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SCHOOL ARCHITECTURE AND ITS EFFECT ON LEARNING OUTCOME:
A REVIEW OF HIGHER EDUCATION DIMENSION

MASTER THESIS

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School Architecture and Its Effect on Learning Outcome:
A Review of Higher Education Dimension

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(Master's Thesis)

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Declaration

I hereby declare that the Master's Thesis, **"School Architecture and Its Effect on Learning Outcome: A Higher Education Dimension"**, which I wrote myself, has been prepared in accordance with ethical and scientific values and that all the sources that I have used in this study are included in the references.

23/08/2019

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School Architecture and Its Effect on Learning Outcome: A Review of Higher

Education Dimension

Neslihan SAÇAN

Abstract

In most classrooms, schools, and even in campuses intended learning experiences may not be positive, but instead negative due to lack of complete understanding of the importance of connection between learning and environment. Positive learning experiences may directly be related to conditions of facilities and, in particular, student achievement depends on effective utilization of learning environment. In order for buildings to meet the needs of different learners from different age, gender, climate, geography and many more characteristics of both learner and environment, comprehension of necessary design patterns become inevitable for both educators and architects. From a constructional and architectural perspective, those design patterns may be considered as structural, but from an educational perspective design concepts involve creating effective learning environment that considers flexibility, decorations, stimulating educational materials, sunlight, noise, heat, ventilation, acoustics, colour and so forth as essential to learning. These would be considered as overall functionalities that have impacts on learners' success, motivation, and academic performances.

The main purposes of this study are exploring the interaction among architectural features of campus and students' experiences with these in relation to their learning, explaining the linkages among particular parts of a campus structures that are relevant to students' learning experiences, and providing suggestions about merging aspects of physical environment and contemporary learning practices for current and future applications. Both qualitative and quantitative methods were employed in order to gather comprehensive data. A qualitative method part includes observations, site visits, interviews, document analysis, questionnaires,

expert opinions as well as opinionnaires, and other source of data gathering instruments employed to gain an in-depth understanding to explore than to explain the interactional features of learning environment and learning.

Participants of this study were students and instructors from Çanakkale Onsekiz Mart University. The study has three groups of participants including 161 university students from different years for the questionnaire part, 25 students and 5 academicians for gathering qualitative information. "Questionnaire for Determining the Relationship between Learning and Learning Environments" was developed and used in this study.

Results indicated that the buildings, covered areas and, open spaces of a campus need to be organized to utilize out of school learning. Based on the results, it can be concluded that before constructing an educational buildings, there is a great need for mutual collaboration between architects and educators.

Keywords: School architecture, learning, campus environment, educational structures.

Okul Mimarisi ve Okul Mimarisinin Öğrenme Çıktılarına Olan Etkisi: Üniversite Boyutu

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Özet

Çoğu sınıflar, okullar ve hatta kampüslerde öğrenim amaçlı deneyimler olumlu olmak yerine öğrenme ile çevre arasındaki bağlantının önemini tam olarak anlamadığımız için olumsuz olabilir. Olumlu öğrenme deneyimleri doğrudan imkanların koşullarıyla ilgili olabilir ve özellikle öğrencinin başarısı, öğrenme ortamının etkin kullanılmasına bağlıdır. Uyarıcı öğrenme ortamları işlevi gören eğitim ortamları oluşturmak önemlidir. Binaların farklı yaş, cinsiyet, iklim, coğrafya gibi hem öğrenen hem de çevrenin birçok özelliğinin ihtiyaçlarını karşılaması için, hem eğitimciler hem de mimarlar için gerekli tasarım örneklerinin anlaşılması kaçınılmaz hale gelmiştir. Yapısal ve mimari açıdan bakıldığında, bu tasarım kalıpları yapısal olarak düşünülebilir, ancak eğitim açısından tasarım anlayışı; esneklik, dekorasyonlar, uyarıcı eğitim materyalleri, güneş ışığı, gürültü, ısı, havalandırma, akustik, renk gibi dikkate alan etkili bir öğrenme ortamı yaratmayı içerir ve bunlar öğrenmenin temelini oluşturur. Bunlar, öğrencilerin başarısı, motivasyonu ve akademik performansları üzerinde etkisi olan genel işlevler olarak kabul edilir.

Bu çalışmanın temel amacı, yerleşkenin mimari özellikleri ile öğrencilerin deneyimleri arasındaki etkileşimi araştırmak, öğrencilerin öğrenme deneyimleriyle ilgili kampüs yapılarının belirli bölümleri arasındaki bağlantıları açıklamak ve bu konuda önerilerde bulunmak, mevcut ve gelecekteki uygulamalar için fiziksel çevre ve çağdaş öğrenme uygulamalarının birleştirilmesidir. Kapsamlı veri toplamak için hem nitel hem de nicel yöntemler kullanılmıştır. Nitel bir yöntem gözlemleri, saha ziyaretlerini, röportajları, doküman analizini, anketleri, uzman görüşleri yanı sıra fikir alanlarını ve öğrenme ortamının

etkileşimli özelliklerini açıklamaktansa daha derinlemesine bir anlayış kazanmak için kullanılan diğer veri toplama araçlarını içerir.

Bu araştırmanın katılımcıları Çanakkale Onsekiz Mart Üniversitesi'nden öğrenciler ve öğretmenleridir. Çalışmada, ankete farklı yıllardan 161 üniversite öğrencisi, nitel bilgi toplamak için 25 öğrenci ve 5 akademisyeni içeren üç katılımcı grubu katılmıştır. Bu çalışmada "Öğrenme ve Öğrenme Ortamları Arasındaki İlişkinin Belirlenmesi İçin Anket" geliştirilmiştir ve kullanılmıştır.

Sonuçlar, binaların, kapsanan alanların, ve okul dışı öğrenmeden yararlanmak için kampüsün açık alanlarının düzenlenmesi gerektini göstermektedir. Sonuçlara dayanarak, bir eğitim binası inşa etmeden önce, mimarlar ve eğitimciler arasında karşılıklı işbirliğine büyük ihtiyaç olduğu sonucuna varılabilir.

Anahtar Kelimeler: Okul mimarisi, öğrenme, kampüs ortamı, eğitim binaları.

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Inclusive School Building Assessment Checklist

Chapter One: Introduction

In most classrooms schools, and even in campuses intended learning experiences may not be positive, but instead negative due to lack of complete understanding of the importance of connection between learning and environment. Studies show that appropriateness of school design and building structure create an important impact for learning as well as teaching. Positive school experiences may directly be related to conditions of facilities and, in particular, student achievement depends on effective utilization of learning environment. Not only architects but also educational scientists need to consider the effectiveness of architectural dimensions in relation to learning environment. Even though numerous studies consider these issues as important aspects of schooling, only a few studies in educational sciences field focus these phenomena.

It is important to establish educational settings that serve as stimulating learning places. In order for buildings to meet the needs of different learners from different age, gender, climate, geography and many more characteristics of both learner and environment, comprehension of necessary design patterns become inevitable for both educators and architects. From a constructional and architectural perspective, those design patterns may be considered as structural, but from an educational perspective design concepts involve in creating effective learning environment that considers flexibility, decorations, stimulating educational materials, sunlight, noise, heat, ventilation, acoustics, colour and so forth as essential to learning. These would be considered as overall functionalities that have impacts on learners' success, motivation, and academic performances.

Recent studies conclusively express the importance of school architecture and indicate schools as important places where students and teachers spend most of their daily time. That is to say, there is a transactional relationship between school architecture and learning outcomes. However, Duke (1998) asserts it may be difficult to determine the precise impact

that the physical characteristics of schools directly influence learning outcomes, but may create an indirect effect (cited in Tanner, 2008)

Historically, in today's city life residential areas became densely populated and greater attention centred on establishing the suitable infrastructure for a growing society. Therefore, parallel with this density, educational buildings started to capture attention as a-brand-new project for educational reformers (Barnard, 1842, as cited in Weisser, 2006).

In relation with aforementioned information, universities were influenced by this societal change. Single-school-building approach turned out be as campus-based educational institutions due to growing population and improvement in human life. Hence, a multiple buildings or congregation of several buildings under one single institution has changed the conceptual understanding of learning environment. Campus-based universities gained popularity in the last century. Today, almost all undergraduate and postgraduate education is held in university campuses. Thus, the infra-structure of these higher education institutions and the effect of campuses on student learning should become an area of concern for educators.

Background of the Problem

Recent studies focus on the interaction between school architecture and its effect on learning outcomes. If school architecture and the physical environment is significantly considered and responsive to the teacher and student needs, the new learning environment will enhance the learning process. For instance, the physical features of the school building can be considered important for improving the quality of education.

Therefore, this study investigated university building design, some stimulating features of the school architecture and indoor and outdoor environmental features that could possibly influence student outcomes such as: shape and texture, size of the classes, corridors as well as stairs, place for individual and group learning, color,heating system, lighting, air,

noise-proof walls, environment that provides social interaction like cafeteria and lounges; and in addition to these, some common areas such as conference and meeting rooms, green areas, library and reading rooms have an effect on learning outcomes. As stated in the literature, Lyons (2002) asserted that the teaching resources, the quality of the teacher and the educational program are important in the education of the child, and in addition to these factors, the physical conditions of the school structure are also influential on learning and student achievement (cited in Mcgowen, 2007, p.95). Also, according to Özerbaş (2011) creative learning can be provided as long as the learning environment is psychologically healthy, free, safe and away from the stress and pressure. Thus, to create a dedication to achieve and encourage students' movement, the primary learning settings should be provided, and the school architecture should allow all these happenings. It may be difficult to determine precisely the impact of results directly as Duke (1998) states that the physical characteristics of schools do not directly influence the results of the examinations, grades, but have an indirect effect on learning.

However, Jeff Lackney (1994) reported in his research-based design principles that stimulating environment, places for group learning, linking outdoor and indoor places, public space, safety, spatial variety, changing displays, resource availability, flexibility, active and passive places, personalized space and the community as a learning environment are all fundamental issues for developing a school architecture process (cited in Sanoff, 2001)

As a result, a review of the literature conclusively demonstrated that schools are the important places where students and teachers spend most of their time and it expresses the importance of school architecture. However, how and what ways do physical texture of a campus construct an effect on learning experiences at a higher education level is somewhat rare or left unstudied.

Purpose of the Study and Research Questions

This study has three main purposes:

1. To explore the interaction among architectural features of campus and students' experiences with these in relation to their learning.

2. To explain the linkages among particular parts of a campus structures that are relevant to students' learning experiences.

3. To provide suggestions about merging aspects of physical environment and contemporary learning practices for current and future applications.

And one major question guided this study:

In what ways do physical texture of a campus construct an effect on learning experiences at a higher education level?

Following sub-questions elaborate this one major question:

Sub Questions:

1. What are some major characteristics of effective learning environments from an architectural perspective?

2. How physical environment of a campus should accommodate the needs of learners?

3. In what ways could campus milieu be transformed into a learning or learner-friendly organization?

Significance of the Study

Based on the above this study mainly expects to:

a) Investigate learning environments in accordance with the needs of university students.

b) Describe the best and current possible internal and external conditions for learning.

c) Critique educational expectations from an architecture.

d) Explain the essential features of architecture and its relationship about learning environment.

e) Suggest an amelioration towards effective educational structures for the future.

f) Provide suggestions for an attractive and stimulating architectural quality.

g) Help to interrogate a technology-rich environment and campus quality.

Delimitations of the Study

Participants of this study was delimited to students and instructors from Çanakkale Onsekiz Mart University. The study was delimited to three groups of participants including: 161 university students from different years for the questionnaire part, 25 students and 5 academicians for gathering qualitative information. Since this study is delimited to above participants and uniqueness of each campus environment, the results would not be generalizable to different universities.

Limitations of the Study

This study was limited by the following factors:

1. Only identified 2018-2019 students in Çanakkale Onsekiz Mart University located in Çanakkale were selected to participate in this research study.

2. Sample population were located only in Çanakkale city.

3. This study may not be generalizable to other university campuses and buildings that differ in scale of building, texture, structural shape, school size, aesthetic, rooms and doors, entrances, color of the campus and campus buildings, location of the school.

4. "Questionnaire for Determining the Relationship between Learning and Learning Environments" was developed and it was the only measure of determining the effect of school architecture on learning outcomes used in this study.

Assumptions

The following assumptions were made for the purposes of this study:

1. An underlying assumption for this study was that the design patterns of the school's physical environment and school architecture influence student achievement

2. Students interviewed during the site visits responded to all questions honestly and objectively.

3. Students understood and answered the questions accurately.

Definitions of Terms

1. Çanakkale Onsekiz Mart University: Higher education institution consisting of the first, second, third and fourth year students, located in Marmara Region with nearly 50.000 students. Please see https://www.comu.edu.tr/ for detailed information. Terms efficiently defined by Yarbrough, K. A. (2001)

2. Learning Environment: Physical location where teachers have an interaction with students and organize an educational setting to learning.

3. University students: University student who practices and learns the theoretical knowledge.

4. Overall building condition: This refers to how well the building has been maintained.

5. Scale of Building: This refers to the height and size of different aspects of the building, including windows, water fountains, door handles, etc.

6. Aesthetic environment: This is the colour scheme and patterns of the building.

7. Visual environment: This is the number of windows and the degree of lighting in the building.

8. Acoustical environment: This refers to how sound travels through the building, and it based upon noise level.

9. Thermal environment: This refers to the climate controls in the school building.

10. Outdoor environment: This consists of all areas outside of the school building that are located on the school's property.

11. Personal space: This is the amount of space needed by students to feel comfortable and safe.

12. Green areas. Outside spaces that include trees, gardens etc. (p. 9).

Review of Literature

A review of the literature was undertaken for the purpose of determining what information was previously documented related to main aim regarding the ways that whether physical structures of a campus construct has any effect on learning experiences at a higher education level. Since this investigation focused on campus architecture and its effect on learning, the review of the literature was examined in relation to following major and sub questions:

In what ways do physical texture of a campus construct an effect on learning experiences at a higher education level?

Sub Questions:

1. What are some major characteristics of effective learning environments from an architectural perspective?
2. How physical environment of a campus should accommodate the needs of learners?
3. In what ways could campus milieu be transformed into a learning or learner-friendly organization?

Based on the aforementioned questions, review of literature is presented under three main dimensions. With regard to the impact of the educational settings, students and academicians' performance have been searched but the architectural dimension has long been neglected in relation to learning environment since they spend more than 90% of their time indoors (Höppe, 2002). In addition, demand from educational buildings where the transfer or construction of knowledge occurs, may vary in accordance with the expectations of the individuals, their interests, needs, requests, social and economic development level of the society, the technological characteristics of the era, the type of the information transferred, and the use of information as well. Moreover, as (Sanoff, 2001) underlines the fact that

students should not be ambivalent participants instead their voice --in running their schools-- must be heard since schools provide personal and academic development through creating opportunities to improve the learning environment, such as building outdoor recreation, and nature areas.

Effective learning environment and an architectural perspective. Major characteristics of effective learning environment would be categorized under two main types: Effective environment related with learning and effective learning environment related with architecture.

Effective environment and Learning. Learning environment should not be considered just a place where students achieve curriculum goals. It is far beyond the rows of desk and chalkboard. Environment cannot be limited to its influential characteristics where students develop attitudes and demonstrate behaviors in accordance with what environment allows them. In other words, environment may determine pupils' behaviors through its existent structural standing. Creating an effective learning environment requires a tremendous effort - as literature frequently insist- in order to gain benefits from numerous other important fields to maintain a reciprocity in different field of expertise such as pedagogy, sociology, educational philosophy, psychology, ergonomics, architecture and design, indoor and furniture design, landscaping, curriculum and learning theory, and so forth. Learning environment is one of many inevitably important factors that merge teaching and learning practices as it produces conditions that improve students physically, cognitively, motivationally, behaviorally as well as emotionally (Oblinger & Lippincott, 2006). McGregor (2004) states these conditions as architectural, social, cultural, historical, and natural. Moreover, real and virtual environments can be considered as important since learning has a swift shift toward digitalization.

In order for successful learning experience and enhance students' learning, an environment where learning happens should be desirable, useful, and effective. Similarly, among many aspects, Oblinger (2005) states following as any learning environment should comprise:

- supportive to multiple types of learning activities

- enabling connections inside and outside

- accommodating information technology

- comfort, safety and functionality

- reflect institutional values (cited in Blackmore, Bateman, O'Mara, & Loughlin, 2011, p.6)

The main issue is the one that learning needs to be sound with environment, consistent with meeting the demands of different epistemology, and proficient to the needs, flexible and movable, and educationally and physically appropriate (Butin, 2000). Furthermore, campus environments must have the purpose of supporting learning opportunities that enhances the learning process. Creating an effective environment that promotes learning, all necessary substances which nourish learning, buildings (interior and exterior), classrooms, social and individual areas, technology transfer; safety, health and welfare facilities needs to be taken into consideration. Oliver & Swan (1989) propose that in order to increase belonging, well-being and satisfaction students' personal and social demands needed to be taken as primary concerns. Among many variables, intrinsic and extrinsic motivation may create a significant impact on educational achievement. OECD meetings in 2005-06 on "Evaluating Quality in Educational Facilities" defines educational spaces as:

All individuals have a right to a quality educational facility, a physical space that supports multiple and diverse teaching and learning programmes and pedagogies, including current technologies; one that demonstrates optimal, cost-effective building

performance and operation over time; one that respects and is in harmony with the environment; and one that encourages social participation, providing a healthy, comfortable, safe, secure and stimulating setting for its occupants. (s.1)

In addition to aforementioned, design of a developmentally appropriate physical environment can be considered as an important dimension as they allow for real experiences in different areas or levels of schooling. Nevertheless, instead of focusing on an expected learning environment, insisting on struggling in poor conditions may result in negative outcomes on both students and teachers (Filardo, 2008; Fisher, 2004). Designing and maintaining schools poorly, would end up with minimal educational achievement. In fact, this also have an unintended impact on educators and learners' morale and engagement, and create negative impact on student behavioral outcomes (Filardo, 2008; Fisher, 2004).

Effective learning environment related with architecture. Literature generally mentions the quality of conditions and its effect on educational applications. Much of this talk centers about how space is used with what effect. Architecture not only concentrates on physical standing of a building but must consider the educational needs. Clearly, its focus should consistent with the educational demands and have pure connection with learning spaces and student outcomes. Especially pertinent theme here is the significance of the design approach (Patrix, 2017). General trend about designing learning spaces put much effort on architects and/or interior designers and traditionally teacher-practitioners --most of the time-- are ambivalent that means educators' scientific imagines are left unmentioned, but architectural expertise stepped forward in designing learning spaces (Jamieson, Fisher, Gilding, Taylor, & Trevitt, 2000).

Campus life is very important for both personal and academic development of students. Campus as learning environment should provide and be beneficial for students' development of total confidence, a sense of communal identity, creating awareness of social

life, and finally develop motivation for learning. Furthermore, in addition to learning dimension of a campus arrangement, environmental factors have extra characteristics that provide learners to develop their perceptions, imaginations, developing intra and interpersonal skills.

Another important learning environment is classroom. (Greene, Miller, Crowson, Duke, & Akey, 2004) noted that perceiving classroom structures in developing motivation for better learning has close relationship with the shape of those education buildings. Sanoff (2001) justifies the classroom as quality issue and education in those classrooms is necessarily determined by the quality of setting and classroom actions of students and teachers. Classrooms should not be assumed as a standalone cement structure; it needs to be carefully questioned and transformed toward social involvement.

The main goal in developing efficient classroom practices to understand how the environment supports students' learning activities and how environment nurtures their academic and social development should not only be educators' concern but other participants such as architects and policy-decision makers may involve in this development process. It is an inevitable fact that changes in teaching and learning will only occur as a result of creating effective learning spaces and employing learner friendly design approaches. However, it is an unfortunate issue that there is a limited empirical evidence provided by the literature which supports the reciprocity in connecting the design process to learning outcomes (Blackmore, Bateman, O'Mara, et al., 2011)

Another essential dimension to be considered is, as Gislason (2009) explicates, collaborative attempts among multidisciplinary teaching practices and designing effective learning environment would end with proper development of 'social capital.' The Rudd, Reed, & Smith (2008) study seems similar to the idea set by Gislason (2009) that student

show greater involvement toward learning in newer environments that carries out the characteristics of well-designed school buildings.

Although there different opinions exist in relation to well-design school buildings based on the ideas set by different individuals such as size, esthetic features, location, interior design, constructional materials, and so forth, the dominant trend in today's educational practices is establishing schools that are smaller, manageable, and controllable. Nevertheless, as Gislason (2009) asserts the term 'social capital,' most schools may feel obligated in merging the idea of "schools within schools" in order to promote communities of learners. Darling-Hammond, Ancess, & Ort (2002) mention controversial points of architectural perspective in relation to learner, learning, and teaching performance. The contra version is about the type of school and the relationship to performance. They assert that small schools with less bureaucracy, but greater autonomy helps students and teachers exhibit better performance. In order to gain more detailed information regarding learning environment and its effect on student outcomes, extensive research should be conducted. Especially controversial aspect about learning is if environmental properties create any overt or hidden impact on pupils. Overall, Higgins, S., E. Hall (2005) support this notion by saying:

> The first thing that will strike you is the relative paucity of research on effective learning environments. Not only is the evidence incomplete, particularly in areas such as the systems and processes and communication approaches that schools need to underpin their physical environment, but the research that has been done seems to be largely predicated on a traditional view of 'chalk and talk' learning in standardized 'one size fits all' institutions. (p.4)

In sum, as mentioned above there are major characteristics of effective learning environments from an architectural perspective. Following, the review continues with accomodation of learner needs in relation to physical environment.

Accommodation of learners' needs through considering features of physical environment. The physical environment of a campus should inspire the intellectual and theoretical curiosity and promote social interactions. The physical environment of a campus has potential effect on students and teachers' everyday life in many aspects such as health, work, leisure, emotions, a sense of place, and belongingness. To enhance the educational performance, as students and academicians demand, basic needs to be fulfilled. Nevertheless, the physical environment of a campus should be responsive to the needs in order to experience a healthy development. As Sanoff (2009) explain that in responsive schools where students and teachers would be engaged in different learning activities in and out of the classroom, environment is expected to support these needs. It is essential to gather knowledge about the diverse needs regarding how physical environment satisfies them. John Dewey, for instance, urged educators about the importance of the texture of learning environment in order to meet children's needs.

Campuses, on the other hand, are not only places to gain knowledge or offer courses, they also are places to construct knowledge in a meaningful way for a particular reason. When determining the needs of learners, the student's interests, desires, and abilities must have taken into consideration. The knowledge and skills that the student is interested in and wants to learn should be determined as main aspects of academic development. The basic needs of learners in this development process includes quality teaching, academic and pedagogic improvement, appropriate feedback about their progress, relevancy of curriculum, and physical infrastructure quality as well as leisure activities. Furthermore, maintaining a balance amongst different areas of learning is inevitably important in the organization and planning process of the physical and educational structure of a classroom. Consistent with the campus texture, classroom design is considered as necessity to meet the true needs of the

teachers and students because they spend most of their time in and where the learning process takes place.

Some features of the classrooms can be considered important for enhancing the quality of education. The following stimulating features/conditions make the campuses and classrooms better places. A learning environment consists of a wide set of features that affect learning as:

1. Scale of building, texture, structural shape, school size, aesthetic, rooms and doors, entrances, color of the campus and campus buildings.

2. Size of the classes, ceiling heights, areas for the instructors, windows and windowless classrooms.

3. Furniture, arrangement of furniture, type and materials built and seating arrangement.

4. Individual, group and whole class learning areas.

5. Conference and seminar rooms, meeting rooms and laboratories.

6. Library and reading rooms.

7. Vending machines and trash/ recycling containers

8. Restrooms, trash and recycling receptacles/containers.

9. Social interaction areas like cafeterias, lobbies and lounges.

10. Temperature and heating system of a campus buildings.

11. Lighting of a classes and campus buildings.

12. Air.

13. Acoustic / Noise and noise-proof walls.

14. Green areas and outdoor spaces.

15. As well as these architectural areas dining halls, internet access, technology, dormitories

16. Corridors as well as stairs.

Aforementioned list itemized below in accordance with how literature mentioned. It would be difficult to draw a distinctive line between academic and non-academic features of physical environment. Therefore, above items are reviewed under two main categories though there is some interrelatedness between academic and non-academic features.

In order for the researcher to create a comprehensive understanding regarding to academic features of physical environment an extensive review of a literature has been conducted. It seems proper to select some major characteristics of physical environment under academic features. As indicated above, some features directly related with academic purposes such as items 1,2,3,4,5 and 6, and items like 7,8,9,10,11,12,13,14, 15 and 16 would be considered as in-directly related to academic issues.

The rest of this part is organized under three main sub-themes that are structural features, design concepts, and space usage.

Structural features of physical environment. Texture of architectural environment involves elements. Each element mutually collaborates each other's benefit respectively. For example, safeness, quality of construction, architectural thought, and visual appearance and so forth may create an impact on perceiving the school as an educational institution. (Debs & Brown, 2017)

In contrast to architectural dimension in relation to imagery perceptions, Mcgregor (2003) urges that a strong emphasis should be placed on consisting <u>elements</u>. Since schools are more flexed than before, instead of assuming these places as static or fixed they should be considered as fundamental for creating real communities of learning. There are evidences that lack of reciprocal involvement among elements of physical environment may result with poor conditions and, thus, with unintended learning and teaching (PricewaterhouseCoopers, 2007). Titman (1994), for example, studied the need issue and found that learning requires an area of practicum, stimulated atmosphere for cognitive efforts, and feel belonged to learning

environment, and feeling safe in learning process. Because, buildings by themselves are not sufficient to meet such needs. (Higgins, S., E. Hall, 2005) argue that involving students and teachers successfully continue their learning, the design efforts to effective architectural standings must be more participatory throughout all phases of learning to generate an impact within any educational context.

As well as creating educational setting, shape of spaces should also be supportive to participate students and teachers through furniture organization, and physical hint transmission that silent messages for learners and instructors be delivered properly. These messages of the environment stimulate motion, promote engagement and invite learners to hurry or proceed calmly.

The "shape of spaces, furniture arrangements, and signs are physical cues that transmit silent messages, and both teachers and students will respond. These environmental messages stimulate movement, call attention to some things, but not others, encourage involvement, and invite students to hurry or move calmly" (Sanoff, 2001 p.34).

Similar with what Darling-Hammond et al. (2002) mentioned about the scale or size of a school, (Tanner, 2009) stated that the general tendency is about scale-economic institutions. However, establishing small size neighborhood or campus based institutions promote communities of learning which may have positive effect on learning outcomes (21st Century School Fund, 2009) and (Schneider, 2002).

Since physical environment is inevitably important, there are variety of elements in relation to physical environment in literature. Some of those studies consider this matter from a perspective of age of a building, size of the classrooms, number of window etc., while other have tended to focus on quality and esthetics, safety, appearance, learning ambiance etc. (Debs & Brown, 2017) For example, Appearance of the school has potential to transmit messages either negative or positive. Students internalize any message that buildings or

schools delivers to them and identify themselves through those messages with respect to personal image and develop reputation towards their institution (Blackmore, Bateman, O'Mara, et al., 2011). Greene et al. (2004) study underlined the fact that perceptions students developed about their schools are the main determinant of their motivation and future success. Laursen, Liston, Thiry, & Graf (2007) however, focused on another important point and indicated the learning experience as a public activity. This type of activity make students develop positive sense of education with greater engagement.

Classroom design, on the other hand, is a significant feature of physical environment. For instance, density of classroom may reduce achievement but may have no effect on social interaction and outcomes (21st Century School Fund, 2009) and (Schneider, 2002). Furthermore, libraries have long been considered as a physical environment that promotes individual learning. However, today, development of mobile technologies and wireless learning hubs have influence on designing libraries. Physical dimension of traditional library conception changes toward digitalization in libraries (Londsdale, 2003). In sum, it is possible to conclude that physical environment especially structural dimension of educational buildings are in a process of change based on the needs of learners and learning theories.

Design features of physical environment. General trend in designing learning spaces have been considered architects and interior designers' job — teacher-practitioners are ambivalent. Also, contemporary architectural design preferences dominate educational imaginaries. But there are some exceptions exist. Schools, for instance, derived from existentialist or progressivist educational philosophies resulted with Summer Hill, Waldorf, Reggio Emilio, Montessori, and Dewey type of institutions with their unique design features (Jamieson et al., 2000; Abbasi, 2009). Today, recent design tendency suggest designers to practice more generative design approaches so that teacher can practice in a more professional way and this benefits students positively (Temple. P, 2007). It is a certain fact

that designing a learning environments requires extensive knowledge and expertise in order to create responsive and supporting educational institutions (Dudek, 2012). In fact, expected designs for effective environments must have some agreeable patterns. That means, small details come together and generate a notion for a specific educational setting. For example, space, color, entrance, air ventilation, temperature, security, furniture setting and many more parts are together creating a big pattern or texture in relation to design. Fisher (2004) states that those spaces or features nurture a sense of community feeling, for instance, color used may capture special attention of learners and teachers. Higgins & Hall (2005) assert that though this small details not considered much, there are strong and solid evidences about the impact of basic physical variables such as air quality, temperature, and noise on learning.

In addition to those climatic features, a furniture, for example, is an umbrella term. It includes many different dimensions like desks, chairs, tables, shelves, etc. Type and materials built is also important such as using iron, plastic, and/or wood. Also, esthetics and comfort issues play an important role since those are used during long learning hours. Thus, it is important to support students' needs since they lean forward, backward, write or draw on those classroom items, or lean back to watch only or do some in-class activities. It is evident that research indicates the importance of type and characteristics of classroom furniture may have effect on students' overall physical development, learning behavior, and quality of education (lit rev) In addition to furniture, arrangement of those in a classroom space is very important to promote better classroom performance and behaviors. This may also be related to employing different teaching strategies since teaching and learning strategies have close relation in practicing environment. For instance, spaces that generously designed for learning have constructive effects on outcomes.

Literature frequently mention classroom arrangement from different perspectives. For example, Bunting (2004) indicates that "in the first half of the twentieth century, a

standardized classroom plan was designed where desks were arranged in rows and columns to maintain order and control student behavior. And generally, in this classroom, the usual seating arrangement of rows headed by a teacher at the front that all information comes from. This arrangement assumes a teacher-centered classroom where the learning process depends upon the teacher's direction." However, in today's educational environments, "spaces must attract students to go to, similar to the way cafes and other social dimensions should be available for students, rather than the space being purely functional.

Moreover, Higgins et al. (2005, p.29) contributes to this point as "it seems that different arrangements are required for different teaching and learning contexts. There is a volume of research that suggests less attentive and less successful pupils are particularly affected by the desk arrangement, with their on-task behavior increasing very significantly when seated in rows instead of tables". Classrooms should be equipped with movable student seating, tables and chairs. Small classrooms should have an identifiable teaching wall with marker/chalkboard, one or more projection screens, and telephone/data connections and whiteboard paint is encouraged.

Temple (2007) and Higgins et al. (2005) suggest number of different sources that explain specific environmental conditions and their influence onto student learning. The environmental or climatic circumstances defined are main aspects such as temperature, air quality, ventilation, and lighting (Lackney & Jacobs, 2002). Abdul-Samad and Macmillan (2005) argue for the need to comprehend the real impact of design on a range of outcomes.

Yet there are some design suggestions that may have a diverse impact on engaging to learning. For example, (Read, Sugawara, & Brandt, 1999) consider that wall paint color, the height of a ceiling help children develops cooperative skills. Engelbrecht (2003) also mentions that the wall color of the classroom improves productivity and while others state that concentration may be high if classrooms are painted with specific color. Although chosen

color or physical appearance of learning spaces are paid little attention, (Temple, 2007; Higgins et al, 2005) proper color selection, in fact, has multiple aesthetic and inspiration function. Hamid & Newport (1989) conducted a research and concluded that in a pink-colored room pre-school children present more physical strength and positive mood, but less in a blue-colored room.

Color was presented as an example in interpreting the interior design factors. On the other hand, the design of outdoor or external spaces has a number of factors that affect learning. For instance, Blackmore, Bateman, Loughlin, O'Mara, & Aranda (2011) state that:

> …the principles of environmental sustainability have been integrated into the school design and are expected to be sustained by having children involved not only in the design but also in the care and use of the outdoor space in teaching and learning. Indoor and outdoor spaces need to be designed with play in mind. Critical to outdoor design is student safety and security, as well as privacy… (p.27)

Reggio Emilio schools, for example, have been designed on this principle (Ceppi & Zini, 1998). Also, Gislason (2009) found that:

> …in a senior environmental college, the schools design was a scaffold for the curriculum and interdisciplinary pedagogies. An outdoor pond and outdoor classroom were springboards to curricular units and nurtured a pro-environmental attitude. The students indicated preference for 'natural environment' (which included facilities) as against confines of classroom and applied learning had positive psychological effects. (cited in (Blackmore, Bateman, O'Mara, et al., 2011, p.15)

Another design example is Forest Schools. They are designed and supported by the Scandinavian thought that contact with nature is important in developing students' physical and cognitive skills. In addition, confidence, independence, social skills, awareness of actions, team activities, communication, motivation and concentration, motor skills, and

understanding of natural surroundings and respect to environment were other developmental skills of this approach.

The way campus milieu be transformed into a learning or learner-friendly organization. School as learning organization is not only an institution or educational environment where certain knowledge and skills are given for learning, its milieu has to prepare students for real life experiences. The criterion of better learning in teaching is that the student can use his/her knowledge effectively at home, at work, and in social relations and activities. There is a clear link between better learning outcomes and organization of a school. Better learning outcomes may have a close connection between environmental quality of schools and educational performance. Shaping the students' attitudes towards learning and developing positive teaching environment for teachers as well as staff, inevitable aspect in this learning experiences main dimension is the quality of the school environment. Through a positive learning environment with proper learning experiences, positive attitudes develop and that effect teaching and behaviour in an appropriate manner.

With regard to quality in learning, there is a certain criterion for school buildings and design in relation to the key actors of learning experiences who are students and teachers. Their specific age groups, social needs, professional practices determine the quality, shape, physical environment, architectural structure, and many other aspects of school settings as well as   regulations relating to usability and safety (Heitor, 2005).

As campus milieu is a combination of various aspects and presents many opportunities to its occupants, transformation of campus towards student or learner centered institution is gaining importance. It is important to delineate special features of learner friendly campus. This could easily be considered as just meeting the needs of students. However, it is more complicated than just meeting the various and diverse needs. It could be considered that through meeting the needs, campus residents develop further attitudes toward their institution.

For example, improved social relationships, respect to others, responsibility, and *sense of belonging* should be main outcomes for learner friendly campus (Moore & Wong, 1997).

During transformation process administrators have the primary responsibility. In order for administrators to initiate a transformation toward learner friendly institution, they should develop awareness regarding the needs of faculty and students. If renovation efforts processes through a team thought, all resources and infrastructure can be elevated for student use (Oblinger & Lippincott, 2006).

Based on aforementioned, transformation of campus to a learning environment may have many diverse dimensions. However, specific to this study, the main dimension identified is administrative because making an administrative decision to initiate a transformation is a challenging effort. In fact, it should not be one man's effort, but a product of team work. Every individual may carry a responsibility in a transformation. (Dudek, 2005) clearly explicates this joint effort and its outcomes:

The labyrinth is a constructed journey, which because of its physical qualities promotes contemplative thought, and supports personal development. Throughout history and in many cultures around the world, the labyrinth has symbolized the notion of rebirth. The idea being, that by travelling in and back out, one has grown, changed, been renewed and transformed. I use the word transform purposefully as it implies a change in form and this is appropriate when discussing design. The type of change is not brought about by manipulation, distortion, or mutation. Transformation is closer to the kind of change that a caterpillar goes through in order to become a butterfly; its essence emerges as part of a natural organic process. The labyrinth is designed specifically to bring about a transformation of spiritual dimension. (p. 23)

As Dudek (2005) emphasizes, administrators need to differentiate transformation from manipulation, distortion, or mutation. Also, change process needs to be natural, smooth, and

consistent. It would be acceptable that most administrator may lack in technical, functional, or academic knowledge and perspectives of the change process, but through establishing an experts group would heal this deficiency. Also, most times administrators are not main users of goods and services, but supervisors.   There would be numerous factors affecting administrators to make correct attempts to start a change. However, a group composed of educational scientists, architects, faculty members of a specific schools, students, engineers, and other related individuals may contribute to change more competently. ("National Curriculum Framework", 2005) emphasizes this from a different perspective:

> Creative and practical solutions can be used to improve schools' quality and meet children's [students'] needs while repairing or upgrading existing schools or making new buildings. Although school buildings are said to be made for pupils, they are seldom able to influence the way in which they are designed because most of the decisions are usually made by administrators, public officials, builders, architects, and others, who, in most cases, will not be the users of the finished schools. (p.80)

In conclusion, understanding the ways of change efforts in making the campus a learner-friendly environment was one of the research questions. Although the change process has multiple dimensions, this study specifically focused on administrative point.

As technology changes and develops, job types and opportunities also are being radically redesigned. New jobs will appear requiring new skills, but more importantly, along with the change people need to adapt themselves and think creatively. The size and speed of change will mandate universities reshape themselves.

A mentioned before, transformation of campus is not just new buildings, designing classrooms, library organization, measuring the height of curb, or expanding green areas, the next phase a higher education institution is about surviving in 21st century. Universities have responsibilities in providing opportunities for talented and workforce (Wonkhe, 2018).

Trought (2016) says that expectations from university have transformed students to be more careful consumers of knowledge higher education. Graduates want to guarantee their employability, and this resulted with questioning further about what to search for when selecting an appropriate university. Administrators, on the other hand, should carefully focus on the demands of students. Trought (2016) itemized, students' demands under four main themes "work experience and volunteering opportunities, opportunities for international experiences, university links with industry partners and professional bodies, and incubator facilities and engagement with start-up communities". These four items clearly explain the direction of the change process and could be considered as a guide for higher education administrators to start transformation process. It is important that even campus architecture could be shaped based on these four themes.

Finally, it can be concluded with a quotation from the book named "Building the 21st Century Campus":

Listening carefully to the leaders, and analyzing what they and others are saying, led us to four variables that we think help define the shift in higher education thinking: Institutional Flexibility, Student Mobility, Pervasive Technology and Return on Investment. These four variables are part of the 21st century higher education mindset for the entire campus culture, not just for leaders, but for faculty, staff, alumni and students. (Segall & Freedman, 2007, p.15)

Chapter Two: Methodology

This chapter is divided into three major sections. The first section of this chapter explicates the research design and the research process in relation to research questions and related sub questions posed in chapter one. It was important for the researcher to underline how school architecture and learning environment interact with each other and how this interaction results with effective learning. For this purpose, data gathered to explore different dimensions of architectural structure and learning process. The second section explains population and setting and the collection and analysis of data for the study. And the third section ends with the re-analysis of the data that obtained from previous two sections.

Overview of Methodology

This study mainly concentrates on the relationships among school architecture, its effect on learning experiences, and providing suggestions for better learning environments in terms of architectural and educational dimensions. In order for the investigator search these different dimensions, Çanakkale Onsekiz Mart University and its constituents from an architectural point of view towards students' learning experiences considered pertinent to conduct such a study.

The nature of this investigation requires multiple ways of looking at the different parts of the study from different dimensions. Hence, a qualitative approach that includes observations, site visits, interviews, document analysis, questionnaires, expert opinions as well as opinionnaires, and other source of data gathering instruments employed to gain an in-depth understanding to explore than to explain the interactional features of learning environment and learning.

Observations and site visits have started in the fall of 2017 and continued through spring 2019. The departure point of this study was investigator' observations in relation to campus and its utilization by students and academicians. Later, based on the primary data

gathered through observations, site visits considered to be essential to elaborate what have seen. At this stage, researcher's aim was to gain an appropriate knowledge about students and academicians' opinions on school architecture and its effect or contribution to their learning experiences. Both observations and site-visits deliberately focused on the campus and the buildings since the main concentration was on the external environment. For the second part, the main area of concern was on the internal environment of the campus buildings. In addition to primary knowledge gained from observations and site-visits, individual face-to-face interviews were considered to be necessary to expand what others think about the same phenomenon that is external and internal environment. Therefore, academicians, students, and administrative and service personnel from different departments considered as rich information sources. Throughout these interviews, primary goal was to determine whether individuals who share the same environment are aware of things happen around them. Based on the evidences gathered at the earlier part of the study and collecting adequate information, a questionnaire later named as "Questionnaire for Determining the Relationship between Learning and Learning Environments" was developed and conducted to shed light about possible relationships between school architecture and its effects on the students' learning. This questionnaire included 8 main parts related to both internal and the external factors which contribute to the learning process (a) building, (b) campus, (c) classroom, (d) library, (e) social spaces, (f) technology, (g) safety, (h) Health/Welfare Facilities.

After employing the questionnaire to a representative population and analysing the data, researcher again considered to investigate the situation from a qualitative manner. Based on the adequate information from all rounds of data collection, the investigator analysed all information by making comparisons and categorization in order to conceptualize the context of relation between architecture and learning in a campus life from the perspective of exploring, describing, explaining, and interpreting.

Research Design

This study mainly concentrates on the relationships between school architecture and learning. Specific purpose can be stated as whether the texture of a campus has any contribution to students' learning experiences. Therefore, in order for the investigator to figure out if this relation really promotes better learning and how campus environment support this, qualitative research design was considered to be appropriate for this specific purpose. As Yin (1994) indicates that research should be designed as a function of the research situation and each research design has its own specific approach to gather and analyze experimental information, and thus each methodology hast its own benefits and drawbacks. Even Though a diverse collection of producers is labeled "qualitative research", many share some distinguishing characteristics. While considering an appropriate research methodology, researchers' debate generally centered on two methodological types-- Qualitative and Quantitative. Qualitative research focuses on words and observation to describe natural situations of people mainly in narrative format while quantitative each concentrate on opinions and notions presented in numbers. Nevertheless, data referred to issues relating to individuals, objects, and circumstances are qualitative (Berg, 1989, cited in Miles Matthew & Huberman, 1994). Especially pertinent issue in here is about necessity of applying qualitative approach since the main consideration is centered on real-life events and situations as well as observations. Moreover, qualitative data allow gathering rich information to provide in-depth descriptions and explanations in relation to real-life and its contextual standing. In sum, having long-standing data collection period makes qualitative strategy useful because data gathered from multiple settings, in different times, and through multiple techniques provide more robust information.

As suggested by Miles Matthew & Huberman (1994), a triangulation of various types of qualitative instrumentation is recommended to validate data and to provide rich

descriptions of the study group. Also, qualitative research involves the empirical collection of data. Therefore, the researcher personally becomes situated in the subjects' natural setting. Miles and Huberman (1984) described the reasons for selecting a qualitative research approach for this type of study.

Something is known conceptually about the phenomenon, but not enough to house a theory. The researcher has a fairly good idea of the parts of the phenomenon that are not well understood and knows where to look for these things--in which settings, among which actors within which processes or during what class of event. Finally, the researcher usually has some initial ideas about how to gather the information--through interviews, observations, document collection, perhaps even with a well-validated instrument that will allow for some comparison between the proposed study and earlier ones. (Miles & Huberman, 1984, pp. 27-28)

In this study, the qualitative design was selected to facilitate an in-depth exploration of the relationship between school architecture and its effect on learning outcomes. With this qualitative design, the investigator expected to explore whether or not the physical characteristics of schools directly influence learning outcomes. In other words, this study was designed to determine whether or not the school design and building structure create an important impact for learning as well as teaching.

Qualitative research can be defined as qualitative data collection methods such as observation, interview and document analysis, and a qualitative process emphasizes on realistic and holistic presentation of perceptions and events in the natural environment (Yıldırım & Şimşek, 2018).

In addition to Yıldırım and Şimşek, Huberman and Miles (1984) call researchers' attention to the visible differences between qualitative and quantitative studies and why a researcher should choose a qualitative approach for a specific study.

In light of these facts and based on the literature review this study is designed as a qualitative study in order to explore whether or not physical structures of a campus construct any effect on learning experiences

In the context of this study, multiple data collection methods were used. Using multiple data gathering approach from multiple information providers is more convincing and accurate (Yin, 1994). Also, it was the best approach to provide a variety of evidence including observation notes and forms, formal and informal interviews, and discussions. Data collected through observations helped the researcher to identify the contextual environment, participants' perceptions, and campus milieu (Prus & Jorgensen, 2006). Interviews also provided understanding to interpret the observations through participants' point of views and experiences.

Population and Settings

Although architectural dimension of educational institutions is an important subject to consider, only a few studies have been focused on the school architecture and its effect on learning. Therefore, school or campus architectural structure and the most appropriate design issues that causes a positive learning environment was the area of interest in this study. Therefore, it was extremely important to gather data that would shed light on the relationship between school architecture and its effect on the learning.

The research participants included three different informant groups:

- 25 university students from Educational Faculty, Biga Economics and Administrative Sciences Faculty, Biga Vocational High School, Ezine Vocational High School.

- 161 first, second, third, and fourth grade university students for 94-item questionnaire part

- 5 academicians from different faculties who teach at Canakkale Onsekiz Mart University,

- 1 administrative and

- 1 service personnel were selected.

- Observations were conducted at faculty buildings of each department were located in Canakkale Onsekiz Mart University in the center of Çanakkale and in the Çanakkale district.

Table 1 describes the settings and general information about the informant groups.

Table 1

Demographics for Study Participants for qualitative part

Schools	Number of Students	Number of Teachers	Grades of Students
Educational Faculty	18	1	1st and 2nd Grades
Foreign Languages		1	
Vocational School of Marine Technologies		1	
Biga EAS Faculty	2	2	1st, 2nd, 3rd, and 4th Grades
Biga VHS	4		1st, 2nd, 3rd, and 4th Grades
Ezine VHS	1		1st, 2nd, 3rd, and 4th Grades

Variables affecting population

The variables defined and operationalized in this study were:

1. Academicians' number of years in teaching.

Academicians differed in terms of years of teaching and, therefore, were divided into two groups experienced versus less-experienced. Teachers with five or more years of

teaching were labeled experienced and those with less than five years were labeled less-experienced.

2. University students

Students differed in terms of their years at campus. This was considered important to the data collection process because they spend their week-long full days around university and have chance to observe.

3. University administrative and service personnel

Interviews with administrators enabled the researcher to gather detailed information about school architecture, learning environment and its effect on students learning. In order for the researcher to gain adequate information about school architecture, administrative, service personnel, university students and academicians' opinions and feedback were taken.

Data Collection and Analysis

Observations and site visits were begun in the fall of 2018 and continued through spring of 2019. Besides observing the building and the environment under working conditions, school building observation form, formal and informal interviews, a collection of data-recording forms, evaluative comments about physical setting of school and appropriate qualitative research design was undertaken for the purposes of determining the effect of school architecture on learning outcomes.

Observations provided valuable information about school architecture and learning environment that interact with each other and how this interaction results with effective learning. Observations were conducted in two parts. For the first part, the investigator's main focus was on general aspects of connection between learning and environment.

- School architecture (Buildings, Classrooms, Social areas)
- School internal and external learning environments (location, student body, teachers, neighborhood, etc.)

- Educational buildings (Faculties)

- Physical conditions

    For the second part of the observation, the main concentration was:

- Campus environment and students' interaction with each other.

- Students' opinions about the physical environment of a campus.

- Students' opinions about the appearance of the buildings

- Campus effectiveness in meeting the needs of students

- Students' opinions about the conditions of school buildings.

- Students' learning outcomes.

    Individual face-to-face interviews were conducted with the participants. Throughout the data collection university students and academicians were interviewed. However, initial analysis of the first part with 25 students' interviews provided information for the second part. For the second part of interviews five academicians from different faculties were selected.

    Areas focused on during the first set of Student Interviews were:

- Years of experience in teaching

- General opinions about school architecture.

- How should be the characteristic of the learning environment

- In what ways school buildings effects students' learning experiences

- How school architecture would be beneficial to learning process

- Expectations from campus

- Effective learning outcomes

- How change in physical environment improve teaching/learning

    Each interview was audio recorded, transcribed, and coded for analysis.

Round One Data Collection. Stage A:
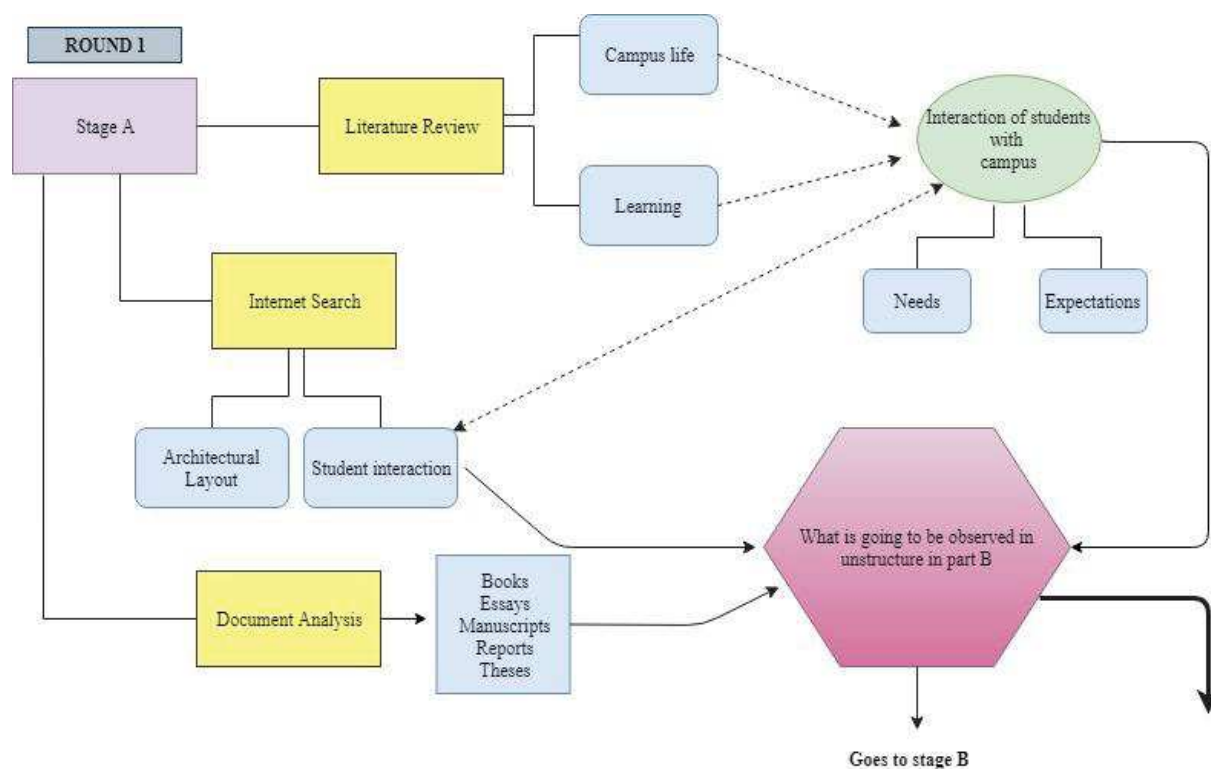
Figure 1. Qualitative data analysis process round one stage A.

Round one can be considered as departure part of this broad study. Since there is limited information about campus life and its contribution to learning process in the literature, researcher thought that it is essential to begin with what have been said previously, if any. With the idea in mind about campus architecture and students' interaction with this as well as students' needs and expectations from the campus during their college life, internet search was considered inevitable to understand what is conducted, so far, to explore the interaction among architectural features of a campus and students' experiences. After preliminary search reviewing numerous books, essays, manuscripts, academic articles, reports, and theses, documents collected and reviewed during this process were analyzed based on both conceptual and contextual structure to gain more comprehensive understanding about what needs to be observed during following steps of the study.

In addition to reviewing step, Round One data collection continued with the initial fieldwork and observation to gather preliminary data to develop instruments for the following steps. After conducting site visits and review of literature between fall of 2018 and spring of 2019, the main idea with respect to architecture and learning was generated in researcher's mind.

Next, during site visits, raw data were gathered through informal talks with the students, academicians, and staff. Notes were taken during these talks and informal interviews, researcher also digitally recorded her own observations in order to prevent data loss.

To identify how school architecture and learning environment interact with each other and who was involved in, observation has been conducted to identify things that have not been thought in advanced. During observations, checklists are also used when there are worth-seeing action or attribute to be observed.

Stage B:
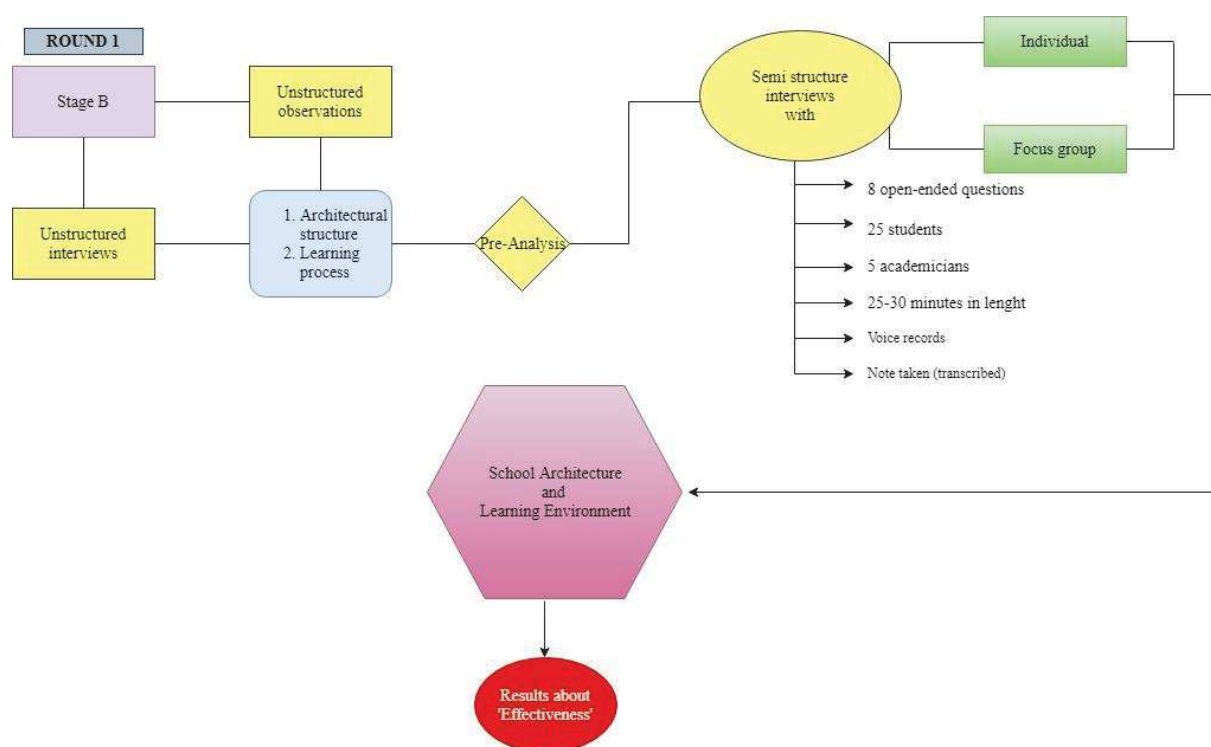
Figure 2. Qualitative data analysis process round one stage B.

Unstructured interviews and observations helped researcher's investigation to explore different dimensions of architectural structure and learning process. Throughout the unstructured interviews, the researcher asked questions to participants related to the framework of the research topic. Based on the information gathered at stage A, semi-structured interviews were conducted (3-items questions covering the major and sub-dimension questions) which was developed after early site visits and observations.

Interviews with students were conducted individually and in groups. In order to overcoming shyness some students preferred to be interviewed individually. Depending on academicians' preference, semi-structured interviews were conducted to explore their views and personal commitments.

Face-to-face interviews with the students guided by 8 open-ended questions. Each interview lasted around 20-35 minutes in length. Similarly, one-on-one or with an e-mail, academician interviews were conducted. In general, the interview questions focused on in what ways school architecture and learning environment interact with each other and how this interaction results with an effective learning.

Some students' interviews were conducted by telephone. All interviews were audio recorded and transcribed. After each observation and interview sessions, the researcher discussed her own observation notes with students and academicians to compare their opinions and compare with the researcher's observation notes.

Round Two Data Collection.
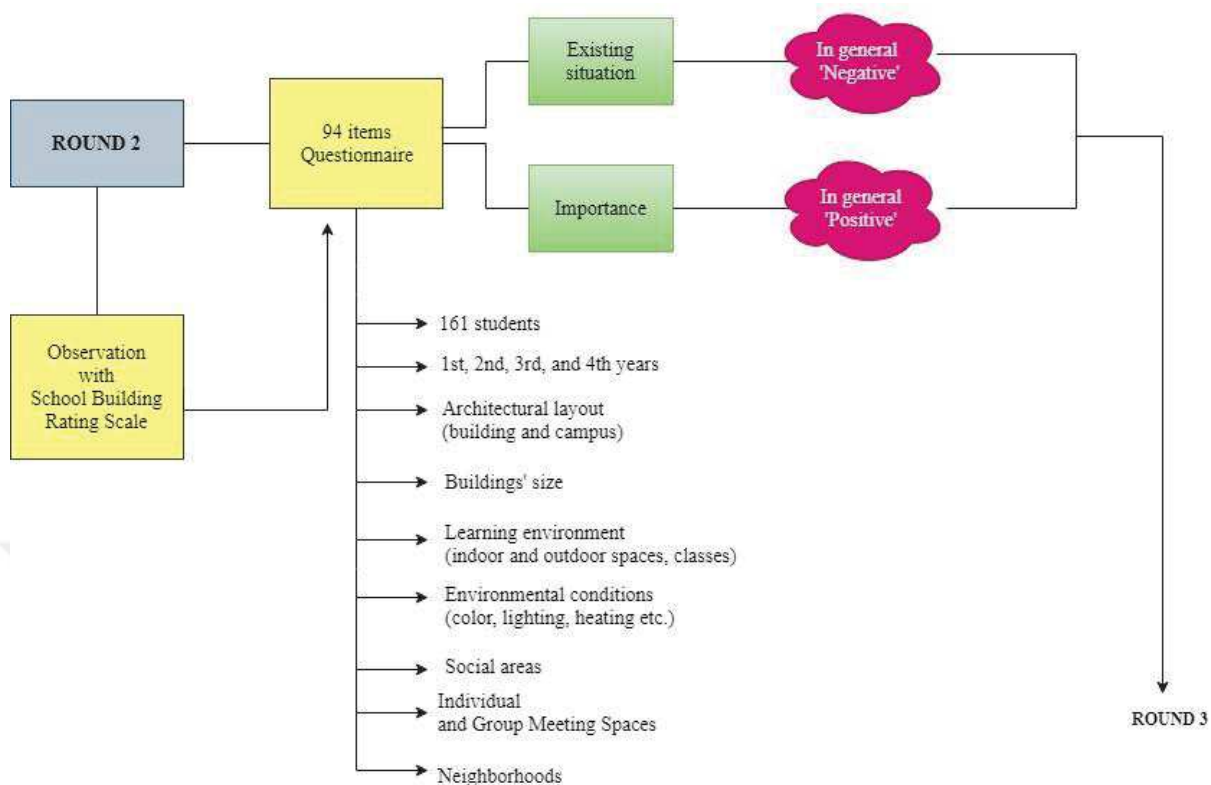
Figure 3. Qualitative data analysis process round two.

Information gathered at round 1 in stages A and B, a questionnaire was developed to investigate how many large numbers of students perceive campus environment as learning place. In order for investigator, it was important to gain information from a larger population to develop the next part of the data gathering process that is about explaining what has been collected so far in detail.

For this part of the data collection, 94 items questions were prepared and implemented. The 5-likert type survey included two columns. One was questioning the existing situation of campus architectural features and the second one was about students' perceptions regarding their importance level. The purpose of collecting quantitative data at this state was to establish a base for the third round data collection. Although unstructured or semi structured data collection parts provided a valuable information, employing questionnaire helped researcher to distinguish whether preliminary data collected during first

rounds is sound enough. Later, 94 items survey results underlined the fact that the next round of data collection could be under main themes that arose from confirmatory factorial analysis. Unstructured and semi-structured interviews collected during the 1st and 2nd rounds allowed researcher to identify what to make and how to make following observations and interviews about learning environment and school architecture as well as assisting for preparation of Round 3.

After preliminary analysis of Round One and Round Two data, the researcher conducted a questionnaire which was developed to investigate how many students perceive campus as a learning place. During conducting questionnaire, the researcher focused on 7 pertinent topics which needed to be addressed to complete the data collection in round 3.

161 students were included in the second round. In questionnaire, 161 students addressed the following topics:

(1) Architectural Layout (building and campus)

(2) Buildings' Size

(3) Learning Environment (indoor and outdoor spaces, classes)

(4) Environmental Conditions (color, lighting, heating etc.)

(5) Social areas

(6) Individual and Group Meeting Spaces

(7) Neighborhoods

Round Three Data Collection.
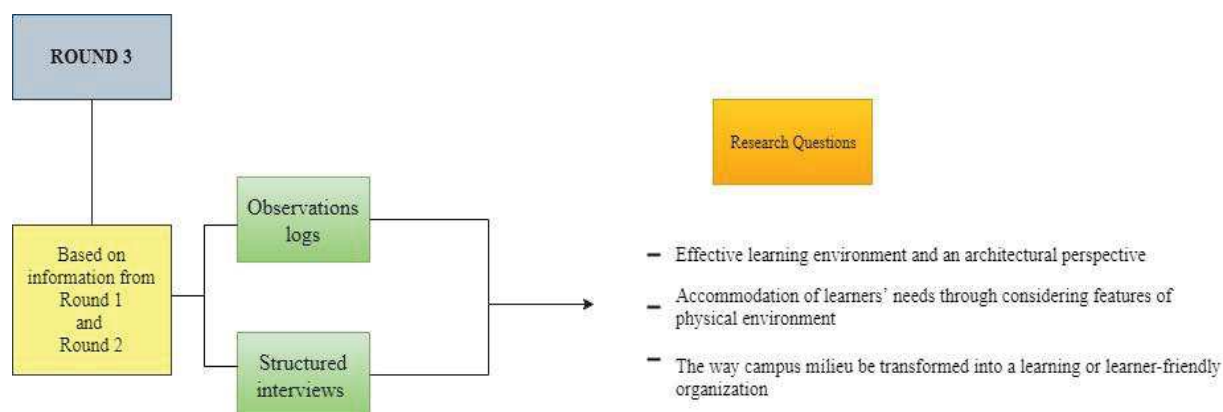
Figure 4. Qualitative data analysis process round three.

   This round was more structured based on the data gathered from previous two rounds. Structured interviews with participant conducted. Also, based on the information of previous two rounds observations logs developed and structured observations were conducted. Documents, on the other hand, were analyzed by concentrating the sub-dimensions that was the result of both survey and previous rounds.

   Trustworthiness

The trustworthiness of the research findings is one of the essential concern to be taken into consideration in qualitative or quantitative researches (Creswell, 1998). Determining the trustworthiness of a study shows the believability of the research, as Creswell (1998) stated: "Trustworthiness is an active part of the process of a research and becomes part of the standards one should use to judge the quality of the study" (p. 209). In this regard, researcher must consider some strategies to verify accuracy of the data collection, analysis, and interpretation methods used. In this study some methods were used as follows:
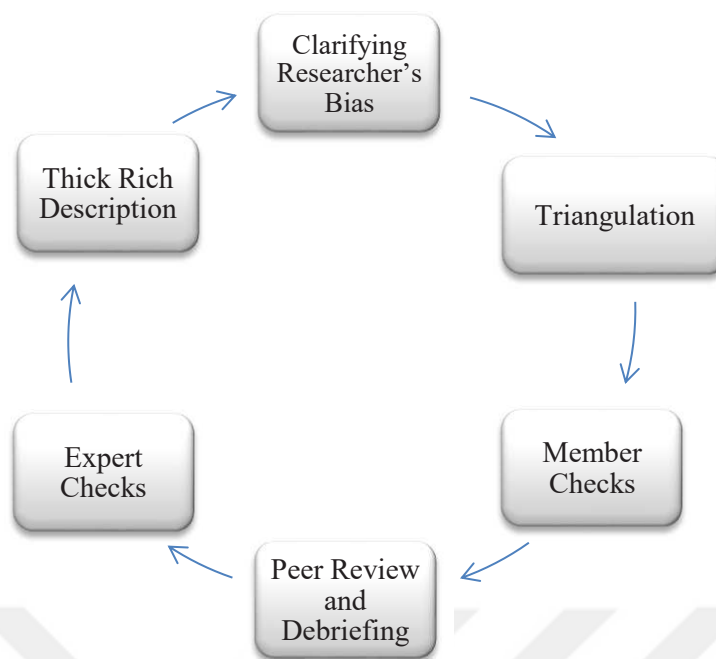
Figure 5. Trustworthiness methods in qualitative research.

Data Analysis

In each round participants' responses were determined by using analytic codes to characterize the themes and patterns of the student and campus interaction. In addition to analytic codes, since the respondents were asked to answer interview questions based on their experiences and in their own words, the investigator needed to identify categories that emerged from the answers. For this reason, responses were coded according to categories of architectural patterns and effectiveness in learning. Some responses that did not fit or consider irrelevant and those frequently overlapped within the categories were separately coded and grouped.

Similar to data collection rounds, analysis were conducted in three rounds. Analysis of the first two rounds were used a source for round three data collection. Therefore, the results part of this study mostly includes the round three analysis results.

Coding the data by starting labeling enabled the researcher to count the data and determine the frequencies of responses made by informants. Furthermore, the researcher used

both interview responses and observation notes to a greater extent of data analysis by merging them under the same categorical groups.

In order for the researcher to deal with a mass amount of information collected through observations and interviews, following analytic codes were developed and used to check the representativeness of responses and for data reduction of categories.

Chapter Three: Findings

Introduction

Studies show that there are many different dimensions of learning and the environment in which learning occurs. Numerous studies conducted about learning and school environment at primary, elementary and high schools indicate that school milieu has an effect on students' achievement whether positive, neutral and/or negative. It was considered important to conduct a similar study at a higher education level since college education includes multiple subjects, departments, programs, colleges, schools, faculties, and so forth. This plurality causes different needs, expectation, and demands. Campuses, however, are main environment for college level students where they learn, socialize, and spend most of their time. Though there are different types of campuses, most of them are in or near the cities so that students can get access to city life to fulfill their personal and academic needs. However, in today's higher education, educators believe that campus life is the main determinant of successful learning experiences as well as creating effective learning communities. Hence, the main aim of this study was to first explore then explain whether physical situation of a campus construct an effect on learning experiences at a higher education level. In order for the researcher to reach meaningful results, campus life has been divided to its constituents. This chapter provides findings regarding to the major research question, that is, "In what ways do physical *texture* of a campus construct an effect on learning experiences at a higher education level?" Therefore, interviews and observations were primary data in exploration step. Later, results deducted from exploration step were combined with document analysis to explain what has been found and what the meaning of findings are in relation to campus structure and learning experiences. Findings were presented under three main themes based the sub-questions related to main research question. At the end of this chapter there is also a brief summary of how physical and architectural features of a campus may related with effectiveness in learning.

Sub Questions:

1. What are some major characteristics of effective learning environments from an architectural perspective?

   - Findings related with the effectiveness of learning environment

   - Findings related with characteristics of architecture

2. How physical environment of a campus should accommodate the needs of learners?

   - Findings related with accomodating personal needs.

   - Findings related with accomodating academic needs.

3. In what ways could campus milieu be transformed into a learning or learner-friendly organization?

   - Findings related with campus milieu

   - Findings related with learning or learner-friendly organization.

This part of the chapter related with characteristics of effective learning environments and architectural perspective provide information that was gathered throug interviews and observations. Data collected from participants related with effectiveness of learning analyzed from architectural perspective. It is obvious that effective learning environments have many constituents but this specific study primarily focused on campus atmosphere such as flexibility, social areas, distances, study rooms, technology-driven workspace, computers, physical structure of the campus, campus location and access, visual attractiveness, harmony with environment, size of buildings, faculty garden, classroom design, interior design, architecture, dormitories, disability access, library, and security units.

Findings

Related with the Effectiveness of Learning Environment

Effectiveness in the Classroom. There is a common understanding about a classroom concept—in a cubic room, there are chairs, desks, a board, teacher's table, and some other

basic materials. However, in this era, perception about a classroom seems changed. Students do not want to be placed into traditional row type classrooms. Review of interviews indicated that students' responses varied regarding their needs in the learning environment. Initially, six of twenty-five students emphasized that flexible learning environments should be among the main features of effective learning. They also added that creating an effective learning environment requires components such as desirability, usefulness, and effectiveness.

One student (S25) mentioned that, "If they want us to develop better cognitive thinking and learning skill, they [administration] should consider establishing high quality and well planned *effective learning* areas [classrooms] that support personal and social development together" During the formal talks, one of the students (S13) indicated, "One of the factors effective in learning is the environment where the student receives the information. The comfort of the desks in a class, their suitability to the size of the students, and many other issues have influence on learning". Another student (S5) added as well as having comfortable chairs and desks, "Factors such as having sufficient space and *flexible chairs* to use during activities are necessary for an effective learning."

Among all six students repeatedly commented about "*flexibility*" by stating no matter which basic seating arrangement is used, it must be flexible enough to permit the activities in the classroom. Although students were from different departments, they agreed on similar ideas. S18 from school of education stated the effective learning environment as:

> To create a place for multiple types of learning activities, classrooms need to be more practical and interesting, the desks and chairs should be *moveable* and suitable for use in the classroom (debating, mini-theater, etc.) rather than being mounted on the floor.

S9 from Biga MYO pointed out that "It is seen that many physical environmental conditions such as class sizes, number of students in the classroom, and even how the rows are organized shape the educational activities and affect the behavior of students and

employees [instructors]". Consequently, S16 expressed: "The desk order should be like everyone can see the board and attend the lesson".

In addition to interviews, informal and formal observations indicated that seating need to be reconsidered. For instance, mounted chairs limit students' movement during in-class activities. Moreover, most students seemed uncomfortable since the seating is mostly arranged in rows. Observations also showed that lack of flexibility in seating arrangement results with loosing concentration. Furthermore, documents analyzed related with seating and its effectiveness in learning process. Illustrations as well as different pictures in those reviewed documents exemplifies appropriate and alternative seating arrangement and effective learning.

Though pictures analyzed state the importance of appropriate seating arrangements, observations provided information that in most classrooms arrangements of seating positions are somehow neglected.

It was interesting to find out that students emphasized the importance of distance between the whiteboard and the rows. This was very important concern for S13. He mentioned that "Classrooms must be designed with a good viewing angle". One of the most effective factors in learning is the suitability of the desks to the height of the student and for students to be able to see the board from his/her seat. In addition to interviews, informal and formal observations indicated that one of the most problematic conditions of classrooms is comfort of the desks and size of the chairs since each student has different physical body composition. These physical differences may be natural, but it should carefully be considered such as left-handedness, overweightness, and so forth.

Although there are various dimensions of classroom from interior design perspective, the main concern for this study is to hear what students feel about their classroom and to observe if they are satisfied with their classroom from the effectiveness perspective. It was

noticed that most of the students have many things to mention regarding the effective learning. However, a large amount of information gathered thru interviews and observations was the subject of data reduction process since the most of the knowledge gained from participants were considered as related to other studies rather than architectural point of view. Therefore, raw data was analyzed through employing data reduction processes. Also, the researcher felt that data was saturated since most of the participants mentioned very similar points. Although the intention was to gather data from a broader perspective, participants somehow were reluctant in providing clear information. There would be reasons for this, but the researcher concluded that in many instances students are not aware of how classroom design issues impact effectiveness in learning. Hence, responses were either to narrow or concentrated on only basic features of involvement of architecture to effective learning.

Out of Classroom. A person is not necessarily be an educator to understand the importance of the role of architectural form of a campus. Learning happens everywhere and should not be condensed in to lecture periods and into classroom walls. Today, interaction and learning occur through very different platforms. Diminishing this interaction to formal learning traditions is outdated yet inefficient. External areas of classroom walls could also be considered a learning environment. However, these areas should be designed as appealing to learning process.

Throughout the interviews students indicated that effective learning can occur when campuses meet the social and emotional as well as their academic needs of students. Nearly more than a half of the students explained that there is a reciprocal interaction between physical and social environments. S18 highlighted the fact that "The schools are not only buildings where we enter and listen to the subjects from the instructors. During our college years, we should be provided with different opportunities to develop ourselves both in our own fields of study as well as in social life." Especially S16 asserted the places such as

activity/hobby areas should exist in order to help students get relief during the break time. She explained that, "We come to university in our youngest and most active times. We want to have fun, besides learning." S14, S20, and S22 support the idea in relation to the quintessence of social activity areas in the campus buildings. "…There should be available and interactive places, especially during spare time or lesson-breaks, so that we can motivate ourselves to our classes more…" Moreover, they added that university campus in-door activities, social areas, and in-class activities should be attractive. Students continued to talk about the effectiveness of social activity areas on students' learning process. For instance, S25 indicated that:

> …The more systematic the campus environment, the better the social and academic life. Educational success of the students is related with positive classroom environment. Environments like outer spaces, and the social activity areas are the most used places among all. Of the 24 hours, we spend only half or a bit more of a day in buildings. After all, campus is our neighborhood, home, and even edutainment place.

> In addition, S4 also stated similar idea: "It is important for students to participate [together] in different activities. The lack or limited social environments of the campus creates disappointment… technology, however, should be included in some social activities so that students' participation can be increased."

> Moreover, S12 who thinks creating an effective learning environment is not about only cafeterias and lounges, and explained that, "There should be a learning environment with different social activities rather than cage-like cafes… They are [cafes] not good enough, nothing more than kahvehane [tea place]." Also, S6 stated that:

> The campus is the area where students socialize. The friendships established in the classroom or lessons continue in social life. This type of interaction could result with academic collaboration if campus enables and/or encourages students work together,

harder and result is success. In fact, classmates continue their academic and personal relationship in a socially appropriate environment.

While nearly all of the students perceived social areas as necessary places that creates social involvement, interestingly one of the student (S19) stated an opposite idea by saying: "Social activities around learning environment detach me from my lessons and my concentration easily shifts to other places or things" Such a response was surprising because except one all students commented on social areas as encouraging for socializing and studying. S5 believed that, "the students will be more diligent as they see the appropriately presented environment exists with various activities and opportunities." In addition to this, S7 stated that, "through creating various active environments in campus, students can be physically and mentally healthy, and, therefore, effective learning could be at maximum."

One student perceives cafes and lounges differently. Social areas like cafes may serve as game saloons. S13 confessed that:

> There need to be more social activity areas on campus. For example, opening billiard or rummikub saloons could be considered. The more students are forced to stay and spend more time on campus, the more learning takes place. These, all, effect learning.

In addition to interviews, informal and formal observations indicated that among students of different departments, social areas are perceived quite different in terms of their effectiveness and necessity. While some students considered campus social areas as contributor to success, among many students the concept of 'social areas' being assumed as a leisure and recreational spaces with no connection to learning. Some also stated that having social areas near the learning places are distractors and create isolation from the learning.

Interviews shed light that nearly more than half of the students perceived social areas as an escape fields from school routine. In fact, other students confirmed that that these social spaces are not for escaping purposes from learning, but the opportunity for exchanging

information as well as socializing. In addition to interviews, it was observed that most of the participants agreed upon social areas as neglected places-- by the administration-- and they are far from being supportive learning spaces. Thus, one of the student's response could be a warning sign "…It can be concluded that lack of proper spaces which support learning and leisure at the same time have limited effects onto students' academic development and result with alienation instead of encouragement…."

Availability of individual and group study rooms. Previous results of this part were mainly about the classroom structure and social environment in relation to how design issues effects learning and socialization. Continuing with the similar orientation, establishment of a campus requires careful design considerations. It is an essential dimension to include private or group places to enable students develop themselves personally as well as academically. Since students of different higher education programs demand different study environments, campuses should be designed by considering individual study habits and needs.

During interviews participants mentioned that availability of individual and group study rooms are important for academic development, especially, for group or teamwork type of studies. However, of the twenty-five only three students expressed their opinions about this important issue. For them, one of the stimulating features of the effective learning environment is a place for individual, small group, and whole group learning. Because, some students can acquire a habit of working together while other prefer to study alone. S12 stated that:

I think learning by coming together in groups would be better and effective…
Therefore, there should be spaces that enable us to be in a group-work. But, this group-work environment should be outside the library or faculty buildings since the library obliges us to be silent at all times. There should be places specifically assigned for us where we can work as a group.

S6 mentioned multi-purpose learning areas as one of the basic architectural features of effective learning environments "…Such as reading and group or individual study area." S20 said that, "There must be active environments rather than traditional room approach. For example, instead of classes or cubical next to each other, different learning environments that are rich in every aspect should be established." Based on the observations, students generally go to main library to study. Especially, during midterm and final time, library is loaded with students. Most of the time it is impossible to find even a single chair though the main library is big enough. However, extra areas for different learning needs and for students from different programs would be considered as an effective aspect of a design issue. While making observations on campus, it was witnessed that there are plenty of available areas left unused for educational purposes. With minor modifications these areas could be used for students' benefit. As mentioned frequently throughout this study, architectural design and understanding learners' need are important in creating well-organized campuses.

Technology-driven workspace. Data gathered for this study underlined that architectural design mistakes or inefficiencies may be circumvented through well-established technological infrastructure. As mentioned before, there is a great need for individual and group study rooms. However, technology would ameliorate the lack of those rooms through providing opportunities for digital communication.

During the interviews, another concern was on receiving information-rich technology to increase functionality of students. They assert that it does not matter how well the classrooms are organized, if they are not technologically well equipped "…Education will be incomplete without tech. In order to go beyond the ordinary and achieve more effective learning, technology-supported campus should also be necessary" S17 mentioned. S2, however, stated "…Technology-driven workspaces in a learning environment provide us with

comfort, safety, and functionality." S7 added that, "The ceiling, walls, and floors in the classrooms should be equipped with networks suitable for computers and other technologies".

It was interesting to hear that most of the students demanded study spaces for individual and group work. Nevertheless, some students mentioned in investing more on a technology is better than constructing a building. Some students also assert that "… There may not be a campus based institutions in the future, technology or artificial learning will replace campus based education".

Besides interviews, informal and formal observations indicated that technology should not be integrated into teaching without careful consideration. On one hand, technology supports learning and meets the educational needs of students; on the other hand it causes students and teachers to become quite lazy. Observations also showed that the absence of technology, students become disinterested in the lesson.

Considering the contributions of technology positive in relation to prevent investing more onto campus building, some students mentioned the negative aspect of technology from an effective teaching and learning perspective. "…Teachers postpone or suspend the lesson in the absence of technology since they are heavily dependent on technological tools. Interestingly, using ready-made material can end up with inadequacy in teaching repertoire".

Although 21st century is considered as age of digitalization and information age, throughout the interviews it was surprising to see several students mentioned about the necessity that "…every educational building on our campus should be provided by computers, tablets or any other technological devices to access and use the information to make learning environment more effective. S7 explained that, "Each school should have an infrastructure that help technology combine with education. Therefore, a computer network must be installed and available in all buildings and a sufficient number of computers must be provided…" In addition, formal observations indicated that "Supposing there are enough

computers for all students. The real problem is not having sufficient number of computers, in fact lack of enough plugs to charge those become one of the main infrastructural problem".

Physical structure of the campus. Throughout the interviews it was frequently mentioned that the campus is not only an architectural structure. The common idea of eleven students was architectural structures need a texture that promotes opportunities for effective learning. Inclusion of a high level of technology, security measures, and large enough but comfortable buildings with plenty of green areas were main concerns. In addition, concentration of their opinions was onto the "demand and supply" relationship. Students commented:

S7 stated that:

Campuses are places that allow students to develop personality, give a sense of belongingness to a community, and encourage collaboration through learning. Moreover, the physical structure of campus has an impact on student behavior and learning. Students should feel happy and develop belongingness toward their institutions. I am not sure if the campus building, environment, and atmosphere have any effect on developing such attitude, but you spend years in this campus, and feel connected anyways.

Similarly, S3 pointed out: "…The physical structure of campus is very important in learning; because it makes a person feel comfortable and, therefore, creates concentration to all of our lesson". Also, S13 and S15 nearly indicated the similar opinions:

The physical appearance of a campus, its physical structure, the shape of the buildings is one of the most important factors in effective learning. Nobody would love to be in a place she or he does not like to be in. It [campus] should have aura and you should feel you are a part of it.

In support of the other students, S20 stated that: "In addition to the physical structure of the campus, size of the classrooms, lecture halls, and labs are considered very important in terms of creating a lucrative learning". S12 explains:

In a small classroom, there are many preventative factors from learning appropriately and, thus, there is little desire remains for learning. It is a necessity that the needs of the students should be taken into consideration as a base before designing the physical structure of a campus and other parts of the campus.

Moreover, S16, S17, S18, S20, and S24 pointed out several features in relation to design issues:

People have tendency to be in a place where they feel comfortable. For instance, spacious and bright places are more inviting. Being a student of a school that only composed of rectangular or square rooms may create boredom among many of us. Therefore, willingness and being an active learner in an environment that holds important characteristics of physical structure is inevitable for an effective campus life. What I believe is that the very important issue is making students happy and enforce them to be a member of a large learning community. This is possible by establishing learner friendly educational structures.

In summary, in accordance with interviews, observations, on the other hand, helped in developing an idea that it would be possible to derive a conclusive phrase "the better the physical structure of the school, the better the success in learning".

Campus Location and Access. Reaching to a campus without an extra effort is a demand for many participants. At this part of the study interviews mainly concentrated on location of the campus and access to campus facilities. One fifth of students mentioned that the campus is located uphill with a beautiful sea view, but the distance to reach to campus is somehow far. Lack of sufficient number of bus services, erratic time's schedule of local

transportation services and in-campus and off-campus ring services considered a major struggle for students. S17 mentioned:

It is of course pleasant to be in a beautiful place as a student, but in order for us to reach that beauty, we miserably spent hours on streets hitchhiking or waiting at bus stations [most of them shared very similar thoughts].

While others talked about location, scenery, and architectural esthetics, several students focused on time consuming issue and its direct effects on their school life. They also expressed their negative thoughts by suggesting that "Choosing the right place to build a campus is an important issue to be taken into consideration before constructing the campus buildings". However, S11, S14, S17, and S21 also mentioned:

Yet there is no chance to move campus or buildings to another better place, transportation, at least, can be organized in a better way to help students manage their time properly. Thus, time spent in reaching a campus would have been spent in learning or in a library.

Of the twenty-five, only 5 participants mentioned the importance of distance and location. While four of five students criticized the distance in a negative way, remaining student (S21) stated: "The campuses should be outside of the city. Because it allows students to be in touch with nature. In addition, being away from city noise provides a better focus on the lessons." The other four students' comments were as follows: S16 stated that, "Due to the location of the campus, transportation is exhausting. A tired student cannot concentrate on the lessons". And, S12 added that, "The campus should not be in an isolated area. It should be built in an area that is easily accessible". S19 shared the same opinion, "The campus should be easily accessible". Consequently, S6 expressed that:

Being in a campus far from where you live sometimes ends up with being late or even absent for lessons. When we are late to the classes, we face with difficulty in concentrating and even lose the important part of the classes.

Observations, on the other hand, cleared that the distance of a campus from on-campus dormitories, the number of students on the bus stations, and geographical location of the campus (campus is established on hills) matched with what students indicated during interviews.

Visual attractiveness of campus building. Review of interviews indicated another topic that the students focus on was visual attractiveness of campus building. One fifth of students explained that visuality of the campus buildings affects their learning in different ways. For example, S14 stated that, "The layout and visuality of the buildings (both interior and exterior) should be appropriate so that students may demonstrate positive attitude and belongingness toward campus".

Other student (S21) said that, "The visual architecture of the campus and buildings must be eye-catching with a lot of highly thought aesthetic features. This also helps students develop a notion of being a member of a campus and helps them to familiarize with the environment more easily". Another student (S20) commented as "The visual appearance of the campus may increase students' desire to be in school at all times. For example, buildings in the campuses should resemble a university like structures not a high school type".

S17 added that, "The design should enable students to be the effective users of a school building". And finally, S16 mentioned that, "University campuses are better if they are more colorful and active, rather than being traditional".

Harmony of building architecture. Although the main emphasize was on investigating whether campus buildings and surrounding environment fit with each other in a sound and integrative manner, most of the students assumed the question from their own

perspective which is mostly related with their needs from campus harmony. In their understanding campus harmony is reaching all necessary facilities in a way without spending much effort. S5 expressed and make suggestion for architects that:

> I think, in addition to student's readiness to learn, environmental factors directly affect the motivation of the student. For example, in most universities, students spend their time out of class, meet their food/ beverage needs and socializing with each other. For this reason, when preparing the appropriate environment, a plan should be made considering such basic needs.

S25 stated that, "In addition to the internal and external design of a campus, the facilities of the surrounding environment should be considered". Consequently, S9 pointed out that, "It is seen that physical environment conditions shape activities and effect the behaviors of students and employees".

Size of buildings and suitability for number of students. During the interviews, four students of twenty-five expressed that the size of the building is another important design consideration. They believed that size of the buildings should comfortably accommodate the large number of students. Furthermore, campus buildings should be large enough to permit various teaching and activities for great numbers of individuals.

S16 stated that "Functionality is more important than the size of the building". Similarly, S6 pointed out that, "It is important that campus buildings are useful rather than being large". In addition, S9 said that:

> The size of the buildings and especially the existing school buildings should be renovated according to the requirements of the contemporary approaches towards learning… [And] the new buildings should be carefully planned and designed based on modern approaches. When planning new school buildings, it would be appropriate to, first, get the opinions of the people who use the buildings, [especially the students].

Because people who use the buildings themselves can easily identify the deficiencies of the spaces and provide better alternatives to designers as well as educators.

Finally, S8 mentioned that, "If the size of the school is large, the campus area also expands. Therefore, students are more likely to come to school and spend more time in campus".

In addition, formal observations indicated that even though buildings accommodate large number of students comfortably, the services provided for students in those buildings lack or very limited in utilizing students' academic and personal needs. Campus buildings should be congregated for the purpose of meeting students' needs [educational and social] and must also offer students infrastructure for their personal demands.

Class size and activities. Size of the classes with regard to accommodation of great numbers of students and availability of permitting different learning activities in those classrooms or other related areas are important design issues to be carefully taken consideration. One fifth of students expressed their ideas regarding the size of the class, types of furnishings, and other design features by indicating the functionality as more important than those above features. Largeness of a class does not guarantee effective learning. However, small but more functional classroom may serve better learning opportunities. At first, S6 pointed out that:

Classes should be built according to learning outcomes, professional development, and the needs of a specific subject matter. Student capacity should be secondary other. In our country, quantity issues always come first and quality is somehow neglected. Classrooms are filled with students, one board, a lecturer and internet connection does not represent the features of 21st century university. If there are not enough classrooms, which we have experienced many times, the efficiency and the functionality of the lesson decreases due to the student population or lack of enough

number of classes. This situation also reduces the efficiency and reputation of that university. On a large scale, it effects learning negatively.

During interviews, S3 and S22 especially emphasized on the largeness of class and added the larger the size of the class, the more effective is. For example, S9 stated that, "It is seen that many physical environmental conditions such as class sizes, number of students in the classroom shape the educational activities as well as students' behaviors of students".

Also, S22: "The large and spacious classrooms prevent students from overwhelming during class hours, therefore, it helps students spend less effort and learn more".

Consequently, S3 and S5 mentioned that: "Factors such as having sufficient, bright, and spacious space for movement, being able to move the chairs during the activity, and being comfortable are among the main features of class size and its effectiveness".

Architecture in regard to departments. Campuses house many different schools and faculties from different area of concentrations such as medical, law, art and science, education and so forth. Among these schools there are also different departments under the roof of a specific school of faculty. Considering that there are many different higher education programs in the schools, the design of those buildings which hold specific features of a specific fields is very important factor. Because there are many differences among those departments in terms of goals, aims, learning outcomes, classroom practices and activities. Some of these courses are completely theoretical, while others are fully practical. Some departments are needed laboratories, but some departments require only musical instruments. Therefore, all of these details should be considered before the buildings are constructed. For this issue, students were asked whether the department they are in has some basic characteristics of the program they involve. Not only their own departments or schools but also campus architecture should support the needs of all students from different programs. S13 stated that:

The campus is where the student spends the most of the time during the day. Students must use this period of time in the most effective way. For example, needs of students differ in relation to their own areas of study. A student who pursues a degree in the Faculty of Agriculture may need a small land while another need a microscope.

In addition, similarly to above quotation S21 said that:

There should be all kinds of equipment and materials that can meet the goals of a department. For example, if there is a chemistry department on that campus, there must be absolutely a laboratory…Thus, students can improve themselves in their own fields and complete their education successfully and in a much healthier condition.

In respect to what have been mentioned so far, during informal talks with students from different departments, an important point arouses regarding constructing the department or faculty specific architectural structures or buildings. S1 interestingly mentioned that "When you look at the building from a distance, you should be able to tell what faculty or departments belongs to that building. For instance, Art school may have different view than agricultural school".

Usability of building for disabilities. During talks with students, important point emphasized was efficiency of campus facilities for students with disabilities. Most students mentioned that campus buildings should enable easy access for disabilities and provide moving equipment and tool. S17 expressed that:

With its existing infrastructure and effectiveness for disabled students, campus renovation must be considered to fulfill demands of those. Not only campus but also classrooms and buildings should be constructed or renovated in a way that will ease the life of disabled students. Those students may feel more involved to the school community if they are provided similar opportunities with others.

In addition to interviews, informal and formal observations were parallel with what students mentioned during interviews. An effective campus must carry the features of important components that were necessary to make campus learning friendly for all individuals. However, it was noted that the campus does not provide very basic things such as pedestrian walkways, ramps, transportation, elevators, wheelchair access route to buildings for disabled.

Libraries. Throughout the interviews, as expected, library was the most talked and considered the most important structure or building of a campus. Since this part of the findings were related about architectural and design perspectives, responses regarding the number of books or other sources were reduced and the main concentration deliberately spent on the other features of the library. Students generally mentioned that libraries should be attractive places. When students enter the library, they should feel encouraged to study. One student mentioned: "In order for students to feel welcomed, libraries should have different components because the architectural surroundings and the atmosphere of a library play a major contributor role in learning process. The reading area should be designed as pleasant as to convince individuals to study. To begin with, S6 stated that:

> There must be a library on campus. The student should obtain information from the most accurate source when it is necessary. The library is the second home of the student. Therefore, desks and chairs should be comfortable and healthy. Also, a suitable environment should be provided for studying.

Next, S21 pointed out that:

> The layout and design of the library should be in a motivating way so that the student can work and be more productive. Especially pertinent issue is that the library should not be complex, but in addition to academic needs it should also offer other things that the students may demand. For instance, sometimes we study late, we study hard, we

get tired, we get hungry but nothing is in our library, even a cup of tea. Eating, sleeping, speaking, talking on the phone, in short everything is forbidden. Especially night hours and weekends reaching to our library and going back to home or to dormitory is nightmare.

Also, S22 said that, "It should definitely be library in every campus. The library should be designed with technological tools so that the student can study, read and do research as desired." One student said that location of a library is also important. S21 stated that, "The location of the library should be in a good and easy to reach place".

However, another student (S1) explained her dissatisfaction by indicating, "The library was stuffy and smelled of dust, so I refrain from using it, so I go there just to take and return the books".

Security. During interviews, students emphasized the importance of security in campus. They thought that an educational environment should be the one that every student feels safe and campuses should be built and designed by considering security and most advanced way. Students generally gave the similar examples: "A student who feels safe can take advantage of what the campus offer. For example, the library is always open. Students can work there comfortably and efficiently because they know that they will not have a security problem". In addition, S8 stated that, "Places on campus should be designed safely". Besides S2 expressed that, "Officials must provide security personnel on campus". Lastly, S4 pointed out that, "Lack of adequate security on campus has a negative impact. No one needs to be nervous when going back to home or school at night".

Observations has been conducted during different times of the day regarding safety. Most of the time researcher's observation showed parallelism with what students mentioned. However, among many issues in relation to security, one of the most important observation was students' unawareness and negligence in case of a need for security. For instance,

students who was subject to observations showed attitude that they do not know how to approach to the security services. This may be because there is no satisfactory orientation in relation using security when needed.

Accommodating the needs of learners. This part of the chapter related with accommodation of learners' needs through considering features of physical environment provide information that was gathered throug interviews and observations. Data collected from participants related with diverse needs regarding how physical environment satisfies them. This part primarily focuses on personal and academic needs. Although it was very difficult to distinguish some needs whether they are an academic or a personal, some needs that students mention would go under both categories. Namely, canteen, sitting and recreational areas, dormitories natural elements (tree, flower, greenery, garden layout), sports, festival and exhibition areas, flexibility, stationery, market, hairdresser, refectory, cafeterias, collective activity areas, social areas would be placed under personal needs. Others such as laboratories, ventilation system, windows, air conditioner, acoustic/sound insulation, cleanliness, tools and equipment, technology utilization, smartboards, projection, computers, tablets, health units etc. would be under academic needs. Several of them would be placed in both categories such as internet service.

Personal Needs. In order for students to be successful in their academic life personal needs should be satisfied through the services that university provides. Especially in campus universities, students spend most of their time in campus facilities. These facilities sometimes serve as areas related with socialization and works as communal fields. For instance, canteen, sitting and recreational areas, and other communal areas may help students to develop themselves personally and academically.

When the interviewees were asked about the physical environment of a campus, four of the students stressed that to improve educational performance, *physical environment* of a

campus should support the needs of students. The closest place to be in the physical environment is *canteens*. Canteens are the areas where students can sit, rest in break times, socialize with other people. In addition, S22 stated that:

> Cafes, where students can spend time, should be opened late. The canteen should be large enough and designed entirely for the students' needs. They should not be designed as areas where students can only spend time to feed themselves. Also, canteens must include some additional recreational services as chess, backgammon and so forth.

Another student (S21) said that, "The fact that there is a sitting area outside the classroom where students can relax at the end of the lesson increases the students' motivation to work on their courses because it allows students to relieve all their fatigue". In addition, S25 commented as, "Near the campus; lack of social spaces and limited personal areas increases the importance of having on campus facilities". Besides cafeterias for meeting the needs of eating and drinking, half of the students mainly focused on the necessity of multiple refectory areas due to the distance of the refectory area. Almost all of the participants agreed that the meal services provided on campus facilities should be priced by considering student budget. S6 shared her/his opinion as:

> There must be a campus cafeteria or refectory on campus where students can eat twenty-four-seven and prices must be affordable. This helps us a bit financial relief. And, if the number of these service places increase, we can quickly between lesson and break time. Hungry student cannot concentrate.

In addition, S22 stated about the food quality, healthy eating, food choice, and the atmosphere of refectories:

> The cafeteria of the campus must be clean, fresh air needed. Meals should be prepared with what student's demand. A questionnaire, for example, would be given to us about

what we want. Vegans, vegetarians or other type of preferences should be considered. Also, cafeteria or refectory hours should be long enough so that the students can eat whenever they feel hungry. I believe, all of these have positive impacts onto students' personal life and help concentrate more on academic learning.

Another important factor mentioned during interviews were the necessity of green areas as one of the features that the campus learning environment should have. Student 22 and S6 commented:

It is necessary to build areas on campus where students can spend time and relax, especially between classes or during their free time. The most important of these areas are green areas. The student rests on the grass, feels free and be motivated to study and learn. The green areas prevent the campus from becoming a pile of concrete buildings. Having been in a natural or nature like places somehow creates psychological relief. I believe this may create a positive atmosphere for us to concentrate more on our academic works. In other words, such satisfying personal needs results with better academic performance.

Also, S20 stated that, "The large amount of green areas becomes a point of socializing for the students who are suffocated during the summer months". Other student (S3) said that, "It is important to have green areas on campuses because green areas give students comfort and energy during break time".

Observation notes and interviews indicated that students believed sports fields to utilize spare or break time are necessary architectural features of an effective learning environment S6 explained that:

The availability of sports fields (table tennis, basketball, volleyball) on the campus allows students to have different kinds of hobbies as well as their own education. It

can help students to avoid stress while supporting their interaction with the social environment.

Almost all students pointed out that the necessity of stationary, market, and hairdresser. They want these places to be inside the campus to save time. She (S14) explained that:

When I want to get an immediate printout between the break times, I don't want to leave the campus. Also, it would be easier to go to an existing hairdresser on campus instead of going down to the city center. It's too long to wait for the bus and turn back.

Another student indicated that "I cannot believe we do not have a market [other than a chain store], stationery, hairdresser, tailor so forth inside the campus that is necessary for our everyday life". S22 stated that:

It is interesting not to see a hairdresser in a campus that holds nearly twenty thousand students live. Officials should consider those basic needs in part of the physical environment of a vivid campus. Places should be built according to the needs of the students first, and then classrooms should be around the social centers. I mean in the center of the campus our personal needs and around the center our academic buildings, it is that easy."

Analysis of interview notes and observations indicated that most of the students emphasized the necessity of areas where they congregate for a specific purpose of activity. They stated that these activity areas enrich students learning. For example, S5 stated that, "The student will be more diligent if he sees that there are various activities and many opportunities are offered for him". Moreover, S4 expressed that, "Socially! Students should be able to find different activities organized under one big roof. Also, being together for different purposes improves our socialization as well as friendship".

Besides socialization and being a member or a part of a group, individual study areas are among the mostly mentioned issues. Throughout the interviews, many students pointed out the necessity of individual study areas. They commented the same opinions as:

Each student's method or habit of studying is different. In collective study areas like library, halls and classrooms, there are rules that we need to obey… we should always be quiet. But we need an individual study or work areas, cubical for example… I want to rehearse and need places to speak aloud while studying. Or a student may focus better when working alone. Students also need to be alone to listen themselves or rest since they spend most of their life in dormitories in a crowd. Therefore, individual study rooms or appropriate environments should be provided even to read a book.

Interviews underlined the fact that most of the participants are satisfied with the university's research hospital. However, some students mainly focused on the necessity of smaller units for basic health needs, instead of going to the hospital. Lack of pharmacy, in fact, was mostly mentioned issue since there is no pharmacy on campus. Students (S21 and S18) stated that:

While establishing a campus, all essential components should be considered in an effective way. It is a good thing to that university has its own hospital, but nearest pharmacy is far away from the hospital and prescription is good only for three days. I do not want to spend my time travelling around to get the pills and to see the doctor. I do not want to be late or absent by running around.

Academic Needs. In learning organizations, especially in campuses, there are varieties of individual needs. Therefore, the term 'need' attributes different meanings for different individuals. Previous part mentions personal needs and at this part of the study the main focus is on academic needs. Though there are many different definitions of academic needs, this study emphasizes academic needs mostly from an architectural perspective. In today's

campus environment it is somehow difficult to distinguish personal needs from academic ones since they are interrelated. Realizing both sorts of needs is essential for university students to as they pursue an academic career. As mentioned above, an architectural perspective of needs is area of concern for this part. This study is conducted in a qualitative manner. As literature frequently indicates that in most times the qualitative studies do not concentrate on generalizability but instead focus on specific issues, cases, phenomena, and etc. During data gathering process both informal and formal observations and interviews underlined the fact that participants commonly shared similar ideas in relation to their academic needs. Observation notes also showed that most of the responses gathered from participants focused on what has been missing. In addition, absence of specific tools, services, and even intellectual capacity would be considered as most frequently mentioned need issues. Furthermore, interviews showed that in most of the time even an existence of a specific tool or service etc. would have been considered as deficiency if those tools or services do not function properly.

Based on the interviews it has widely been deduced that academic needs may differentiate. For instance, some students pointed out the necessity of flexible chairs and tables. In addition, they all agreed on that their classrooms should be equipped with movable chairs, desk, and tables especially during learning activities. S5 stated that:

It is an important need to have comfortable and flexible tables, desks or chairs especially during the activities in the lesson and to be comfortable as we sit on those uncomfortable things hours and hours. I think that nobody thinks about where we sit.

Also, S18 pointed out that:

It will be more practical if the rows are moveable/flexible in classroom activities rather than being fixed on the floor. We are students but they make us sit on those church-like desks. If you do an activity in a group of four, it is impossible to sit face to

face. Faculty of education, for instance, is a new architectural beauty [with sarcasm] with desk rows screwed on floor.

Observations, on the other hand, visualized what has been mentioned during interviews in relation to flexibility in seating arrangement. It was obvious that school buildings –since education faculty has just been opened for education could be an example – would be built based on what learning theories suggest.

Another need students frequently mentioned is lack of storage areas. For instance, while interviewing, one student emphasized the requirement of the bookshelf in the classroom. S22 expressed that:

> Books, personal items, food etc. everything is in my bag. I feel like Ninja Turtle carrying my academic life on my back. There is a need to have storage areas or shelves or private spaces in campus buildings that would be assigned for us to get rid of these [she shows her bag] heavy luggage [she smiles].

Laboratories also named another important need by many students. Throughout the interviews students repeatedly mentioned the necessity of well-equipped laboratories in relation to their professional development. S1 expressed that:

> Along with theoretical knowledge, laboratories are inevitably important for us to comprehend what have been learnt. Even in social sciences, language education, pre-service teacher education students need well-established labs. Hard to imagine a student studying chemistry or civil engineering without a lab.

Interviews underlined the fact that having technical supplies, nice buildings, and well-equipped laboratories sometimes would not be enough. Of the twenty-five, more than half of students depicted an interesting issue. One of them explained that:

> Educational environments must be designed functional and should be learner friendly. It is nice to have a lab but we have a very bad ventilation system. Smelling chemicals,

breathing dust, an odor of different substances used in those places should be cleaned through effective filters. It is also tremendously important that students should be placed in a clean classroom which is free from hazardous particles or other unhealthy materials… A poorly ventilated campus lab will cause danger on human health. It will also decrease students' motivation if this effects their health negatively.

In addition to ventilation, one of students pointed out the necessity of enough numbers of windows for air circulation. S22 expressed that:

In our campus, buildings seem nice, painted colorfully, large corridors and hallways but classrooms, on the other hand, has just a couple of windows. Sometimes more than fifty students, more than two hours in the same classroom, imagine the air quality. I do not understand how they build schools without thinking this very simple air circulation issues.

Another student (S12) summarized the same topic:

Campus buildings always requires windows on the exterior and interior because air quality is important for students' achievement particularly when the buildings' heating, ventilating and air conditioning system is not operating adequately All windows in the buildings should be practical/functional so that they can be opened to provide air circulation when students need especially during long hour lessons. Also, classes should receive sunlight not to be dark and suffocating.

Similar to air circulation or ventilation, air conditioning was the other important concern throughout the interviews. Nearly half of the students shared common experiences about air conditioner. For instance, S1 shared that:

It is good to have an air conditioned campus buildings. But whenever we need to use it, we need to get the remote control from somewhere else [lack of remote control in

the room creates problems]. Should everything be controlled with a remote controller? I think it would be better to have manual control mechanisms.

Another student pointed out that:

Technology depended teaching and learning made us digital slaves. Neither instructors nor students can do anything without technology. Last week we had to postpone a class because of projector problem. Week before last week, another lesson was cancelled because we could not find the remote controller to turn on the projector.

These sorts of inefficiencies related with technological infrastructure but in fact cause negative impact on teaching and learning process. Observations after the interviews confirmed what have been mentioned during interviews with respect to ventilation, air condition, type of size of the windows, projector and remote control etc.

As mentioned before, it is somehow difficult to differentiate academic needs from other basic needs in campus life. However, during observations and interviews students provided information related with how basic or very advanced technological equipage have an impact on their learning process. Availability of tools and equipment related with their own subject matter was their primary concern in respect to their professional as well as vocational development. Most of the participants mentioned that the tools or other equipment are somehow outdated, in limited quantity, and out of order. When they need to learn to operate a specific tool or machine, they mostly observe their instructors instead of participating in hands-on activities.

Internet service, on the other hand, is another essential subject that students focused on in relation to its unstable signal processing, frequent shortages, low broadband issues and so forth. More than half of the students expressed common ideas about internet service. For instance, S22 said that: "Internet connection is unstable. For example, you are almost done

with the project or homework, suddenly you see no connection or poor connection. No downloading capacity. I think even 4.5 G is getting older".

They also mentioned that the availability of an internet connection in the classroom has several benefits for both teachers and students. For example, the teachers can enrich their lessons with different activities that they find on the internet. S22 stated that, "There must be an internet in every classroom. It is necessary because these factors enable students to study and learn more efficiently".

In addition to internet another forms of technologies were mentioned throughout the interviews. More than half of the students expressed the necessity of advanced technology including smartboards, projections, computers, and tablets. They believed that classes should be technology-driven places and the students should reach the information as soon as it is provided. They mainly focused on the smart boards because they think that smartboards are more efficient than traditional ones. Because it makes possible saving the information provided during lecture hours and reviewing those later. When technology is employed effectively, especially smartboards, the lesson becomes successful. The opinions of some of the students are as follows:

S22 stated that, "Classrooms should be equipped with technological tools such as smart boards that the teacher can use during the lessons. This makes the course more fluent. Thus, the student learns more easily". In addition, S18 pointed out that, "We should strive to achieve the best in using technology in education, and even encourage students of the relevant field to engage in scientific studies to develop technology".

In sum, students' main academic needs are concentrated on technology, infrastructure, and services related with using and maintaining those in campus. Campus environment is also considered from differed angles such as campus as a whole, buildings in the campus, classrooms in the buildings, and technology and services provided in classrooms. Either from

classroom or campus wide perspective students generally are not satisfied. For an external observer or evaluator, it would be hard to see the difference between the number of computers and the computers connected to internet. In other words, having adequate number of computers does not necessarily be determinant of having good internet surfing. Therefore, all structural substances in a campus life should work consistently. In most of the cases, students mentioned that all parts related with learning would have worked properly but unintended interruptions such as a bad air circulation or lack of internet service may degrade what have been in fact intended.

Findings related with campus milieu. Previous findings related with the first and second research questions primarily concern about characteristics of effective learning and the needs of participants in campus environment. Both questions were mainly focused on architectural perspective. For instance, for the first question effective learning environment and its feature was purposefully focused on architectural dimension. Similarly, the second question focused on the need of participants from physical and structural aspects. The main pattern was to explain the existing situation from an architectural perspective. At this part of the study the main emphasis was placed on the milieu of campus and how the campus be transformed into learner friendly organization. The term milieu can be used for different meanings. However, in this study milieu is considered as atmosphere or ambience of campus. Since educational organizations are not only an institution in which specialized knowledge or skills are gained, the milieu at the same time has responsibilities to prepare students for future and real life experiences. The criterion of milieu could be understood that learning and teaching experiences are closely related with the environment. Nevertheless, campuses in higher education are not places just to gain expertise in specific subject matter. In fact, campuses are vivid organisms that hold very different features of both school and everyday life. Students learn, eat, sleep, socialize, and spend most of their teenage years in campuses.

Therefore, it is important to establish well-structured campuses and transform existing campuses into a learner friendly environment.

Graduating from an institution that carries the features of effective school environment can help students to be successful at work, at home, and in their social relations and activities. One of the students clearly asserted that the place called campus is not only a green area, building, road, or garden. It has an aura. It has a pattern that people make it through interacting with that aura. It is also mutual understanding of common patterns. Transforming learning environment to a learner friendly campus should not be very difficult as long as residents share a vision. Instructors, students, administrators, even service providers can jointly act toward creating a better environment for learning. Surveys, for example, can be used to gather data regarding what is needed to establish a better campus. Administrators can talk with students to decide what and how to invest on campus. Local officials who provide financial support should be informed about the needs. What I have said so far seem to be apart from each other but in fact they all are correlated. If you invest money through gaining information about what the students' need or building a structure related with learning theories require an effective communication for establishing organization.

Findings related with campus transformation. In addition to what have mentioned so far at this last section the findings were discussed in relation to transforming campus to a learner friendly organization. There is a great need for many institutions to advance themselves consistent with the changes and views about teaching and learning. The field of educational science publishes numerous articles, guidelines and, reports regarding to improve student involvement in effective learning. Many of those articles refocused onto issues that changes in education uncovers a number of hidden facts about how learning occurs. For instance, some of those researches place emphasis on constructivism and its process and effects onto learning. Also, some focuses on the results of experimental studies in relation to

how motivational factors create intention to learn more. These types of studies could be elaborated with respect to very different subjects and contents. It would be necessary to delineate what does the campus transformation mean. Assuming that the campus was built in the last century. At the time the campus was established, approaching to education was totally different than today's educational expectations. For example, teaching strategies, technology, the way teachers were educated, jobs, science and so forth have been changed. In fact, the world is on evolution. Therefore, in order for educational institutions to survive in this evolutionary era, a type of reformation is essential. It means that not only pupil but also buildings and campuses should be revolutionized in accordance with today's and future's goals. This revolutionary process is a multi-dimensional effort. Once an organization is in a process of change, it faces a complicated endeavour. As mentioned earlier in this part of the study, architectural structure of a campus is one of the most important aspect of this change process. It would not be very difficult to reorganize the teaching staff. Also, a web page of a university could easily be transformed to other. However, hundred years old buildings would not be demolished and built again in a campus environment while education is in process. Therefore, this transformation process should be based on the discussion with the residents and careful observations. The main aim of this study, in fact, focuses on the discussions with the students regarding the transformation and their feelings, thoughts, and expectations in this manner. Also, researcher's observations mainly concentrated on whether students' demands and transformation efforts demonstrate consistency. For this purpose, following categories deducted from interview records and observation logs.

Technological Transformation. At the beginning of this study, departure point was architectural issues in relation to campus structure. The facilities of campus and their usefulness was an important consideration for the researcher. First, it was aimed that exploring existing architectural would be beneficial for readers in understanding the

correlation between structural patterns and effective learning. However, it has been found that architectural structure cannot be optimized for effective learning by itself. Along with architecture, technology has been optimal configuration to ensure the architectural logistics. In other words, architecture should be a base for technological evolution. During interviews, students generally explain that the technological infrastructure should be able to supply everything for students' success. S5 explicitly stated that:

> We are in a decade of electronic mutation. We use the very same technological tools people were using ten or twenty years ago, it means that we are in an age of technology mutation. Everything we use in our education is evolving swiftly. The question is whether we are follower of this swift change. In our lessons, we use different technological tools for different purposes. However, as the years past innovation in technology continues and our tools in our classes should adapt to this innovative approach.

> Another student (S7) mentioned that "It is a difficult question for me. How could a campus transfer itself towards technological advancements? Is it the number of computers or the size of the computer labs? When I think about technology I only imagine computers or tablets". S13 delineated the thoughts of S7 by adding that:

> People think that technology is limited to computers. In fact, chalk, black boards, smart boards, and projectors are all technological things we have used and we are still using. When I think about transformation of a learner friendly campus from a technological perspective, I mostly think about digitalization. I mean we should use technology when we enter the classrooms or dormitories, we should be able to see which buses at what time is going to be in our bus station next to faculty building through my smartphone.

During focus group interviews, S12, S16, S23, and S2 mentioned that technological transformation should have multiple dimensions. They focused on transformation aspect as learning, living, entertainment, leisure etc. They provided several examples regarding the aspects. For example, common sense about teaching is 'lecturing'. They say:

During lecturing we should be present in class because instructors are taking attendance. Moreover, in one lecture sometimes hundreds of students placed in amphitheater-like halls. Now, I understand what you mean by technological transformation: the lectures could be recorded and we could see and learn the topic via our technologic tools like cellphone. Therefore, no attendance, no rush to catch the lecture.

Focus group talks underlined the fact that students consider technological transformation from a distance education perspective. Campus buildings would house many students. However, students prefer not to be seated, but free through technology. In addition, technological transformation of a campus may be considered as 'digital' or 'electronic' campus. In contrast with what have mentioned above S17 said that:

We even do not have money to buy books, are you talking about laptops. When there is an electric cut, we cancel the lectures. Instructors or students have no printed materials. I totally disagree with technological dependency. I am not saying that technology is bad, but we should be able to do the things without depending on technology so much. You can search how to cook from google, but in the kitchen you are the cook not the google. Do you know what I mean?.

Based on the information gathered through interviews it could be concluded that students have very interesting and creative ideas in relation to technological transformation. Some mentioned infrastructure, technological services such as an internet, edurom, quality of computers in labs, availability of software, and so forth while others considered

transformation from a digitalization or electrification perspective. Although their thoughts and understandings differ about transformation, most of them agree that there is a great need to transfer existing situation of the campus toward the better one.

Architectural Transformation. During interviews students were asked about how to transform the campus to a better one. They were also asked to think about this from an architectural point of view. It was interesting that they had a great difficulty to explicate their thoughts. It is somehow difficult for a person to envision to transfer the existing pattern of a phenomenon to another one. When they were asked about how campus would be a better place for them, they mostly talked about their needs and expectations. They generally struggled in changing the campus environment to a learner friendly organization. Their responses mostly concentrated on campus, environment, learner, friendly, and organization. Their thoughts were not holistic but segregated. Every concept was mentioned in itself. There was a difficulty to convey students think about transformational processes from a holistic point of view. For example, S21 "If the classroom is small, there would be little desire to learn because of the rotation of the breath inside. The size of windows is a major factor in learning". Also, S20 said that, "The refectory must be in a separate building. It's not nice to smell food in class. It is distracting". S6 mentioned that "The cleanliness of the classes is effective in the participation of the students. Cleanliness reduces attention-deficit of the students. In an unclean classroom, the attention of the student changes from lesson to garbage, which causes him to fail to focus". In addition, S1 pointed out that "I didn't have any problems with the cleanliness (except the washbasins). There was no soap and napkin in the sinks. And the flush and doors were out of order. All of these situations affected my view of school negatively". S6 shared her/his experiences that:

Classes should be suitable for teaching in terms of temperature. In a cold classroom environment, student participation will decrease as the students feel cold. If we go

further, as a result of this, the student and teacher will be ill and there will be interruptions in the lesson and students will have problems in understanding the course.

In addition, S23 stated that:

In the classroom, neither hot nor cold air is required. It should be moderate. Moisture should be kept constantly low during the lesson. The ideal transformation should be done to avoid distraction and comfort, otherwise, students may be adversely affected by heat.

Consequently, S11 explained that, "I think the temperature of the classroom affects learning a lot. It's not very nice to listen to the lesson with coat".

During the interviews, the other important subject that transformation needed is about layout and maintenance of the campus buildings and classrooms. One fifth of students pointed out that their opinions as follow, S25 expressed that "No matter whether the interior or exterior of the campus, there should be the transformation in each place. The tidier the area is, the better social life and educational success have the students. The transformation of the places may effect learning skills positively. In addition, S21 stated that, "The layout of the class or the amphitheater in which the lesson is taught needed to be organized in a better format such as seeing the board or hearing the instructor clearly".

On the contrary, S7 pointed out that "In neglected buildings, for example, with broken toilets, insufficient ventilation, and poor lighting, students' motivation will decrease, and they will be affected negatively. If they [administration] want to transform something, they should start from physiological angle". Three of the students (S2, S5, and S16) also proposed the similar opinions that air quality is one of the most important elements that affect students' achievement positive or negatively. They also stated that when the oxygen goes to the brain, the brain is refreshed. It strengthens students' motivation and sense of wellbeing.

Interviews with twenty-five students underlined the fact that transforming the campus may cause positive and negative effects. For instance, S19 stated that:

The buildings have significant positive and negative impact on learning. In some faculties --since different departments use the same buildings-- there is a lot of noise. For example, there are music lessons in the preschool department. In a next door we have a theoretical lecture. We develop theories with music [smiles]. Transforming efforts should consider these problematic issues.

Interestingly students talked about transformation of a campus from a perspective of a 'color.' They mentioned that colorless buildings are more suitable for campus scene. Buildings' appearance must have harmony with their surroundings. They also must resemble inspirational features to make students feel positive about their institution. One of the students (S21) explained that, "Colors produce different physiological responses. For example, dark colors should not be preferred. Because, dark colors can reduce students' energy and affect their psychology in a negative way". In addition, S24 stated that, "The color tones should harmonize with each other. Distracting colors, designs and objects should be avoided". Consequently, S22 said that, "Color should be chosen which is not depressing". During the interviews, seven out of twenty-five students stated their ideas about the transformation in relation to lighting. They mentioned that "The classroom environment filled with daylight would likely be more stimulating. Also, lighting in the classrooms must focus on over the students' desks". However, some of the students talked about the positive impact of light on students. Natural elements of a campus architecture such as trees, flowers, and greeneries etc. were another consideration regarding transformation of campus environment since they spend most of their time through benefiting from campus facilities. Among all, the natural areas were considered as important toward transformation. For example, S23 pointed out that:

I think the green areas are one of the most important places because students can find peace in nature. In a concrete city center, we can see that people are unhappy. In addition, green areas can change students' view of life and campus. There are peace and happiness in a university with plenty of green areas. However, green areas by themselves cannot be enough. There need to be facilities inside of the green areas or campus forest. There should be places for students to meet with each other and exchange ideas.

Also, S11 expressed that, "I think that green areas also have a relaxing and refreshing effect. But we are not there to eat grass, we need a little facility to rest and socialize".

Throughout the interviews, students mainly focused on that campus buildings should be considered more than structures. They stated that if campus is in a harmony with the environment, especially with the nature, encourage socializing, providing healthy, secure and stimulating environment, we can call it learning or learner-friendly organization.

Some of other students suggested that weekly or monthly sports events or festivals can be arranged. These activities should be organized according to the faculty. For example, discussion competitions for the faculty of education; various sports competitions can be organized for the faculty of sports sciences. Other students focused on technology and said that by using technology and making it available to the student, social activities can be increased and students can be involved. To sum up, a campus can transform itself by recognizing the deficiencies over time.

In conclusion, it was assumed that students focused the transformation process from parts to whole approach. In other words, they think that transformation can be conducted with bits and pieces. They believe that solving very basic problems step by step will end up with a holistic solution about transformation. It can also be said that participants were aware of the

problems and the needs, but as it comes to provide alternatives or solutions to those, their suggestions are somehow insufficient.

Chapter Four: Major Results, Conclusions, and Recommendations

This chapter provides a summary of the study, major findings from the study, conclusions, and recommendations.

Summary

While a great deal of attention has been given to architectural structure of educational buildings, less attention has been given to investigate the impact of these buildings' effects on students' learning experiences. In order to provide an effective learning opportunity to college students, architectural standpoint needed to be analyzed from students' perspective. Too often, students at college are users of what is provided for them. These provided things are goods, tools, or services and would have sometimes been related with the quality of food or speed of internet or comfort of cafes. Campus environment, on the other hand, is a place that houses almost every social and academic activity for a typical college student. Whatever the provided tool or service, most of them are presented to users in a campus environment. This study is a bit complicated to comprehend, for example, the relatedness of the quality of food and the quality of refectory. Another example would be number of computers for student use and the quality of internet services or software loaded to those computers. Or else, frequency of bus services from or to campus and the distance of those bus stations to dormitory building. Nonetheless, campus environment and all things provided for students are somehow related to effective learning. Most importantly, it could briefly be delineated with an example of eating concept. Even if the food has very high quality, but the lunchroom is not hygienic enough, it does not matter the price of a food is affordable or not, student develop negative attitudes toward eating or choosing on campus services to eat. In addition, if there are no alternative places for students to feed themselves, unhappiness should be taken into consideration. In other words, this is a kind of chain-reaction or dilemma or devaluation

of food quality because of low hygienic environment. Moreover, there would be very nice building around the campus, but no one wants to be seated in an unventilated classroom.

To be more specific, this sort of demand-supply relation from an architectural perspective in a campus environment has been considered worth to study.

Therefore, purpose of the study is to:

1. explore the interaction among architectural features of campus and students' experiences with these in relation to their learning,

2. explain the linkages among particular parts of a campus structures that are relevant to students' learning experiences,

3. provide suggestions about merging aspects of physical environment and contemporary learning practices for current and future applications.

For that purpose, following one main research question and related three sub questions were subject to consideration.

In what ways do physical *texture* of a campus construct an effect on learning experiences at a higher education level?

Sub-questions elaborates this one major question:

Sub Questions:

1. What are some major characteristics of effective learning environments from an architectural perspective?

2. How physical environment of a campus should accommodate the needs of learners?

3. In what ways could campus milieu be transformed into a learning or learner-friendly organization?

Students who are currently enrolled in the Çanakkale Onsekiz Mart University programs, officials, and area experts selected were primary participants of this study. Observation logs and interview questions were developed based on a review of the literature,

the initial observations of a field experiment, and open-ended questionnaires. Twenty five students, 5 officials, and one expert from university were interviewed and documents including manuals, books, manuscripts, reports were examined and analyzed. Data gathered through interviews were audio recorded, transcribed, coded, and analyzed in order to answer research questions. By analyzing the data, findings related to architectural features and learning were identified, verified, and reported.

Major Results

The following major results were developed from the data analysis:

Awareness of students about architecture and learning. Based on the data gathered from participants show that students somehow are not aware of the relationship between architectural features of campus and its interconnectedness to learning. In other words, participants assume the campus architecture and effective learning separately. They either concentrate on physical aspects provided for them or the learning opportunities to study their own field. It could be concluded that buildings and areas inside the buildings are considered separately. For example, most of those students have struggle to unite physical environment and effective learning. When effective learning is area of concern, they generally have a tendency to think of quality of instructor or instructional methods.

They, of course, have numerous things to mention about architectural features such as paint color, classroom size, green areas, buildings, and other observable characteristics of campus, but have limited comprehension if these features have any effect on their learning. Not only students, but other participants seem to demonstrate similar understandings. However, literature generously presents numerous studies related with impact on architectural features and effective learning. In fact, there are articles urge educators to be in a position of directing the educational building establishment process. At this part it can be concluded that the finding of this study underlined the fact that establishing a campus and constructing a

building is not a contractor job alone, instead the results of researches in relation to architectural dimensions of an educational institution and effective learning should carefully be taken in to consideration. Results show similarities with the study Lowe conducted in 1990. The study was about relationship between learning environment and physical conditions in Texas. Data gathered from participants was regarding the effect the building condition on their performance. Poor condition of the facility creates negative impact onto the learning climate. In contrast, in good conditions building had a positive impact onto the learning environment. The size of a building, environmental atmosphere, and instructional areas were considered as creating a positive effect upon learning climate. Also, Corcoran, Walker, and White (1988) stated that the physical environment was important, and lack of proper maintenance or repair would make working and learning individuals less successful.

Dawson & Parker (1998) conducted a study regarding the feelings of instructors about the buildings. Their responses were negative, but after a renovation they had positive feelings about their profession. The faculty responses were positive about changes and improvements regarding the physical environment.

In accordance with what literature mentioned and the findings of this study, the result for this part can be jointed under the idea that poor conditions have negative impact on effective learning. However, individuals need to be aware of the poor condition, work efficiently to ameliorate the condition instead of natural adaptation.

Infrastructure: Demanding personal and academic. Students' demands about campus infrastructure demonstrated similar characteristics. In general, both academic and personal needs were concentrated around campus infrastructure. To explore the needs and the sufficiency of infrastructure to meet the needs information gathered through observations, then interviews were conducted. It was an interesting to observe that all of what literature has been mentioned in relation to learner needs somehow met. Campus environment has an

enough capacity to meet nearly all that a student or an instructor demand. The findings underlined the important facts about having a capacity, but not fulfilling the needs properly. In other words, whatever the students demand, campus provide all. Nevertheless, the main problem is not related with having a capacity. Responses were mostly about inadequateness. That is to say, library, for instance, has one of the largest collection in the country, but air condition, heat, absence of rest areas, lack of food places near the library, security problems during after hours, absence of appropriate transportation from-to campus, comfort of chairs, sanitation, elevator, lavatories, and so on many subcategories of library usage is considered to be problematic. Else more, similar things have been mentioned regarding classrooms such as poor ventilation, lighting, distance of boards, inoperative smartboards and projectors, floor-bolted chairs or desks, dust and other similar absences were considered to be negative issues. Although these issues were considered to be negative, most students considered these normal and did not mentioned valuable information regarding their effects for learning.

Examples could be elaborated more, but the main idea here is the one that having a capacity and ensuring the performance of infrastructural capacity at a high level are not the same. At this point, capacity of infrastructural maintenance has become area of concern.

Studies similar to this study exist in the literature. For example, the importance of thermal condition and its effect on students' performance were a subject of many researches. Earthman (2002) shows that this issue has historically been searched in the literature by stating:

Good thermal environment of a classroom is very important to efficient student performance. Various researchers have provided a long history of research on thermal conditions in the business and industrial workplace. McGuffey (1982) lists such researchers as Vernon, Bedford, and Warner (1927), Osborne and Vernon (1922), McConnell and Yaglou (1926), Mackworth (1926), Winslow and Herrington (1949),

Herrington (1952), and Karpovich (1959). The conclusion of these researchers was that increases in temperatures in the workplace tends to decrease worker efficiency and increases the risk of work related accidents. As a result, proper control of the thermal environment is needed in the workplace. (p.3)

As it can be seen from above quotation that environmental issues have been a consideration even in 1900's. Earthman continues with elaborating:

These studies have provided some of the motivation for research efforts on the influence the thermal quality of the classroom has upon students. Specific research studies cited by McGuffey (1982) regarding the influence the thermal quality of the classroom has upon students have been completed by Mayo (1955), Nolan (1960), Peccolo (1962), Stuart and Curtis (1964), McCardle (1966), Harner (1974). Lemasters (1997) also cited Chan (1980). In almost all of these studies, the importance of a controlled thermal environment was stressed as necessary for satisfactory student performance. (p.3)

Harner (1974) concluded based upon an analysis of existing research that temperatures above 74°F adversely affected reading and mathematics skills. A significant reduction in reading speed and comprehension occurred between 73.4º F and 80.6º F. According to his analysis, the ideal temperature range for effective learning in reading and mathematics is between 68º and 74º F. Lanham (1999) reported that "After the socioeconomic status of the students, the most influential building condition variable that influenced student achievement was air conditioning." (p.3)

Although these studies are not directly related to higher education, it was worth to be mentioned here to underline that similar issues are considered to be problematic at different levels of schooling and elsewhere in the World. It would be important to mention them here to help officials to start taking appropriate decisions.

Need for taking action and campus transformation. The data indicated that students' presence in campus contributed a great deal of professional and social development opportunities. Almost all of the participants mentioned about the interactions, especially in class and out of class, and the importance of this interaction in enabling them to become more effective in their learning. They have mentioned that campus environment is necessary aspects towards personal and academic improvement.

During the informal talks or focus group interviews, most of the students indicated that they developed perspectives in relation to what to ask (demand) from other individuals and, in many instances, they mentioned the importance of understanding the opportunities campus provides.

Most of the students stated that their understandings shifted. They mentioned that discussions about the campus provides improved them to comprehend the features of campus to be more organized in requesting their demands to be fulfilled. That is to say, students seemed to be more acquiescent even no or faulty services, goods, or materials provided to them. Furthermore, by understanding to act in a more organized way, students developed a notion to able to assist administration for initiating a transformation toward student friendly environment to a greater extent and concentrate on specific aspects of their own learning.

Even though student were less experienced in campus management, their enthusiasm for replacing traditional campus settings with intellectual learning environments provided advantages so that students could engage in groups or teams. Students also gained insights from developing group arrangements for different situations.

Through observations of student interaction, researchers were able to analyze interaction patterns among campus, students, and environment and found improvements seeing the importance of campus transformation.

Another finding was that when students struggled in some learning assignments due to lack of services provided, they said that they used to force themselves to adapt to the situation. During the data gathering process they indicated that they are now somehow enlightened to explain and demonstrate causes of problems and some of the alternative ways of addressing those problems in campus environment.

Along with efforts to campus transformation, some participants delineated the transformation to be in a more global approach. They tend to focus the transformation issue as mental transformation instead of physical. Their approach to the change process is about changing the administrative perspective. Their belief is changing the direction from spending time and effort to these small particles --like ventilation of classrooms or fixing door handles etc.-- toward how to make university compete better in an international market and how the campus be organized for this approach. Similar considerations exist in the literature. For instance, Segall & Freedman (2007) quoted from Dr. Michael Crow's speech:

> "A New American University" as the centerpiece of a transformational effort aimed squarely at re-focusing ASU's goals and strategies. Part of the transformation means that, while still offering courses and programs in traditional disciplines, ASU is morphing into an institution balanced by modern programs aimed at solving real-world research issues that meet the current needs of Arizona, as well as providing the best education to the broadest population globally. (p. 6)

Participants' demands about making their campus more learner friendly and globally challenging institution also find answers in the literature. While building a well-organized campus is important as Reagan Ramsower stated:

> We have an ambitious campus master plan to build more dormitories and colleges. Our goal is to integrate and enrich the student living and learning experience to improve the overall quality of the undergraduate experience. We are moving to reduce

the student-to-faculty ratio and to create environments in which students and faculty
will socialize and spend more time together, [VP for Finance and Administration,
Baylor University]. (p. 9)

On the other hand it is important to draw an appropriate direction to the campus as Dr. Crow
mentions:

…Solutions that require the entire campus to come together in a reinvention process
guided by a clear vision and strategic planning. ASU's New American University
initiative is a perfect example of how a very large institution can reinvent itself. In
addition to proclaiming that it does not measure itself by the academic credentials of
its incoming freshmen, the New American University is one "whose researchers, while
pursuing their scholarly interests, also consider the public good; one whose students,
faculty and staff transcend the concept of community service to accept responsibility
for the economic, social, cultural and environmental vitality of the communities they
serve. (in Segal and Freedman, 2007, p. 11)

Consequently, findings of this study helped the researcher to understand the results
from a transformation perspective of a campus as to be a retrospective and consider the
officials administrative duty in campus administration as setting targets towards reinvention
of a campus.

Conclusions

Based on the data gathered through observations, interviews, documents, and
questionnaire, the following conclusions have been made:

1. Data from this study indicated that the nature of architectural structure has partial
impact onto effective learning if opportunities provided by considering college students'
needs.

2. Students became more responsive to courses in a constructive manner when campus life fulfills their academic demands.

3. Even though students demonstrated enthusiasm and commitment to the learning, architectural aspects somehow shaped the quality of instructional practices such as allowing application of different models of teaching for different subject matters, availability of indoor and outdoor resources, seating arrangements, size of classrooms, and quality of educational environment.

4. Focus on improving the quality of learning atmosphere through interviews helped students to understand their exact needs to be more successful in their school life. Also, students responded that they gained awareness in requesting their needs to be met by administration and developed ability to explicate the rationale for their demands. Interaction with students through focus group interviews helped them to communicate effectively regarding their expectations and to be more receptive of learning from what campus provides for them.

5. It was noted that students became the liaison to provide information to management between campus architecture and instructional needs for improving teaching.

6. Since participants of this study gained awareness about different models of teaching-learning and learning environment at the university level, they were more capable of communicating and reflecting about each other's needs.

7. Interacting with student prompted students to become more conscious about their needs they already knew and helped them to come to the realization that campus life was a valuable personal and professional resource.

8. By seeing other individuals' complaints and suggestions, participants indicated that they come to appreciate others' ideas and became excited about trying or providing alternatives for improving campus life.

9. Findings underlined the necessities in establishing learner friendly campus from different perspectives such as structural, technological, social, and personal. Individuals' personal thoughts for their own professional development became a subject for criticism and comments.

10. Despite the uniformity of ideas about campus life as well as architectural structure in relation to weaknesses of campus and demands of individuals, educational ground of a campus architecture did play a compelling role in the transition between university sources to learning friendly experience.

Recommendations

Based on the findings and the conclusions, the following recommendations are offered for practitioners and/or university directors:

1. Selection of campus place is important. Decision makers should not totally rely on architectural choices but should consider the educators' recommendations as valuable sources for choosing the appropriate place for overall success.

2. The development of a higher education institution requires commitment, dedication, and patience. Leaders of education who initiate commitment to professional development of a nation through establishing a higher education institution, should consider educational success from multiple perspectives or at least consider what others from different scientific disciplines have to say.

3. In many instances, there is a clear distinction between the knowledge and the actual practice of knowledge about teaching. Campuses with all of their surroundings should be the actual practice of knowledge. Architects may have a broad knowledge in their own subject matter but their practices in transferring their knowledge are often limited to their area of expertise. Thus, many campus buildings do not share the specific features of effective learning. Architecturally inherited ideas would not guarantee educational success. Campuses

engaging in different personal needs should represent models for effective learning and teaching. If educators want to provide students with an opportunity to experience effective teaching practices, decision makers and architects should be encouraged and invited to university methods courses to observe and be familiar with all aspects of the learning-teaching program as well as models of teaching and learning.

4. Higher education administrators should make joint visits to classrooms before making decisions regarding architectural features of a campus.

5. Unquestionably, the primary intention would be building esthetically appropriate structural campus platform to educate student to be effective people of future. However, decision makers should consider long-term goals for maintaining campuses for educative purposes by emphasizing professional development through well-established structural development so that every individual who become a part of campus life mutually benefits in terms of professional development.

Recommendations for further research are:

1. Descriptive studies are needed about effectiveness of learning practices in campus environment that emphasize developing campus life to serve better for students' needs.

2. Comparative studies are needed to explore how campuses differ from each other or show resemblance in relation to effective learning and learner friendliness.

3. An extension of the study to examine the impact of architecture onto learning experiences would allow a more complete description of how students learn from environment other than course of studies.

4. A follow-up studies of the students' interaction with different environmental components of campus would provide rich information about the effects of each campus component—such as library usage—in helping students' academic development.

5. Additional studies would be needed to determine the impact of the students' experiences with their personal development who have experienced campus life and who are not.

6. Additional research to explore the relationship between students' course grades and success in the campus and to find out how the campus life helped transferring knowledge into practice would allow comparisons. For instance, do students with higher grades benefit more from the learning opportunities that campus provides or vice versa? Do students with higher grades develop tendency to be better consumer of a campus life than their classmates who have lower GPAs?

7. How do personality factors affect students' ability to benefit from campus life?

8. Comparative studies are needed to explore the process of effective learning and impact of campus structure at other campuses of ÇOMÜ, such as Biga, Çan, Ezine, Lapseki, and others.

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Appendices

Appendix A

Inclusive School Building Assessment Checklist

The school building assessment checklist focuses on eight key characteristics **– building setting, information legibility, comfort, safety, wayfinding, communication, social engagement, versatility, and imageability.** On each item below, rate your satisfaction with the overall quality of the school building where:

VU=Very U=Unsatisfactory **SU**=Somewhat **N**=Neither **SS**=Somewhat **S**=Satisfactory **VS**=Very
Unsatisfactory   Unsatisfactory   Satisfactory   Unsatisfactory

Factor 1 - Building Setting: *The building setting influences the ease with which people move around in the environment.*

	VU	U	SU	N	SS	S	VS
1. Are there accessible walkways that connect the building to surrounding streets and buildings?	☐	☐	☐	☐	☐	☐	☐
2. Are walkways, bus circulation, car circulation, service delivery and parking physically separated?	☐	☐	☐	☐	☐	☐	☐
3. Is there sufficient room for vehicles to drop off and pick up students and other vehicles to drive through?	☐	☐	☐	☐	☐	☐	☐
4. Do boarding areas at bus stops offer accessible walkways leading to the building?	☐	☐	☐	☐	☐	☐	☐
5. Are walkways from drop-off points accessible to people with disabilities during bad weather?	☐	☐	☐	☐	☐	☐	☐
6. Are there sheltered places to sit at transportation areas for people of different sizes and with different physical abilities?	☐	☐	☐	☐	☐	☐	☐
7. Are there places where students can rest along walkways?	☐	☐	☐	☐	☐	☐	☐

Factor 2 – Information Legibility: *Signs, shapes and materials influence how well people understand their environment.*

	VU	U	SU	N	SS	S	VS
1. Are building entrances visible from all drop-off areas?	☐	☐	☐	☐	☐	☐	☐
2. Is the main entrance easily identified?	☐	☐	☐	☐	☐	☐	☐
3. How easy is it to recognize interior functions (such as administration, recreation, classrooms etc.) from the outside of the building?	☐	☐	☐	☐	☐	☐	☐
4. Are people able to move through entrances and exits without difficulty?	☐	☐	☐	☐	☐	☐	☐
5. Are routes between buildings designed so students have enough time to get from one class to another?	☐	☐	☐	☐	☐	☐	☐
6. Once inside the building how easy is it to differentiate public spaces from private spaces?	☐	☐	☐	☐	☐	☐	☐
7. Are there multiple types of signs (tactile and visual) and route markers to help students find their destinations?	☐	☐	☐	☐	☐	☐	☐
8. Do route surface textures change to indicate entrances or intersections?	☐	☐	☐	☐	☐	☐	☐

Factor 3 – Comfort: *The environmental conditions affect people's comfort.*

	VU	U	SU	N	SS	S	VS
1. Are temperatures in the learning spaces comfortable year round?.....	☐	☐	☐	☐	☐	☐	☐
2. Can temperature controls be adjusted in individual learning spaces?	☐	☐	☐	☐	☐	☐	☐
3. Is the light level in the learning spaces sufficient for reading without being overly bright or glaring?................................	☐	☐	☐	☐	☐	☐	☐
4. Do students experience eye fatigue at the end of the day?................	☐	☐	☐	☐	☐	☐	☐
5. Do students find the noise level in a typical learning space distracting?...	☐	☐	☐	☐	☐	☐	☐
6. Does the building allow for ample fresh, clean air (no vehicle exhaust, lab fumes, chemical irritants or other contaminants)?..........	☐	☐	☐	☐	☐	☐	☐
7. Do students notice a "new smell" in any areas of the school?..........	☐	☐	☐	☐	☐	☐	☐
8. Do students experience symptoms such as watery eyes, headache or nausea that go away after leaving a specific area or building?........	☐	☐	☐	☐	☐	☐	☐
9. Do students experience symptoms such as headache, nausea, or difficulty breathing immediately after a space has been cleaned?......	☐	☐	☐	☐	☐	☐	☐
10. Do students experience symptoms such as coughing or difficulty breathing in carpeted areas?..	☐	☐	☐	☐	☐	☐	☐

Factor 4 – Safety: *The building features that ensure the safety needs of people.*

	VU	U	SU	N	SS	S	VS
1. Is the building equipped so that people with varying abilities can recognize an emergency?...	☐	☐	☐	☐	☐	☐	☐
2. Do all warning signals provide visual as well as audible cues?..........	☐	☐	☐	☐	☐	☐	☐
3. In the event of an emergency are there available means of exiting the building quickly?...	☐	☐	☐	☐	☐	☐	☐
4. In an emergency are there areas of safe haven where assistance can be called if needed?...	☐	☐	☐	☐	☐	☐	☐
5. Are floor surfaces safe for people with mobility impairments?...........	☐	☐	☐	☐	☐	☐	☐
6. Do students with mobility problems or in wheelchairs easily traverse playground surfaces?...	☐	☐	☐	☐	☐	☐	☐
7. Does the interaction between lighting, flooring and other surfaces avoid glare?..	☐	☐	☐	☐	☐	☐	☐
8. Are people with visual and auditory disabilities adequately protected from hazardous areas?...	☐	☐	☐	☐	☐	☐	☐
9. Do stairwells and stair treads offer safe passage for people with visual impairments?...	☐	☐	☐	☐	☐	☐	☐

Factor 5 – Wayfinding: *The ability for students, teachers, staff and visitors to recognize routes, traffic patterns or passageways in and around the building.*

	VU	U	SU	N	SS	S	VS
1. Are sufficient routes provided to and around the building?................	☐	☐	☐	☐	☐	☐	☐
2. Upon entering the building can visitors clearly understand where to go for information?..	☐	☐	☐	☐	☐	☐	☐

3. Are all the circulation routes within the building clearly marked and easily understood?... ☐ ☐ ☐ ☐ ☐ ☐ ☐

4. Do the directional signs use colors, shapes, raised letters, or Braille so that people with visual impairments can find their way around the building?... ☐ ☐ ☐ ☐ ☐ ☐ ☐

5. Do signs use the same colors, symbols, and shapes consistently throughout the school?.. ☐ ☐ ☐ ☐ ☐ ☐ ☐

6. Have distances to frequently used destinations such as lockers or toilets, been minimized?.. ☐ ☐ ☐ ☐ ☐ ☐ ☐

7. Are teachers' offices easily located and accessible to students?....... ☐ ☐ ☐ ☐ ☐ ☐ ☐

Factor 6 – Communication: *The physical environment communicates information to people regardless of their abilities.*

	VU	U	SU	N	SS	S	VS

1. Are learning spaces free from visual distractions?............................. ☐ ☐ ☐ ☐ ☐ ☐ ☐

2. Are noise levels in the learning spaces at a level that allows students to clearly understand what is being said?... ☐ ☐ ☐ ☐ ☐ ☐ ☐

3. Are students able to clearly understand messages broadcast through the public address system?... ☐ ☐ ☐ ☐ ☐ ☐ ☐

4. Are students able to understand televised programming in the learning spaces?... ☐ ☐ ☐ ☐ ☐ ☐ ☐

5. Are instructional spaces designed to allow simultaneous activities to take place and still serve the needs of hearing impaired students? ☐ ☐ ☐ ☐ ☐ ☐ ☐

6. Are there an adequate variety of communication methods for visually impaired students?... ☐ ☐ ☐ ☐ ☐ ☐ ☐

Factor 7 - Social Engagement: *The school environment accommodates diverse human needs and allows opportunities for active participation and inclusion.*

	VU	U	SU	N	SS	S	VS

1. Do the learning spaces support the students' ability to personalize their workspace?... ☐ ☐ ☐ ☐ ☐ ☐ ☐

2. Do the learning spaces function for small group meetings and quiet spaces?.. ☐ ☐ ☐ ☐ ☐ ☐ ☐

3. Do the learning spaces allow for individual pursuits?.......................... ☐ ☐ ☐ ☐ ☐ ☐ ☐

4. Are there places where students can informally meet with friends and teachers?... ☐ ☐ ☐ ☐ ☐ ☐ ☐

5. Does the building have a central area where students can exchange information?.. ☐ ☐ ☐ ☐ ☐ ☐ ☐

6. Are there exhibition spaces that allow all students to display their work?... ☐ ☐ ☐ ☐ ☐ ☐ ☐

7. Are students able to fully participate in outdoor activities?................. ☐ ☐ ☐ ☐ ☐ ☐ ☐

8. Does the cafeteria seating accommodate students of all abilities and sizes?... ☐ ☐ ☐ ☐ ☐ ☐ ☐

9. Do cafeteria service areas allow all students to see what is being served?.. ☐ ☐ ☐ ☐ ☐ ☐ ☐

10. Do all students regardless of individual abilities or size easily use all food services areas (snack bars, vending machines)?............ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Factor 8 – Versatility: *Furnishings and equipment aid in achieving an inclusive learning environment.*

	VU	U	SU	N	SS	S	VS
1. Are there enough tables and chairs of varying heights and sizes to accommodate each student's individual needs?	☐	☐	☐	☐	☐	☐	☐
2. Do work surfaces and equipment surfaces provide a range of choice (desk height, sink height, counter height, adequate clearance, chairs with right or left writing surfaces etc.)?	☐	☐	☐	☐	☐	☐	☐
3. Do work surfaces, equipment, tables and chairs provide a variety of adjustments to comfortably suit individual needs?	☐	☐	☐	☐	☐	☐	☐
4. Are recreational facilities equipped so all students can use them?	☐	☐	☐	☐	☐	☐	☐
5. Is electronic equipment usable by all students?	☐	☐	☐	☐	☐	☐	☐
6. Is computer software usable by all students?	☐	☐	☐	☐	☐	☐	☐
7. Do fitness facilities (gym, weight room, pool, etc.) accommodate use by all students?	☐	☐	☐	☐	☐	☐	☐
8. Do learning spaces provide accessible workstations?	☐	☐	☐	☐	☐	☐	☐
9. Are accessible workstations interspersed among non-accessible workstations?	☐	☐	☐	☐	☐	☐	☐
10. Is accessible seating in the auditorium, lecture halls, and sports facilities located in convenient places?	☐	☐	☐	☐	☐	☐	☐

Factor 9 – Imageability: *Overall features of the school environment can convey the effectiveness of inclusive design.*

	VU	U	SU	N	SS	S	VS
1. Does the school environment make daily activities more pleasant to accomplish?	☐	☐	☐	☐	☐	☐	☐
2. Does the school environment help students to feel a sense of belonging?	☐	☐	☐	☐	☐	☐	☐
3. Do features of the school encourage students to spend more time with others?	☐	☐	☐	☐	☐	☐	☐
4. Do features of the school encourage students to participate in varied activities?	☐	☐	☐	☐	☐	☐	☐
5. Do learning spaces avoid separating students with disabilities from their peers?	☐	☐	☐	☐	☐	☐	☐
6. Do features of the school give students more confidence in their abilities?	☐	☐	☐	☐	☐	☐	☐
7. How satisfied are students with the overall school environment?	☐	☐	☐	☐	☐	☐	☐
8. How satisfied are teachers and staff with the overall school environment?	☐	☐	☐	☐	☐	☐	☐
9. How aesthetically pleasing is the overall appearance of the school grounds and building?	☐	☐	☐	☐	☐	☐	☐
10. Is the entire school building easily accessible to all people?	☐	☐	☐	☐	☐	☐	☐

RESUME

PERSONAL INFORMATION

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EDUCATION BACKGROUND

Çanakkale Onsekiz Mart University - English Language Teaching / 2009-2013

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WORK EXPERIENCE

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Çanakkale Municipality Sport Club / Interpreter/ 19.07.2014 – 19.06.2015

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