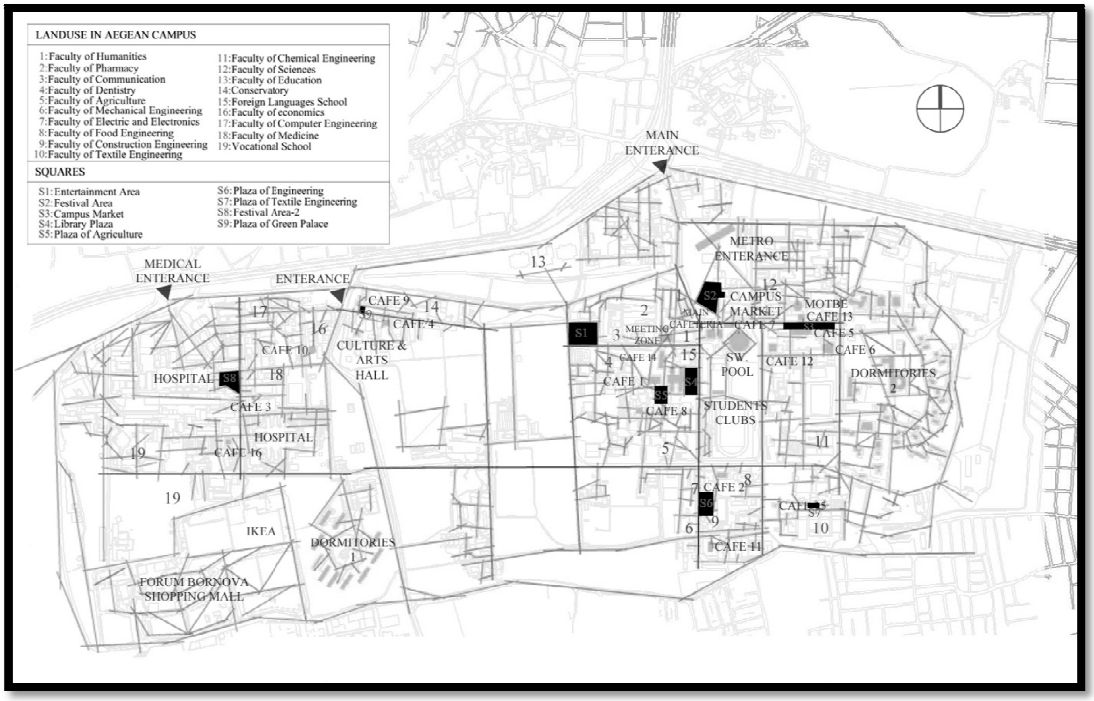


Figure 1 Map of Aegean campus showing faculties and squares.

An initial land use analysis reveals that major educational zones in the campus are arranged as self-sufficient settings and connected to each other by long pedestrian and car roads. There are various open spaces and most of them are green areas and groves, yet less is used for

spontaneous social activities. Open-air activities such as graduation ceremony take place at the amphitheater designed for use of 500 spectators, but concerts take place on the open area next to the metro station at the north part of the campus. Except the shopping street at the market area, there is no separate pedestrian walkway that is used as a promenade; pedestrians use the sidewalks parallel to the roads.

4. Methodology

This study aims to find out whether university campuses can function as public spaces for extra-curricular activities of students. The method in this study is based on short surveys conducted with students, space syntax analysis of the campus configuration, land use analysis presented in the previous section and observations on site. Space syntax analysis of the campus was done according to the method developed within the space syntax theory (Hillier, 1999). It is utilized to understand the spatial organization of the campus and the potential spaces for bringing students together. For the purpose of the study, both axial line analysis and segment analysis were constructed. The axial maps are drawn according to strategic lines. Both global (r-n) and local (r-3) level of analysis is applied. The segment model is then created based upon this axial map using the UCL software program Depthmap. Segment analysis has been recently proposed by Turner (Turner 2005). It decomposes axial lines into individual street segments and they are then analyzed according to the measurement of their topological depth with respect to all other segments. Hillier and Iida (2005) have recently shown that segment angular analysis can better represent movement patterns of people than axial analysis.

Also, in order to explore the stationary activity in the campus, a questionnaire survey was conducted to the students. The survey was designed to explore spatial preferences of students with three open-ended and six multiple-choice questions. The questions were related with 1. gender, 2. age, 3. The faculty they are affiliated with, 4. number of years in the campus, 5. where they live, 6. how they access the campus, 7. the public space they use the most in the campus, 8. their motivations behind the use of that public space and 9. frequencies of using that space.

Table 1 Faculties, their student population, and the number of students that answered our survey in Aegean University

Science	6617	32
Faculty of Literature	5508	25
Faculty of Engineering	5328	75
Faculty of Administrative Science	3853	39
Faculty of Communication	2735	3
Faculty of Agriculture	2469	31
Faculty of Medicine	2342	36
Faculty of Education	2170	3
Faculty of Fisheries	1134	18
Faculty of Dentistry	986	5
Faculty of Pharmacy	868	0
		38 (Conservatory)
		3 (blank)
Total	34010	307

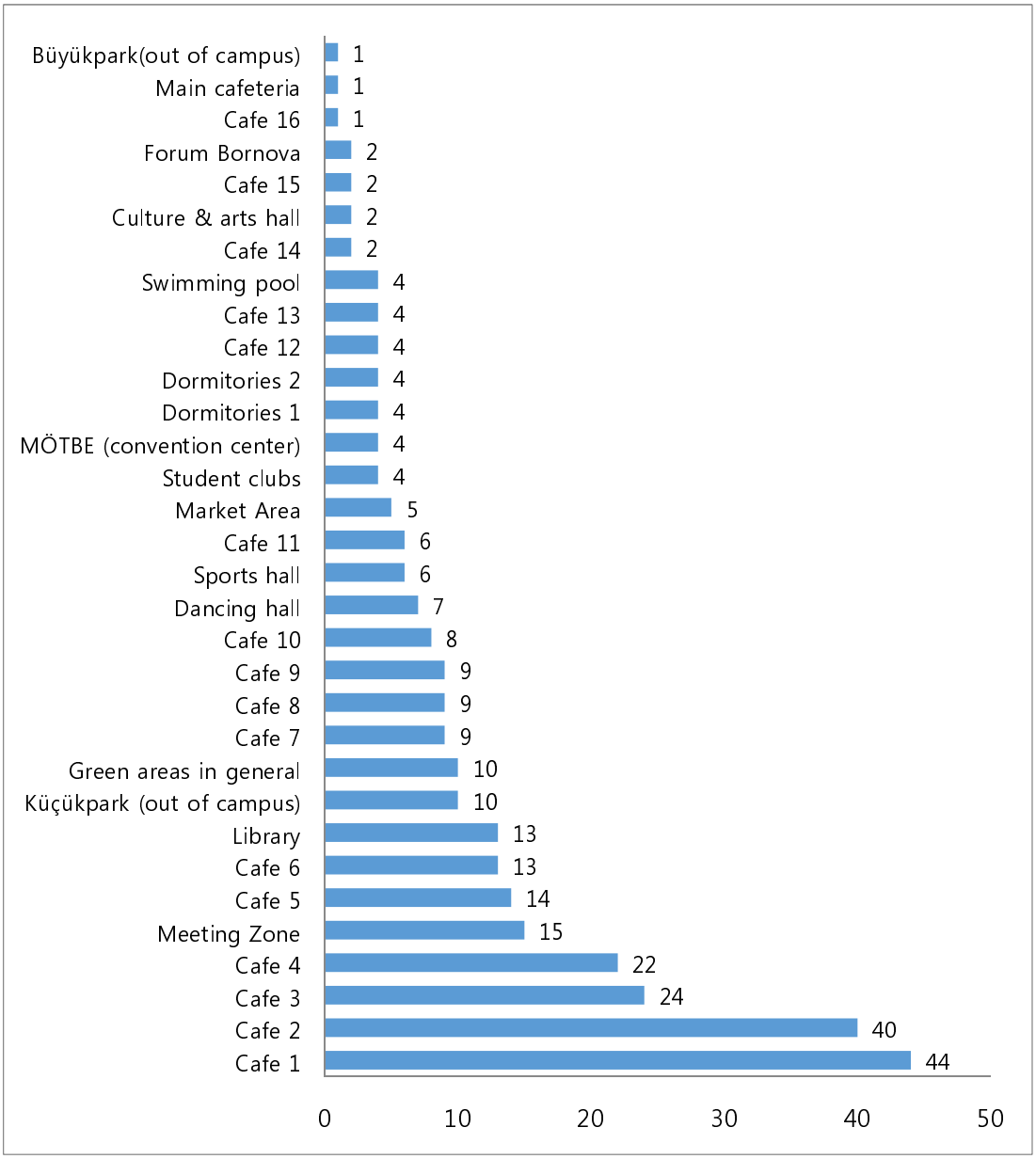
5. Findings

5. 1. Results of the Surveys

A total of 340 students on Aegean University campus were requested to attend the survey and questionnaires were distributed at open public spaces in the campus during lunch time. In total, 307 of the students participated in the survey, 26 of the responses were invalid and discarded from the analysis; the response rate was %83.

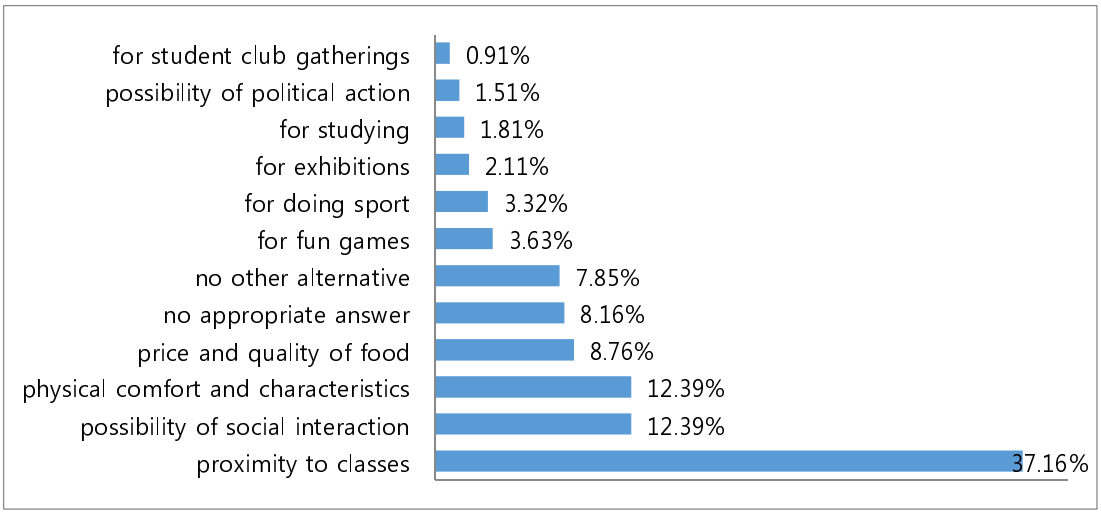
Respondents were 123 (44%) females and 159 (56%) males. The average age of the respondents was 22. Most of the students (89%) live outside the campus, and almost 57% of the students live in Bornova. 40% of the students walk to campus. The distribution of the faculty of students who attend the survey is presented in Table 1. Among the respondents, almost 26% are first year students, while 24% of them are second year students.

Table 2 Preferred public spaces by the students



As seen in the table 2, students named thirty-two public spaces in the campus and two outside the campus. Students mostly choose closed spaces, especially cafes, for social gatherings, which are close to their classes. Among the answers, two public places seem to be prominent. As seen in figure 1, most chosen space, cafe 1 is located at the intersection of four faculties. Similarly, cafe 2 serves for the three different departments of Engineering Faculty. Meeting zone in front of Faculty of Humanities is the fifth most preferred space. Survey and observations show that students chose this open space for the possibility of participation into political action are students prefer three other open areas out of the all 32 selected spaces in the survey for extra-curricular activities.

Table 3 Students' reasons of visits to public spaces in campus



Since the survey had open-ended questions students expressed more than one motive for using the space they stated in the survey. 331 answers are grouped into 12 categories. 'Proximity to their classes and work environment', was the most frequently mentioned reason by the students, accounting for the 37.1% of the answers. This result should not come with surprise: within dense academic calendar students prefer to go the nearest public space in their working environment. 'Physical comfort and characteristics' and 'possibility of social interaction' had equal amount of selection of the answers accounting for the 12.4 % and was the second reason for students to prefer specific public spaces in the campus. The expressions such as the presence of trees, and the physical quality of the space defined as 'comfortable', 'light', 'quiet' were also accounted as the dimension of nice physical environment. In these terms, physical quality of space becomes an important criterion for students to select specific public spaces. These two answers indicate that these spaces present sort of social and physical public environments, which are chosen deliberately by students. Moreover, 'price and quality of food' and 'no alternatives' followed in decreasing frequency mentioned by students. Also some student practices such as fun games, sport, exhibitions, studying, political actions and student club gatherings seems to another reasons of them to choose public spaces in the campus. Also, students are asked when they use these spaces; a highly percentage of students (76%) prefer to use them in weekdays, mostly between classes.

In the survey two coffee-shops, especially Kafe 1 and Kafe 2 are the most used spaces, which are located at the center of zones where many faculty buildings are located. According to the answers, %80 of the users is also affiliated with faculties that are close to these coffee-shops. In Kafe 3 and Kafe 4, are preferred by %100 of the respondents that are affiliated to faculties in close locations, there are no users from other parts of the campus. The fifth most preferred space, the meeting zone, in front of the school of humanities, however is selected by %73 of the respondents who attend to faculties far away from that zone. Students who select Kafe 5 attend

to the faculty of sciences, which is the closest educational building to the coffee-shop. There are no respondents from the other parts of the campus. Although Kafe 6 and Kafe 7 are not close to any faculty buildings, they are selected by diverse group of students. This may be due to the fact that Kafe 6 is close to the dormitories and Kafe 7 is close to the metro station.

There is difference in the choices of students who have been in the campus for two or less and the students who have been there for three and more years. Kafe 1, Kafe 4, Kafe 5, and Kafe 8 are mostly visited by first and second year students; kafe 2, Kafe 3, and Meeting zone is visited by students who have been in the campus for more years.

We understand that students prefer the spaces / coffee-shops that are closest to their classes (%37). This affirms the responses related with the faculty they attend. In other reasons, where social interaction is the main reason (%47) for students' choices is the meeting zone. This space is also preferred because it is acknowledged as an area of political practices such as student demonstrations and protests. %40 of the students who choose the meeting zone also state that political action is their main reason for using that space. Kafe 5 is being selected because of the possibility of social interaction as much as its closeness to the classes. The only type of space that is selected because of its physical/spatial qualities is the green spaces. It is the ninth most preferred space out of the 32 most visited spaces and the second open space in the list.

5. 2. Space Syntax Analysis

The Whole Campus

We found that for the axial analysis global integration value of campus is 1.34, and the local integration value is 1.84. Global integration analysis (r-n) shows that the most integrated lines (axis 1 and 2) are same with the previous analysis showing the global values of campus on the west part (figure 2). However, the third integrated axis becomes the route separating the zone of Dormitories 2 and IKEA from the Hospital and Faculty of Medicine part. Except this axis, it is seen that there is no integrated axis emergent in the east part of campus. Also, the axis dividing main campus from the hospital section and open areas are added to the integrated axis.

In the local scale, three long integrated axes in the hospital part are added to the integrated axes. One is the axis starting from the Computer Engineering building and ending on the north part of IKEA. Our observations show that this route is highly used by the students and other users who go to the shopping mall and Ikea from the city. Also, the festive area in the hospital section is directly connected and two popular cafes (Cafe 16 and cafe 3) which are chosen in the surveys and are one step away from this axis. The second integrated axis goes along the buildings of the hospital and divides the campus from the city on the west part. Two more short axes connecting different buildings of faculties are integrated on the hospital section. One axis starts from the Department of Computer Engineering and ends with the pedestrian entrance which is coming from main part of campus. The other one connects Faculty of Medicine to the Hospital buildings.

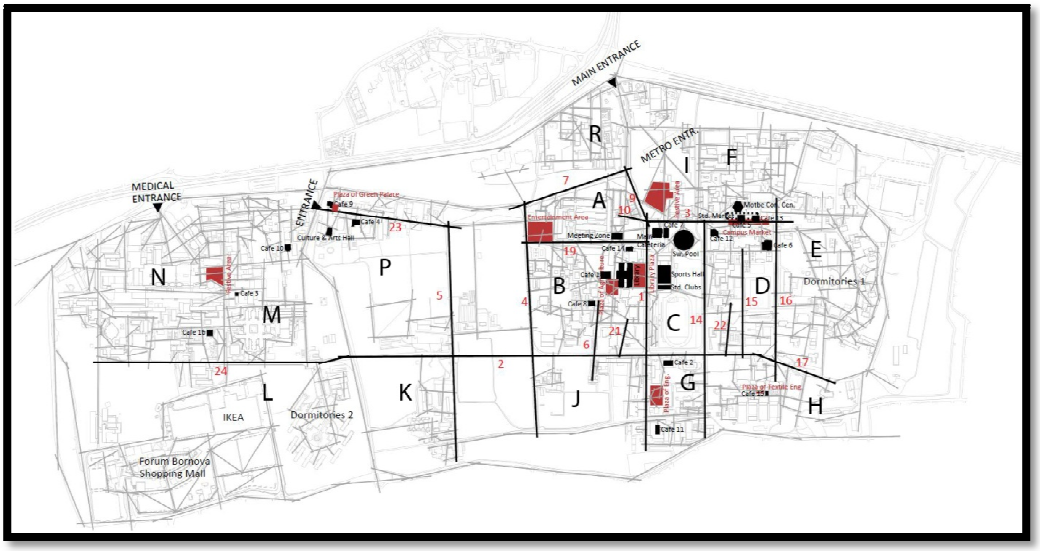


Figure 2 The Map of whole campus shows the squares, most chosen public spaces and the most integrated axes (%15 of the all axes).

The East Part of the Campus

In this section, spatial configuration of the campus through the analysis of axial maps is investigated in order to examine the integration and accessibility between parts of the campus. We found that the global integration value of campus is 1.21, and the local integration value is 1.83. Global integration analysis (r-n) shows that the area containing most integrated line follows the public transportation route (figure 3). The most integrated line (2.21) is not a crowded pedestrian road used by students. Rather, it is the route of public transportation and it is surrounded by the vast open areas. The areas cultivated by the Faculty of Agriculture are located on the west part and four departments of Engineering and Stadium are located at the two side of the road on the east part. The second integrated line (2.03) is connected to the most integrated line and goes along the public facilities including main cafeteria, library, sports hall and stadium. The observations show that the third integrated zone (1.98) is the crowded pedestrian alley which is closed to car traffic. It goes along the main cafeteria; swimming pool and ends with Campus Market, including diverse cafeterias, banks, and shops.

Except the four departments of Engineering (Chemistry, Food, Agriculture and Electrical Engineering), none of the faculty buildings is located on the most integrated axis. As seen from the figure 1, there is a hierarchical separation defining introverted zones which are, in turn, connected to the main integrated lines. The observations show that since the different parts of faculties are connected at these introverted zones; the students spend their time mostly in these introverted zones between classes. However, the axes in the zones are not globally integrated.

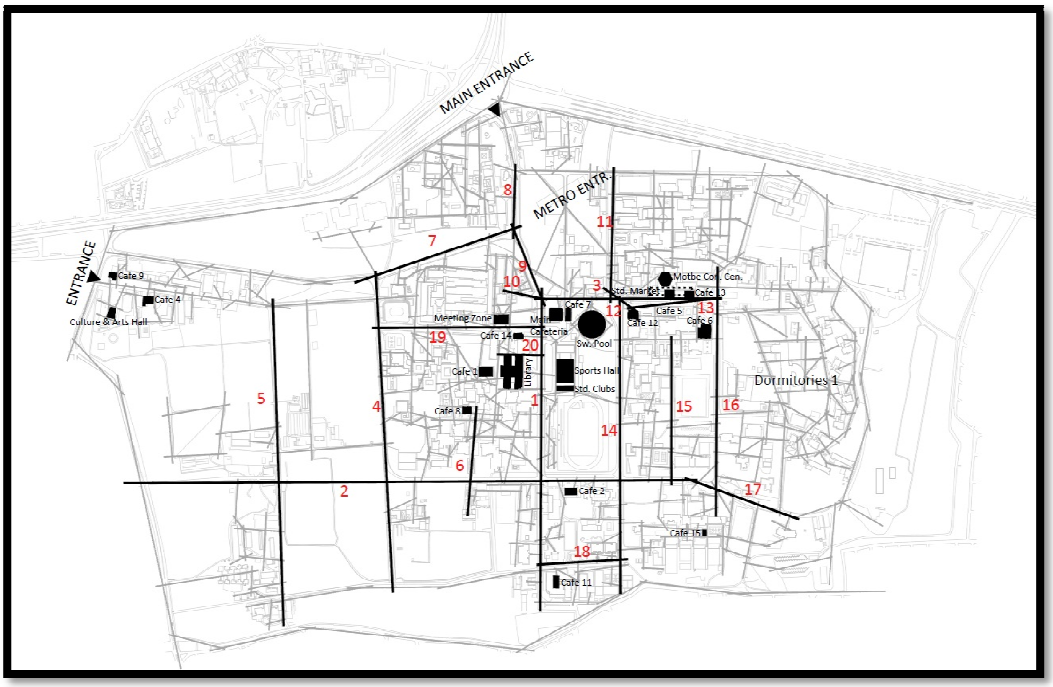


Figure 3 The Map of east part of the campus shows the squares, most chosen public spaces and the most integrated axes (%15 of the all axes).

As seen in the figure 1 some of potential open areas are located on the integrated zones. For example, the Engineering plaza and Library plaza are directly connected to the second integrated axis; festive area near to metro entrance and market alley are connected to the third integrated axis. However, plazas of Textile and Plaza of Agriculture are located in the introverted zones and seems segregated from the integrated axes.

The local integration pattern shows that almost all the integrated lines in Rn analysis are also integrated in R3 scale except the axes connecting the zone of Department of Agriculture and the axis connecting the abandoned zones to the second integrated axis. However, the axes connecting the Academy of Music to the entertainment zone is connected to the integrated axes. As expected, locally integrated axis inside the zones have passed through them. This supports the planning principle based on the hierarchy of zoning that moves from inside the zones consisting the complexes of departments toward the linear zones in between schools and ends with the axis connecting zones of schools.

Table 4 The values of most integrated axes

Axe #	RN	R3	Connectivity		Axe #	RN	R3	Connectivity
1	2,37	3,68	18		1	2,19	3,69	19
2	2,33	3,71	28		2	1,99	3,71	28
3	2,27	3,61	19		3	1,81	3,61	19
4	2,1	3,18	16		4	1,91	3,19	16
5	1,89	3,08	13		5	1,84	3,11	13
6	1,78	2,69	6		6	1,69	2,71	6
7	1,96	2,81	9		7	1,71	2,82	9
8	1,84	2,67	6		9	1,76	3,14	7
9	2,13	3,14	7		10	1,68	3	6
10	1,98	3	6		14	1,87	3,26	17
11	1,85	2,95	13		15	1,72	2,71	9
12	1,92	2,84	5		16	1,72	3,22	18
13	1,79	2,71	5		17	1,86	3	9
14	2,1	3,25	17		19	1,67	3,25	12
15	1,82	2,69	9		21	1,69	2,64	6
16	2,07	3,22	18		22	1,67	2,52	5
17	2,07	2,99	9		23	1,73	3,15	18
18	1,78	2,86	5					
19	1,9	3,25	12					
20	1,76	2,8	5					
WHOLE CAMPUS					**EAST PART OF THE CAMPUS**			

When analyzed the segment maps of the campus for the radius 400 m, they show some differences from the axial analysis. In the segment analysis of whole campus, in addition to main route passing along library, some short lines inside the enclaves seem as integrated lines. These short lines connect the most chosen public spaces (café 1, café 8, café 14) and in some way define a potential public area for gatherings between the faculties. Especially the analysis of the whole map, there is an integrated line connecting faculties to the hospital area compared to the axial analysis. The same lines in the East part of the campus seem as integrated. When analyzed the integrated lines in segment R400 maps and the results of the questionnaire, the integrated lines define the potential streets connecting the most chosen public spaces in the campus.

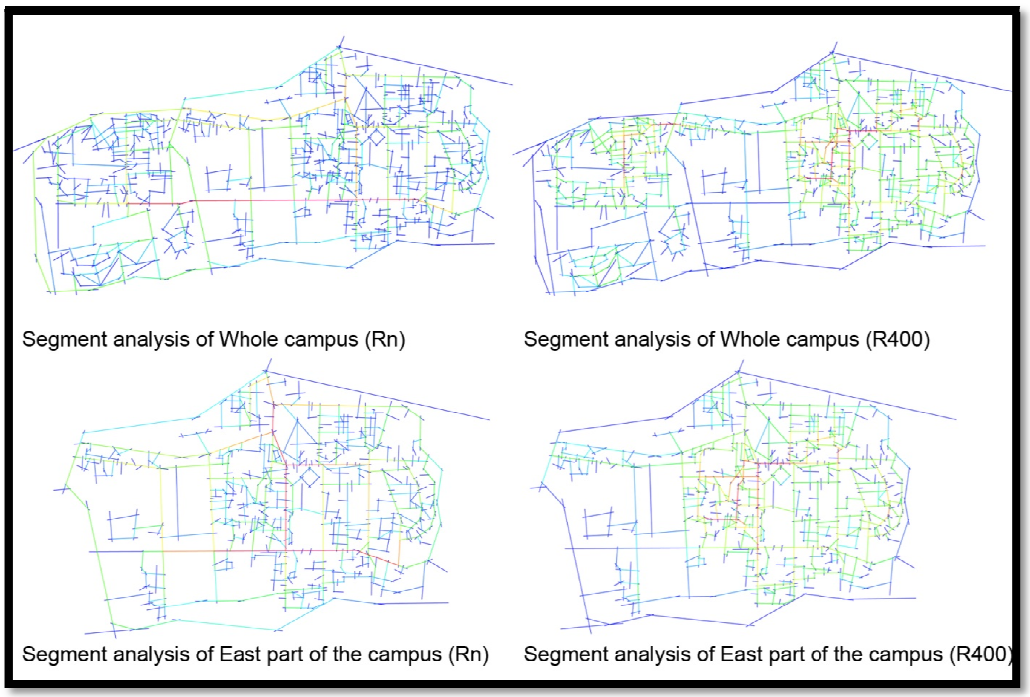


Figure 4 Segment maps of the campus

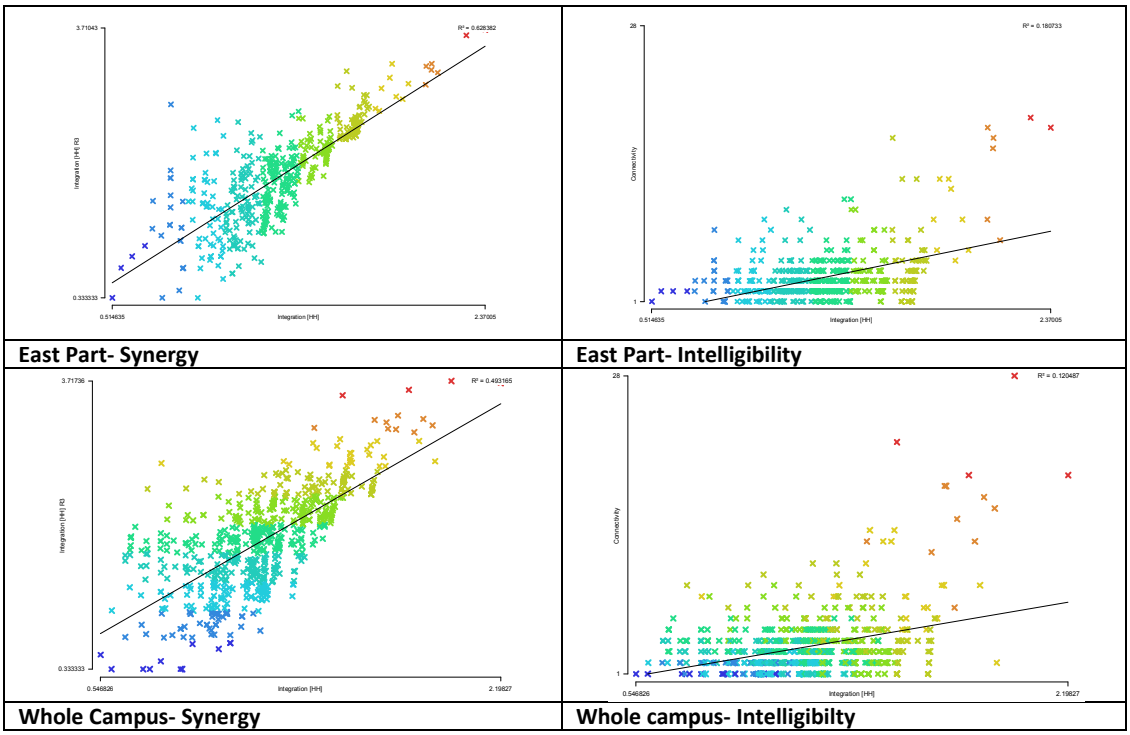


Figure 5 The graphics of synergy and intelligibility (the above ones are belonged to the east part, while the below ones are belonged to the whole campus)

According to studies in syntactic analysis, the synergy and intelligibility of campus can be seen two significant factors which have implications for students' movement to a varying degree. In our example, there is a good relation between local and global integration (synergy) in whole campus model. That means a clear relation between local and global structure. However, a correlation analysis of connectivity and integration shows that both the whole campus and the east part of the campus also have low intelligible structures (r2 = 0.12 and r2= 0.18 respectively; figure 4). It is related directly with "understandability" of the campus spatial layout. The more related integration and connectivity values of aces, the more likely it is that the user will be able to understand the spatial layout of the campus.

Table 5 The values of axes in the enclaves

Enclave	# of axes	Axes inside of enclaves		Axes surrounding the enclaves		Difference between avarage integrations		Faculty #	# of chosen spaces
		RN	R3	RN	R3	Rn	R3		
A	26	1,32	1,99	1,7	2,99	0,38	1	3	1
B	68	1,42	2,06	2,02	3,4	0,6	1,34	3	3
C	21	1,48	1,91	2,25	2,9	0,77	0,99	0	2
D	26	1,52	1,94	2,2	3,3	0,68	1,36	1	2
E	56	1,17	1,79	1,45	1,91	0,28	0,12	0	0
F	51	1,2	1,79	1,6	2,5	0,4	0,71	1	4
G	27	1,45	1,87	1,87	2,88	0,4	0,99	3	2
H	30	1,27	1,57	1,32	1,88	0,05	0,31	1	1
I	14	1,33	2,07	1,61	3,1	0,28	1,03	0	0
J	17	1,38	1,86	1,79	2,92	0,41	1,06	0	0
K	16	1,33	1,64	1,43	2,23	0,1	0,59	0	0
L	16	1,09	1,33	1,26	2	0,17	0,67	0	0
M	33	1,17	1,84	1,54	2,79	0,37	0,95	2	1
N	21	1,18	1,95	1,53	3,11	0,35	1,16	2	1
O	62	1,18	1,96	1,47	2,77	0,29	0,81	1	1
P	20	1,26	1,64	1,67	2,83	0,41	1,19	1	2
R	26	0,96	1,68	1,53	2,38	0,57	0,7	0	0

6. Conclusions: Juxtaposing Land Use, Survey Results, and Space Syntax Analysis

The overall layout of the university campus shows differences from the city segments: Through adjacent to one of the city center and to an urban area on the east, spatially the campus can be considered almost disconnected from its surroundings with its definite physical boundaries. In other terms, the campus is substantially more segregated than the rest of the urban surface and has special enclaves which form discontinuities in the urban grid (Hillier, 1996, p.134).

The integrated axis in the whole campus (figure 2) is longest lines and they form a somewhat gridal structure in the campus movement system. The most segregated axes are all spread around the periphery of the east and part of the campus. The integrated axes define introverted enclaves having segregated axes inside. There is no transition between segregated and integrated axes which locate in enclaves (figure 2) as seen in table 5. There are many short and segregated axes inside the enclaves that are connected to the long and integrated axes which are the main integrated lines in the whole campus and form the periphery of the enclaves. When there are four axes constituting the peripheries, the number of axis inside the enclaves differs from 14 to 68. The difference between the average local integrations of the inside and outside enclaves is high: among 17 enclaves, the difference is approximately 1,00. Interestingly the differences between global average integrations are not as high as the local ones: only 4 out of 17 values are above 0, 50. This creates different zones of faculties which look like “inward facing unconstituted and hierarchical zones” within spatial layout of campus.

Located inside these enclaves, coffee shops are the social hubs for students. Other public buildings such as MÖTBE, Culture and Arts Hall and open public spaces such as two festive areas, entertainment area and meeting zone are not effective in bringing people together spontaneously. On the other hand, except two spaces (Culture and Arts Hall and Festive Area in the east part), all other spaces are either by the most integrated lines or two steps away from these axes.

Aegean University as an example of an isolated self-sufficient campus model is a case to the point. For enhancing the spatial functioning of the campus life we can suggest Line 1 and Line 2 in figure 2 and figure 3, as good candidates for attracting more public spaces connecting students from the two parts of the campus.

In general, introverted enclaves supported by local hubs (coffee-shops) may be suitable for a campus structure when students’ busy and concentrated lives are considered. Nevertheless, as we argue a university campus is not only working or educational environment. Higher education needs, perhaps as much and as varied as cities, a virtual community and collective spaces that supports it. In that sense, public spaces that are intended to work at the global level should be on the most integrated axis.

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