Education and Training Center for Youth with Multisensory Design Approach

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Abstract—**Lack of education and training facilities for youth people who are in accordance with the visual learner's learning system makes one aspect of the lack of interest of youth in developing and increasing their productivity. Therefore, this research is conducted to provide an architectural concept that can adapt to the visual learner's learning system for youth. The design concept of the design uses a multisensory theory approach to create attention, sensation and memory into the visual learner learning system for youth. In addition, the direct analogy approach to visual functions becomes one of the design strategies to give attention especially youth in better understanding the stages to be carried out, namely the professionalism stage. Architectural factors that influence the productivity of youth are the shape, scale, color, and materials used in rooms and buildings. This was obtained by means of observation and participatory questionnaires with youth of productive age. Besides the professionalism factors that can assess the productivity of youth are knowledge, skills, and attitude. This was obtained by the questionnaire method with the HRD manager. The method used in the idea uses the concept base framework design method. To present a moment in the design framework, it is necessary to have a research method in it, namely participatory qualitative methods, literature observation and environmental mapping on selected land. The moment presented will limit the exploration of elements that have a role in increasing visual perception in youth's productivity. Moment will evaluate architectural factors that can be adapted to existing environmental conditions, so as to create the perfect concept in increasing the productivity of youth.**

Keywords—**Productivity, Visual Learner, Multisensory Design, Direct Analogy.**

I. INTRODUCTION

SURABAYA is the city with the second highest population in Indonesia. The population of productive age in Surabaya City is very dominant, reaching 73.44 percent of the total population of the city. Very productive age consists of 22-28 years age group. Very productive age is also referred to as young people, which have very vital characteristics and differ according to region, and socio-economic. One of the main characteristics of the younger generation is marked by increased use and familiarity with communication, media and digital technology. Being raised by technological advancements, the younger generation has creative, informative, passionate and productive traits. Today's generation of young people has vast opportunities and opportunities for innovation. Another strategy to maximize the potential of millennial generation is to form new entrepreneurs so as to create jobs.

Highly productive population is one of the important aspects in making better and better quality human resources.

If this is inadequate or not in accordance with the concept of character of young people, then it will become a big problem that can be experienced by groups or cities. As a result, the number of open unemployment in the productive age group in Surabaya will increase as shown in Figure 1.

The theory is supported by research, young people more easily accept the concept of learning with a visual learner system that can improve memory function and reading ability of young people [1]. In addition to a visual learning attention and focus so that stimuli given in the form of architecture can be accepted by young people in the development process. In shaping an individual's visual perception it needs to involve vision. Vision provides information that will form the impression of a visual image. Visual appearance becomes very important because the human brain works from visual, auditory, and semantic codes [2]. The work process in the brain is hierarchical which means it cannot be reversed [3]. Visual theory in architecture can be formed through 3 approaches, namely the color, shape, and layout of space [4].

The concept of architecture plays a very important role in increasing the productivity of young people, an effective and efficient method is the visual learner. Visual learner itself is a method of approach for young people to be more productive through media in the form of visual images [5]. Multi-sensory design theory combines visual and haptic senses into architectural art concepts that can optimize the level of productivity of young people. Architecture itself becomes a media for sensory design or visual ideas to help increase the productivity of young people by optimizing a space shape, space scale, color and texture of the material used in the design process.

In the design process, the design framework used is Concept Based Frameworks can be generated using metaphors, analogy, or questions that will be obtained to become a big idea of the design concept. At this stage, the tools used are analogies. The important thing in analogy is the similarity between buildings and objects that are analogous. The equation here does not mean that it is truly similar to the object and is only enlarged in size, but what is meant is the equation in the form of the message to be conveyed. The analogy approach is divided into three types, namely personal analogy, direct analogy, and symbolic analogy. The analogy applied is a direct analogy, where the analogy to be used is the eye analogy. The eye itself is the most vital organ of the human body to be able to understand visually, the characteristics of the eye become a concept for the design to be used. The analogy approach is an effective tool for generating big ideas in the Concept Based Framework method. Big ideas in the Education and Training Center for
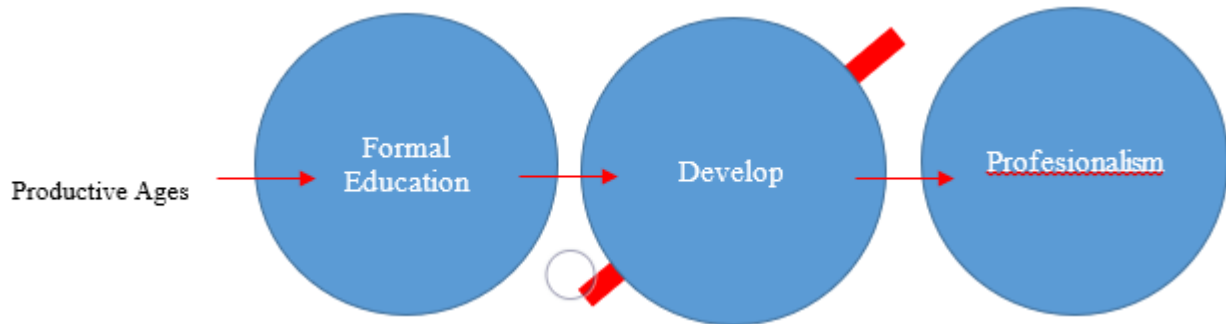
IPTEK Journal of Proceedings Series No. (6) (2020), ISSN (2354-6026)　　　　　　　　　　　　　427

The 6th International Seminar on Science and Technology (ISST) 2020
July 25th 2020, Institut Teknologi Sepuluh Nopember, Surabaya, Indonesia

Figure 1. Diagram Process of Human Resource Productive.

No.	Studi Preseden	Dokumentasi	Visual sistem	Haptic Sistem	Auditory Sistem	Taste-smell Sistem	Basic Orientation	Inovasi
1.	Viettel Academy Education Centre		ada	ada	ada	ada	Tidak ada	• Pegoptimalan elemen mempengaruhi persepsi visual • Orientasi bangunan dan massa memberikan kesan pengalaman sense berbeda • Pemilihan bahan material
2.	Sino-Danish Centre for Education and Research		ada	ada	ada	Tidak ada	ada	• Unsur alam sebagai media interaksi • Bentuk arsitektural sebagai media visualisasi • Fasad bangunan menstimuli pengguna

Figure 2. Explanation of the Exploration Aspects.

Youth are referred to as analogies which have the beauty and crucial characteristics in the human body, are complex in character, and systematic and can distinguish between shapes and colors. These characters will be implemented in the design. Therefore, "What is architecture?" is the Center for Youth Education and Training as an eye for knowledge, skills and behavior with the surrounding environment.

II. DESIGN METHODS

The theories that are used in this paper has consisted of design multisensory as the main theory and space & place by visual and haptic perception will be described below:

A. Concepts Based Frameworks

The design method used is Concept Based Framework [6]. This method applies a multisensory design theory approach by utilizing visual perception used as a planning tool. The senses used to accept the concept are the limbs of the eye which will give rise to perception when it comes to the haptic system or taste. The visual system and the haptic system contribute to stimulating the brain to give rise to visual perception for its users. If the visual system is not combined with other sensory systems, it will give a flat, sharp, and unrealistic impression effect. Therefore, multisensory theory provides perspectives to give rise to the spatial experience [7].

Visual itself must involve sensation, attention, and memory to create visual perceptions that users receive [8]. To establish the approach used in the concept of visual perception, the concept based method must understand what the architecture is. Therefore, the hypothesis of this concept is architecture as an interactive sensory media for young people in Surabaya. Big idea Education and Training Center for Youth as eyes of knowledge, skills, and behavior for young people. With assets of natural resource elements and natural material elements to provide appropriate perceptions to give rise to spatial experience in the process of development.

B. Analysis of the Design Object Concept

In the design of the Youth Education and Training Center in Surabaya, there are a number of basic ideas and initial concepts that arise because of the social problems experienced by the Surabaya City Government to reduce open unemployment rates that are relatively high in Surabaya. The government has implemented a system of compulsory education for 9 years to help develop mindsets for young people to gain sufficient insight and knowledge, but the lack of advanced programs or systems for young people towards a
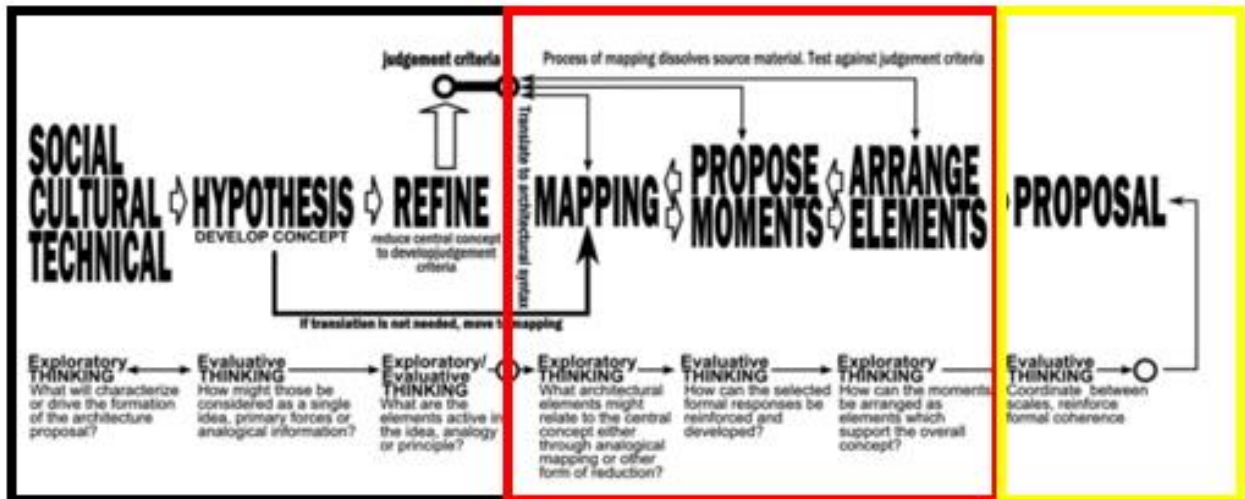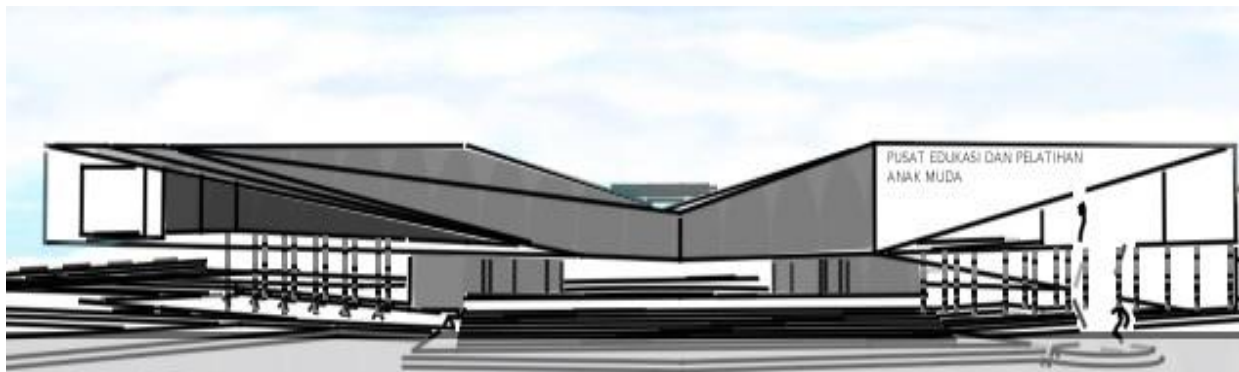
Figure 3. *Concept Based Framework.*

Figure 4. Education and Training Centre for Youth with Multisensory Design Approach.

stage of professionalism that is lacking and in accordance with the characteristics has a considerable impact for young people to be more developed, both in character, mentality, and professionalism. This has become one of the causes of rising unemployment in the city of Surabaya.

The concept of building a Youth Education and Training Center utilizes a visual learner system that is more easily accepted by young people. Architectural response with a multi-sensory theory approach with collaboration between the visual system and the haptic system to generate space experience with visual perception tools. The factors that are needed and decisive in planning and design are facility formed object data, both space requirements, building design concepts, site selection, and themes. In addition, in terms of architecture requires analysis of natural resource assets, and material elements to support the concept of visual perception provided. The Youth Education and Training Center has a big idea of architectural concepts as a sensory media with an analogy approach to the eye as a form of active visual sensory interaction for the knowledge, skills, and attitudes of young people towards the environment and themselves. Therefore, architecture is a sensory media to increase the productivity of youth.

C. Design Exploration Aspects

The aspects used in the exploration of design are visual aspects and architectural taste. In this aspect there are several more aspects, namely in the form of color, shape, space scale, material texture, and optimizing natural light and air. The aspects that greatly affect the visual learner learning method are the colors and shapes of the buildings. The focus of these aspects is expected to develop the productivity and interaction of young people. Color and shape become assets that affect the visual system and the haptic system which are expected to provide visual experience and space for youth as shown in Figure 2.

A building and space concept that presents sensations from every senses in humans can be seen. The sensation given can provide a perception for users in activating activities in buildings and spaces. Besides optimizing the natural surroundings can also provide comfort for users in carrying out activities in the area or building. Literature in the figure becomes data that will be developed in the design of education and training centers for young people with a multisensory design approach in the city of Surabaya as shown in Figure 2.

III. RESULTS AND DISCUSSION

At this stage, using a concept based design framework with the validation steps described in forming a proposal that is suitable for the needs of young people in increasing their productivity into the world of professionalism.

A. Design Process

He design process that will be applied to the Youth Education and Training Center uses the Plowright method approach that determines the process design specifications by
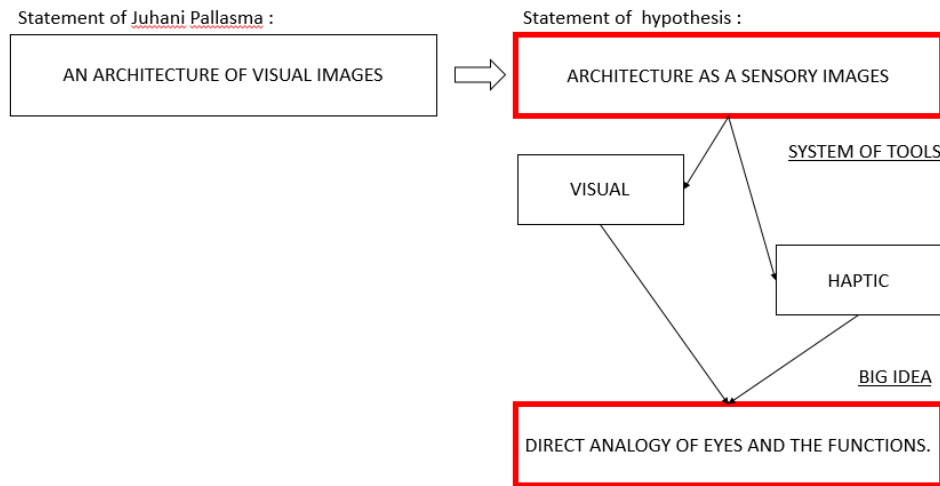
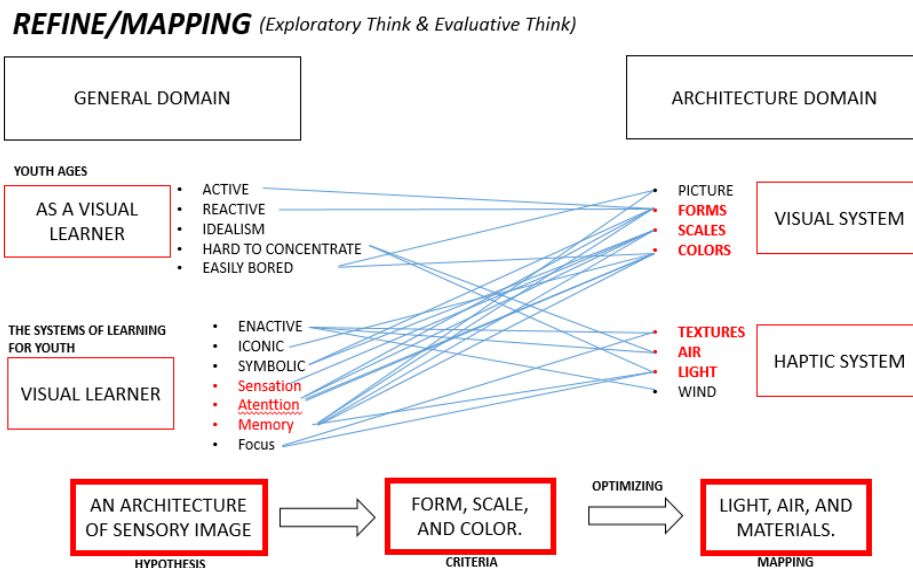Figure 5. Hypothesis Diagram of the Role of Architecture.

Figure 6. Diagram *transfer domain to domain.*

selecting social and cultural issues. Then it integrates with the Concept Based Framework method which is used to provide tools that can assist in the design process. In addition, the data becomes an aspect that becomes a benchmark for designing the Youth Education and Training Center.

This design uses the Plowright Concept Based Framework methodology, where the method has three parts in a framework of thought, the first part is the stage of looking for an issue of social, cultural, and technical issues. Then provide a hypothesis based on issues and validation methods used in the form of literature, precedents, questionnaires, and the stages of the design framework used. In Figure 3, the first part will find the criteria at the refining stage, which can then be developed in section 2 of the design framework. The second part is the validation stage in determining and developing the criteria given in the previous section. The third part is the final part that has been designed with maximum thought and data. The following stages of the design framework that has been carried out.

B. First Part

In this part the designer uses the exploration of thinking at the social, cultural, and technical stages to explore information and data that become a problem issue. Then in the next stage a hypothesis is used to combine concepts and evaluate thinking from the correlation between the issue and the concept of a given idea. The last stage of refining will get the criteria from the data issues and concepts provided using the exploration and evaluation mindset.

1) Social, Cultural, Technical

At this stage, the designer is required to explore his thoughts in order to develop ideas and issues that are developing in Surabaya, and make a suitable solution proposal in the field of architecture. The issue taken is social and cultural issues, where the aspect of unemployment is quite high in the city of Surabaya with the majority being in the productive age or can be called on young people aged 21-28 years. This age is risky due to the lack of formation of non-formal education to reach the stage of professionalism, both from interaction, communication with the environment, etc. Architectural issues raised are in the form of shape, scale, color and texture of the material in the building to create visual perception that can increase the productivity of youth to interact interactively with the surrounding environment as shown in Figure 4 [9].
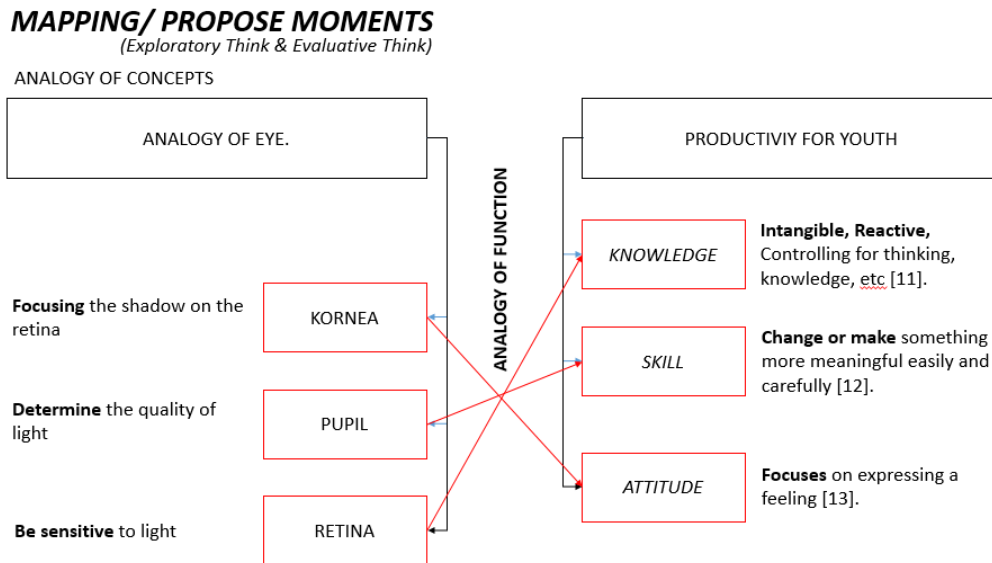
Figure 7. Diagram *Mapping* Analogy of Function.

2) Hypothesis

This stage can determine what the meaning or meaning of architecture for the design of the Center for Education and Training of Youth in Surabaya. Where the designer evaluates his thoughts to be considered as an idea, the main strength or information needed. At this stage, the designer determines the Youth Education and Training Center which positions architecture as a sensory media. The role of architecture that must follow time, the theory becomes a multisensory theory, which means that it optimizes two or more of the human sensory systems to provide a perfect perception from time to time [7]. Therefore, the designer combines the types of visual and haptic sensory systems, because the haptic or sense of touch becomes the senses that need to be strengthened in architecture. Interactive space is non-formal and in-formal education, which can be obtained from several things, such as talking or interacting, space experiences experienced, visual buildings with scale, lighting with materials, environmental influences with buildings, and so on as shown in Figure 5.

3) Refine

At this stage the designer starts to filter ideas and data to be able to focus more on the right solution and not branching. Here the designer uses a domain to domain transfer tool to get the criteria needed in a draft of the Youth Education and Training Center. Domain is divided into two parts, namely the public domain and the architectural domain. The designer can provide design criteria for a building design from a multi-sensory design approach theory, such as optimizing the architectural domain of visual sensory systems and haptic sensory systems. There are several criteria for elements that can be explored into architecture such as elements of light, air, material, texture, color, scale, shape, and image [7]. While from the public domain there are two important points in increasing the productivity of young people, namely young people as users of visual learner learning systems and visual learner learning systems.

From these two things, the criteria can be analyzed such as young people who have active, reactive, idealistic, difficult to concentrate, and bored young characteristics. While the

visual learner learning system criteria, have criteria that are enactive, iconic, symbolic, sensation, attention, memory, and focus [1]. Both of these criteria are linked together to evaluate the exploration needed in accordance with the concept of the building as shown in See Figure 6.

C. Second Part

This stage is the validation stage of the issues and concepts presented, the concept can provide a solution by issuing design criteria. The mapping phase uses the thinking corporation to develop concepts with the given criteria. The propose moments stage evaluates the criteria that have been adjusted to the development of the concept of ideas. Next set the supporting elements of the concept of ideas and criteria produced.

1) Mapping

Mapping in question is putting factors or elements in the field of architecture that can be used as a centralized concept through mapping analogy or other. At this stage, design must explore the thinking of the first part. The author starts mapping the elements that can be assets or constraints in the design. Bring up a statement on the role of architecture which at this stage can be determined that the building of architecture as a visual sensory media and taste to help the visual learner learning system. Assets in design such as color, shape of building, and optimizing lighting and natural air can trigger space experiences through visual perception and taste so as to develop and increase the productivity, knowledge, skills, and attitude of young people.

At this stage the designer also uses domain to domain transfer to validate the design idea that uses the analogy of the eye as youth productivity. The equation here does not mean that it is truly similar to the object and is only enlarged in size, but what is meant is the equation in the form of the message delivered [9]. The analogy used is a function of the eye organ that is adjusted to the concepts of knowledge, skills, and attitude.

In Figure 7, the mapping stage explores an analogy of the eye organ into the productivity of young people such as, the cornea which has the function of an organ that focuses the

IPTEK Journal of Proceedings Series No. (6) (2020), ISSN (2354-6026)   431

The 6th International Seminar on Science and Technology (ISST) 2020
July 25th 2020, Institut Teknologi Sepuluh Nopember, Surabaya, Indonesia
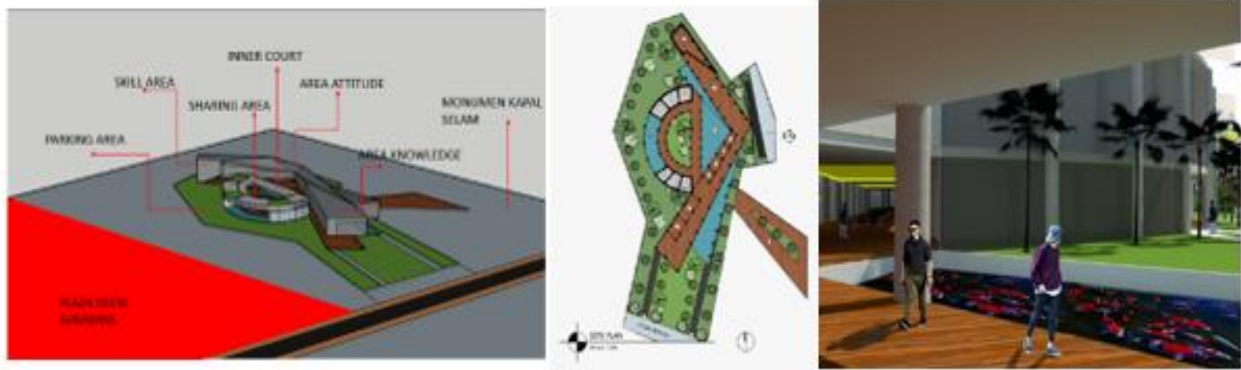
Figure 8. Diagram Analysis Space Programming with The Environment.

Figure 9. Diagram of Supporting Element of Moments.
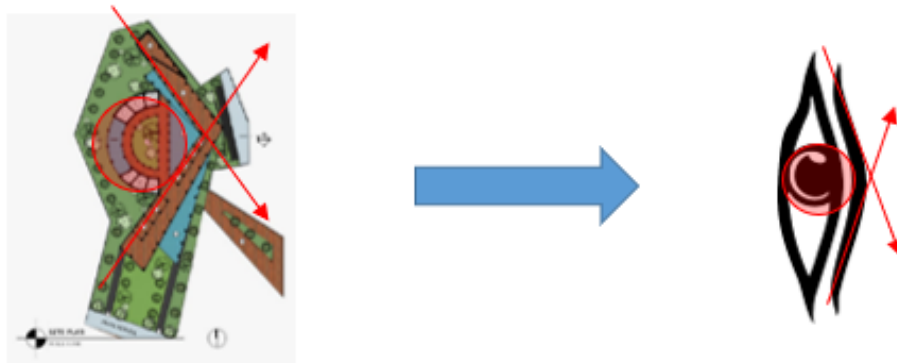

Figure 10. Direct Analogy Diagram of the Eye on the Building Mass.

shadow is analogous to the attitude which has the function of focusing a characteristic, attitude, and verbal youth. Then the pupil that has a function as an organ that determines the quality and intensity of the light required is analogous to a skill that has the function of determining the technical quality of the insights or knowledge gained. And the last is the retina which has a very sensitive organ function that provides visualization of what is seen by the eyes analogous to knowledge that has a very important role in the productivity of young people to think about solving problems, making decisions, controlling actions, etc.

2) Propose Moments

At this stage the designer evaluates responses that can influence design ideas, whether in the form of social, cultural, technical, issue, etc. The designer thinks about existing conditions or contextualism around the site. Young people aged 22-28 years and culture are one of the big aspects to provide the right goals for the Youth Education and Training Center program in Surabaya. At this stage the designer directly enters the moments of assets that can support large concepts in building users. Such as the existing environmental conditions in the design land which is used as the concept of unity and as a view of certain areas, climatic conditions or solar lighting to determine the concept of openings in the room as shown in Figure 8.

3) Arrange Elements

This stage the designer explores thinking about the elements that can support the concept of the designer idea. Elements that can be explored in the design to be reviewed include building facades, design implementation with concepts, materials used, colors, and scales that are integrated. Spatial layout functions that are in accordance with the concept. The vegetation element is also an important aspect to provide insight into the importance of outdoor space for socializing. The design of the environment can provide strong aspects for building users so they can actively interact

with the surrounding environment. The water element contained in the eye analogy can be implemented into the design of the Youth Education and Training Center with the design idea in the building by applying every vital space or space to be surrounded by a pond which is expected to give rise to quiet haptic and visual perception as shown in Figure 9.

D. Third Part

This stage is the last stage in the design framework, where the proposals given are adjusted to the big concepts and criteria produced. These concepts and criteria are maximized with elements and momentum that are appropriate to the time, situation, conditions, and activation of activities in them.

1) Proposal

This stage is the final stage in the design framework. The designer can propose solutions to issues or ideas that develop in previous sections. At this stage the designer evaluates ideas into contextual implementation that can change the technical results of the design idea. In the Concepts Based Framework parts are interrelated and change and develop according to the ideas and elements that influence them, but the concept or ideas of a designer can be justified. The design that will be proposed is the Youth Education and Training Center in Surabaya with a multisensory design approach that makes architecture a sensory media, with big ideas as eyes for knowledge, skills, and behavior with the surrounding environment as the diagram described as shown in Figure 10.

IV. CONCLUSION

The conclusion of the analysis above is the role of architecture is vital in helping the process of developing the productivity of young people in integrating concepts with psychological youth. Architecture becomes one of the tools to perfect the productivity of young people in their development into the world of professionalism. Some aspects of architecture that can affect the productivity of young people are:(1)The shape of the building, is a visual aspect that can provide an attraction for young people in attracting attention to activate the program that has been given in the building; (2)Spatial scale, is a visual aspect and a sense that is presented to reduce the level of boredom of young people in carrying out activities in the room; (3)Color, is a visual aspect that can enhance the enthusiasm of users of the room in accordance with the concepts and characteristics of the colors presented; (4)Material and texture, is the visual aspect and taste given to provide comfort for building and room users; (5)Optimizing air and natural lighting, is an aspect of the taste that is presented into the concept of the room to be attractive to users of the room.

Maximizing a building's shape, scale, color and material criteria can give young people a quick understanding of how to improve their productivity. The attractive form and playing space scale become one of the main aspects that can attract the attention of young people in their activities and visits. Yellow color becomes a color that can increase morale and give an interactive impression in the room. These criteria can be generated with a multisensory design concept. Visual and haptic systems become tools to create perception in developing young people's productivity.

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