



The Development of Student Arena Universitas Sumatera with Green Architecture

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Abstract. With a total number of 32,000 people, it is the reason to develop a student arena building that is more appropriate and sufficient to accommodate all students from 15 faculties. The location chosen was Medan Baru District is the Center for Education and Activities Trade / Business with a land area of 1.5 Ha. Design using a green architectural theme approach is such a way that the building can still maintain the image of the campus, which is a green campus while minimizing adverse impacts on the environment, which is still very natural. This building has supporting buildings that can support student activities from all faculties.

Keywords: green architecture, Universitas Sumatera Utara

Received 10 June 2022 | Revised 11 July 2022 | Accepted 11 August 2022

1 Introduction

Universitas Sumatera Utara was established in 1952 inaugurated by President Ir. Soekarno in 1957, which initially consisted of 4 faculties, namely the Faculty of Medicine, the Faculty of Law and Public Knowledge, the Teacher Training and Education Faculty, and the Faculty of Agriculture with 200 students. In his age, which now reaches fifty years, through various development programs implemented, much progress has been made, which made Universitas Sumatera Utara develop into what it is now. Currently, Universitas Sumatera Utara has 15 faculties, namely Medicine, Law, Agriculture, Engineering, Dentistry, Economics and Business, Humanities, Mathematics, and Natural Sciences, Social and Political Sciences, Public Health, Pharmacy, Psychology, Computer Science-Information Technology, Forestry and postgraduate. The number of study programs offered is 101, consisting of 8 doctoral levels, 28 masters, 15 specialists, five professions, 52 scholars, and 15 diplomas. The number of students currently registered is more than 32,000; 688, 688 of them are international students.

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The growing number of students certainly need a variety of facilities to support various campus activities. The said facilities will undoubtedly help a student's success because they can be influenced by internal and external factors. Internal factors come from ourselves, while external factors come from outside. One of the external factors that influence the learning process is learning facilities.

With students who have reached 30 thousand, student arena facilities to be very lacking in providing what students need. Student Arena of Universitas Sumatera Utara will later provide supporting facilities in the form of Coworking Space, which will later become the face of the student arena which can facilitate students in discussions, meetings, improve the performance of Student Activity Units, even train student talent and also to work on assignments, or even just hanging out with friends in the campus. Later, this building is designed as comfortable as possible so that it can increase student interest to be more enthusiastic about doing assignments and feel comfortable being on campus to discuss with friends. Moreover, later the Student Arena will become one of the iconic for the Universitas Sumatera Utara, which is the best university on the island of Sumatera.

2 Literature Review

Student Arena

Student Arena is a building block built for student activity cent according to their interests and talents in learning activities, sports, arts, and other social activities outside the academic sphere that they do not get on campus.

Student Arena of Universitas Sumatera Utara is a place for students to be freer to express themselves in working in any field. The theme of Green Architecture is very supportive of providing aesthetic visual effects where one of the goals of this design is for students to feel comfortable in doing their work or just discussing. With the theme of Green Architecture, it is expected to realize the Student Center into a building that characterizes it as a supporting building for the Universitas Sumatera Utara.

The theme becomes a guide in designing which is a characteristic in design that makes handles with the same function. design ideas should pay attention to the site background analyst. The concept with this theme has a very broad meaning and application, including green architecture, ecological architecture, and so on. With global warming conditions, this sustainable concept is very suitable for this situation [1].

3 Methodology

The method used in site selection is the discussion of primary data, namely data sources that directly provide data to data collectors. Moreover, secondary data, namely data that does not directly provide data to researchers, for example research must go through other people or search through documents that are analyzed and concluded.

The next step is design analysis. At this stage, research on a direct basis of field observations. The final step is the design concept. This concept through observing user needs, environment, research, studies conducted, problems found, and the solution obtained (Figure 1).

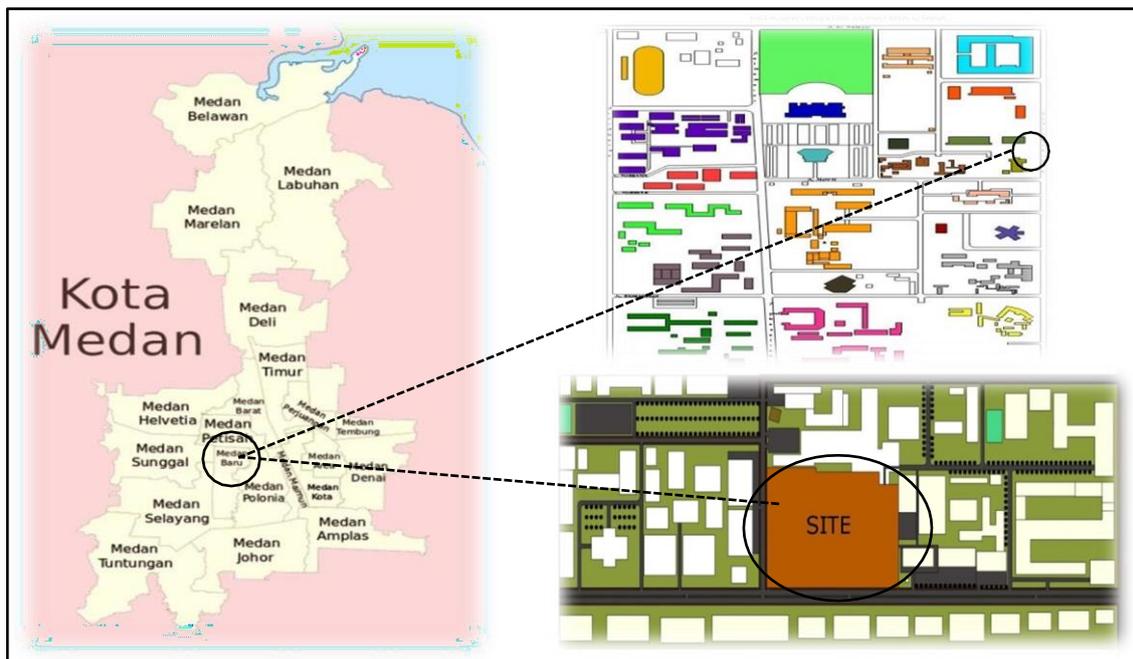


Figure 1 The location of the Development of Student Arena Universitas Sumatera Utara

4 Result and Discussion

Project Description

The title of this project is the Development of Student Arena Universitas Sumatera Utara. This building will later with supporting facilities for students who are comfortable to arouse the interest of students to be more able to stay on campus and also provide spaces suitable for activities within the USU Student Arena so that students feel comfortable being in the room so that circulation which does not make the room feel cramped so that students are freer to move in a designated room. The location of this project is on the USU Campus, Jalan Dr. Mansur NO. 9, Padang Bulan, Kec. Medan Baru, Kota Medan, North Sumatra 20222.

For transportation to and from the site, more by private vehicles, and also uses public transportation, but not a few also walk to the location, because public transportation only reaches the intersection of the campus.

Design Theme

The application of the theme really needs to consider the principle of sustainability in order to achieve thermal comfort, especially in tropical and humid areas. The laying of some vegetation can provide ventilation to the building thereby reducing the use of air conditioning. The land area has a larger area than the facade so it has the potential to expand the green area [2]. A limited land area, the concept of vertical plants or Vertical Gardens can be applied. Vertical Garden is a concept of plants with an upright position that is arranged in such a way in a perpendicular plane [3]. This concept can make the space feel bigger with a conventional garden. With the number of plants that can be planted with a greater number of green open spaces can significantly increase [4].

A building can be interpreted as a building arrangement consisting of several rooms that are arranged in stages and have a specified space or facility, this can overcome the problem of limited land [5].

Location Choosing

Site selection made the top priority in the placement of the Student Arena as a public facility located on the USU Campus, Jalan Dr. Mansur N0. 9, Padang Bulan, Kec. Medan Baru, Kota Medan, North Sumatra 20222, is an access area from USU's; 1st gate. The building can be defined as a building consisting of several rooms arranged in stages and has the same space and facilities to overcome the problem of narrow land rate and limited land in urban areas. The basis for choosing a location can be considered on several criteria; seen from the access to the location which is very easy because this location is inside the USU campus [6]. Tread condition is topography, relatively gentle sloping land contoured. Climate, consistency, and lighting optimize sunlight and natural air pollution. Utility Availability of existing utility networks such as electricity, water, telephone, road (Figure 2).

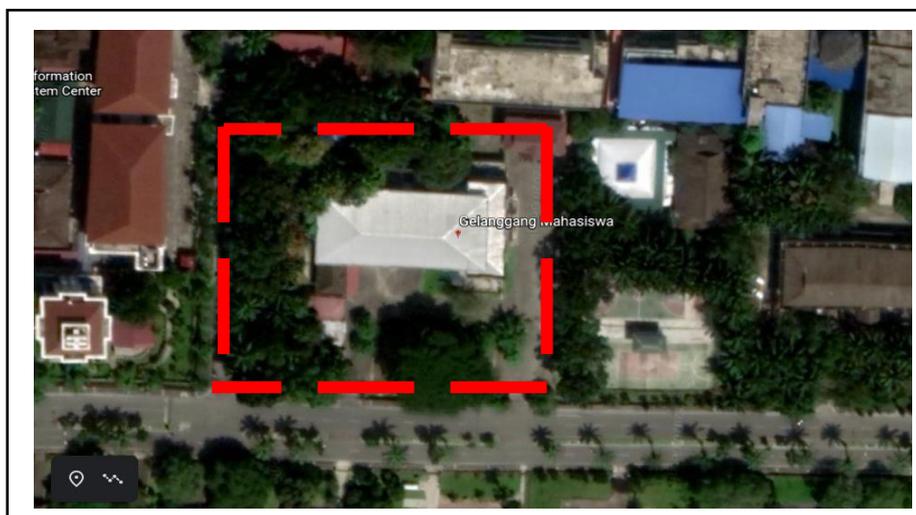


Figure 2 Map of the Student Arena Universitas Sumatera Utara

Extensions and Building / Environmental Regulations.

Land area: $\pm 1,5$ Ha (15.000 m²), building area: 9,819 m², existing Conditions: USU Student Center Building. Contour: Relatively flat.

Regional Boundaries

Land area boundaries are as follows: Northern Frontier: Basketball Court. Eastern Boundary: Lecturer Housing Complex. Southern Boundary: Faculty of Computer Science and Technology Information. Western Frontier: Student Activity Unit; "Kompas USU."

Zoning

The basic concept in the design of the Student Arena of Universitas Sumatera Utara building is to create a building that functions to unite the hobby activities of student interests on the USU campus and can create positive and productive activities and also create a harmonious atmosphere of space.

The building inside the site is a multi-mass building where there is a community building, art building, coworking space, amphitheater, and also a mosque. Amphitheater's location is in the middle of the building to become the center of student activities (Figure 3).

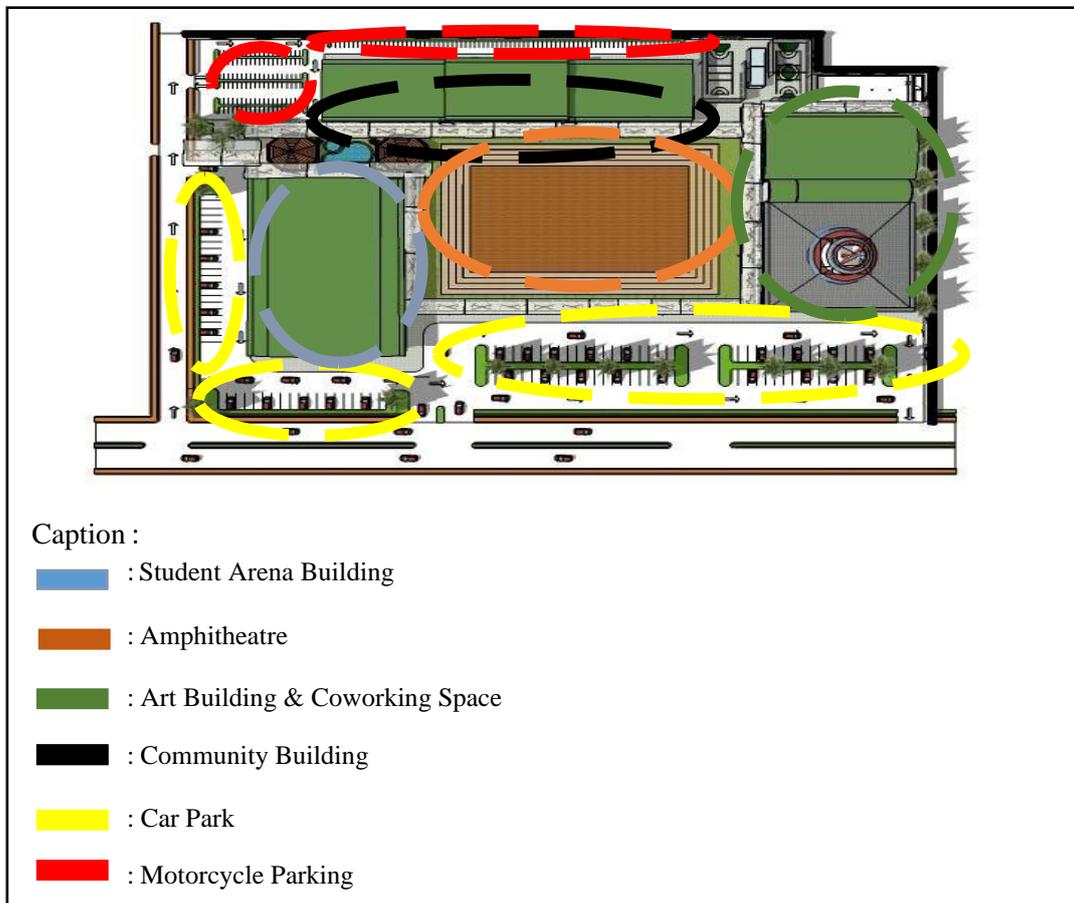


Figure 3 Zoning Concepts of Exterior Space

Concept of Circulation

The entrance to this building consists of 2 types, namely for pedestrians and for access to use vehicles. Pedestrian access is on Alumni Street, and also on University Street. So that students who are in the Alumni and University Street do not need to be far to enter the building area (Figure 4).

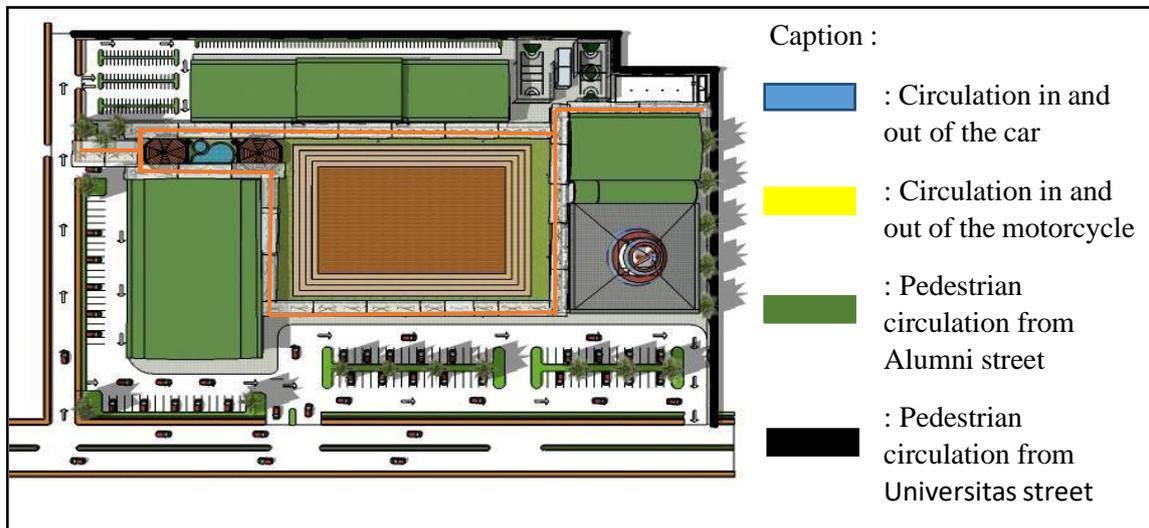


Figure 4 Concept of Circulation

Concept of Vegetation

In the vicinity of the building, given several types of vegetation, in addition to being a buffer, this vegetation also functions to absorb pollution and noise from the front and side streets of the building [7].

The type of vegetation used has benefits for buildings, including: Ketapang, which functions as a shade tree and is easy to maintain. Palm serves to absorb as much as 200 litres of water per day. Ashoka helps to reduce pollution and absorb dust [8] (Figure 5).

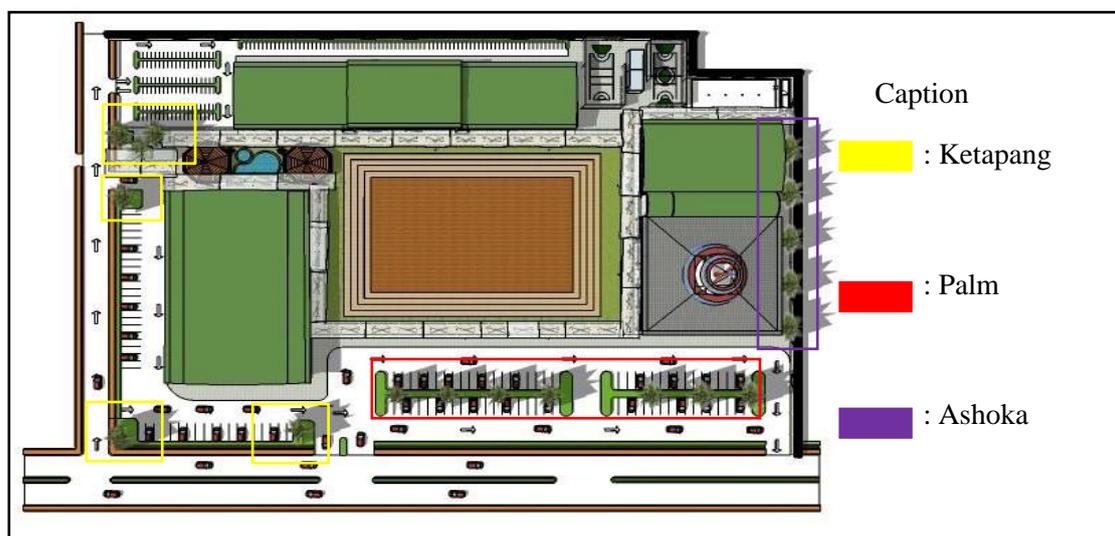


Figure 5 Concept of Vegetation

The use of natural materials is believed to reduce heat in buildings, as evidenced by research on installing vertical plants with a distance of two meters with a two-level configuration can reduce temperatures by 1-4 ° C at 10 pm [9].

Concept View

At the site on University Street, there are several views in the area around the site with the primary function as education, settlement.

The main view of the building or to the east of the building is the Lecturer Housing located on Universitas street. There are no problems with this view, because the view is across the

building. The second view of the building is the basketball court / northern part of the building. There is no road beside the land because it is a building next to the student arena itself. The third

The view of the building is the Faculty of Computer Science and Information Technology. This view is opposite the building, next to the building between the Student Arena and the Alumni street (Figure 6).

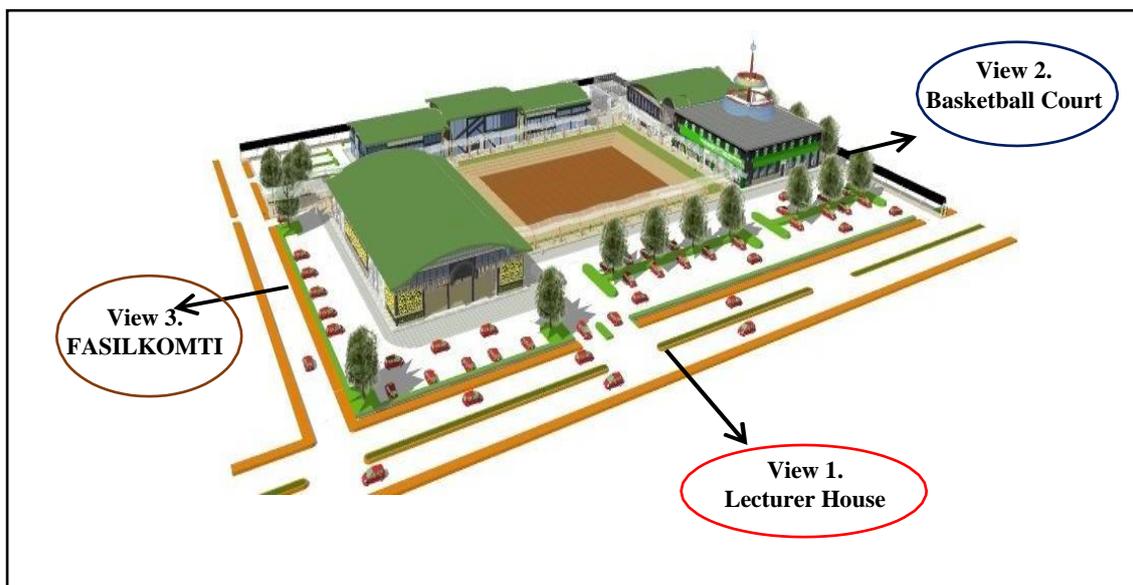


Figure 6 Concept of View

Green Campus is a form of education that uses nature as learning material for students so that students are able to preserve nature for the next life [10].

Interior Design Concept

In this building, there are several zones, namely public in the form of the hall, lobby, coworking space, café. Semi-public in the form of performance areas, discussion rooms. Private in the form of management room, employee room, meeting room, training room. Services in toilets, prayer

rooms, ATMs, utility rooms, print and, copy rooms. The spaces at the USU Student Arena are in the creative and educational areas, including:

1st floor

The arena, the room that serves as a venue, large campus meetings, rent a wedding hall, professor inauguration, national seminars with a capacity of 400-500 seats. In the performance hall, things to consider are: Unity between the stage and the stands. Lighting. Coworking Space, supporting space to conduct activities such as discussions, work on assignments, meetings, and there is also a refreshing room [11]. ATM center. Atm Centre for students or people with needs. Musholla, to avoid noise while worshipping, therefore put a small mosque on the top

floor of the building. Art Building, spaces used for students practising art activities. Versatile Spaces Spaces used for exhibitions of art on certain occasions. Community Building, for the activities of all UKM faculties, the campus of the Universitas Sumatera Utara (Figure 7-12).



Figure 7 Interior Student Arena



Figure 8 UKM Interior Space



Figure 9 Music Studio



Figure 10 Dance Studio



Figure 11 Public Space



Figure 12 Cafeteria

2nd floor

Organization / Community Room, space used for meetings or discussions around the Universitas Sumatera Utara Student Activity Unit from all faculties. Coworking Space, supports space to conduct activities such as discussions, work on assignments, meetings, and a refreshing room. Management Room spaces contain building managers, teaching staff rooms, employee rooms, meeting rooms, archive rooms. Manage all existing activities in the building. Organization / Community Room, space used for meetings or discussions around the Universitas Sumatera Utara Student Activity Unit from all faculties (Figure 13-16).



Figure 13 PEMA Interior Space

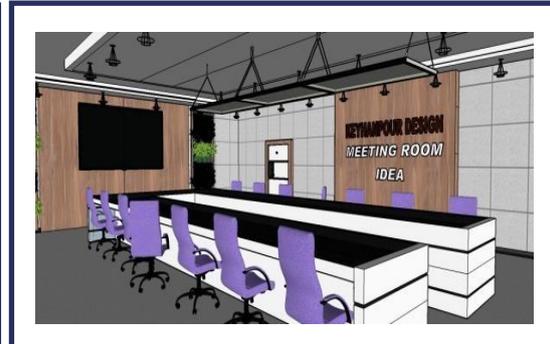


Figure 14 Meeting Room



Figure 15 Discussion Room



Figure 16 Work Space

Exterior Design Concept: The area is for an amphitheatre and provides a gazebo for students who want to go out for visiting guests (Figure 17-18).



Figure 17 Mini Gazebo



Figure 18. Amphitheatre

We need a foundation which is the lowest structure with a function to support the building and transmit it to the ground [12]. Stages in the design require two stages. The first stage, this is the stage of collecting data. After that, it is continued in the second stage, namely the design stage, which is the stage where compiling the concept into an as expected [13].

The size for the pedestrian path is about 20-30 cm with the track not too small and flat [14]. Reducing the use of energy in the room can be by arranging plants in front of the building, this method can reduce noise if it is arranged tightly and massively like the arrangement of bricks. In addition, there are also many plants that effectively filter dust and air pollution [15].

5 Conclusion

The student arena is a means for students to do all activities of various faculties by providing a student arena design that looks interesting by showing the factors by the theme created. Besides that, this student arena offers educational facilities to arouse students'; interest in staying on campus where rooms are suitable for activities inside the Universitas Sumatera Utara student arena. This student arena also provides supporting facilities, namely Coworking Space, wherein this coworking space, students, lecturers, and also guests of lecturers can carry out.

Activities or work comfortably and also can carry out discussions in the space provided. Coworking Space will be the face of the scholarship arena. After researching several students, the main factor for students is complicated to feel comfortable in the campus environment due to lack of facilities to do assignments or discuss with friends from various faculties.

The students area arena is built in the Universitas Sumatera Utara, Medan Baru, which is a centre for education and trade or business activities. The Universitas Sumatera Utara campus has an image as a green campus where the design of the student arena applies the Green Architecture theme to maintain the consistency of the campus image.

Acknowledgement

This research is about designing a student arena with the concept of developing an educative and entertaining area that can also add insight; the authors thank the Department of Architecture, Universitas Sumatera Utara, for the guidance given to the author in the process of writing this research.

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