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Growth Mindset In Teaching 3D Animation Shapes For Beginner

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ABTRACT
This research aims to equip the Stofo community with the necessary skills and knowledge to effectively use the 3D Max application for comic creation. The goal is to empower participants with not only the technical skills but also the mindset needed to utilize this 3D modelling software effectively. This is crucial because 3D modelling plays a pivotal role in the global comic creation industry. By mastering 3D modelling, Stofo comic artists can produce comic chapters and explore various aspects of industrial design and web tone in the context of the Fourth Industrial Revolution and Society 5.0. The method of this research is a qualitative approach involves instilling an understanding of the significance of learning 3D modelling and offering step-by-step tutorials within a computer lab. All participants will receive gradual instruction, starting with the basics of the 3D Max application, including commonly used tools and the creation of simple 3D models. The outcomes of this endeavour demonstrate that: (1) participants exhibit a strong interest in using 3D modelling for comic creation after receiving growth mindset theory; (2) they can produce fundamental 3D models for comic backgrounds with five (5) at high level, six 6 at intermediate level, and nine (9) at beginner level; and (3) they are enthusiastic about honing their 3D modelling skills for comic purposes. Therefore, It is crucial to empowers the Stofo community with 3D modelling skills and mindset, fostering creativity and potential in the realm of comics and design.

Keywords: 3D Max, 3D Modelling, Comics, Fourth Industrial Revolution, Society 5.0

1. INTRODUCTION

In the 4.0 industrial revolution and Society 5.0, the need for Human Resources (HR) capable of mastering technologies like 3D modelling is essential in various aspects of life, such as industrial design and comics. Ellitan (p.8, 2020) concluded that to seize opportunities and address the challenges of the 4.0 industrial revolution and Society 5.0, Indonesian society must possess data, technology, and human literacy skills.

Furthermore, the 4.0 Industrial Revolution emphasizes artificial intelligence, such as Artificial Intelligence (AI). The 4.0 Industrial Revolution is marked by technological breakthroughs in various fields (Putra et al., 2020; Rahayu, 2020). Moreover, (Surya, 2020) explained that the Fourth Industrial Revolution or Industry 4.0 is built on the foundation of the digital revolution and introduces significant technological innovations in various fields, including robotics, artificial intelligence, nanotechnology, quantum computing, biotechnology, the internet, electric vehicles, and 3D printing. This revolution reflects a new paradigm in the integration of technology into society and even the human body.

On the other hand, Society 5.0 emphasizes the human aspect. Carolina N R et al. (p.1, 2021) outlined that in 2016, the Japanese government initiated a concept called "Society 5.0." Society 5.0 is a society with high intelligence and proficiency in technology, including mastery of software that aids in solving everyday issues like transportation, energy management, emission reduction, and more (Hermawan et al., 2020; Maya Novita Sari & Destri Fitriana, 2022; Pujiono, 2021; Rezky et al., 2019). In this new era, technology is combined with superintelligence, highly integrated with big data, the Internet of Things (IoT), and AI to facilitate solving social problems by integrating the virtual and physical worlds. The ideas of the 4.0 industrial revolution and Society 5.0 are not significantly different. These two terms are interconnected, complementing technological advancements for the benefit of humanity. In the development of Stofo community's HR capabilities, intensive research in the use of the 3D Max application is crucial and timely in this era.

However, the skills of human resources are still lacking in Makassar city, as one of the largest city in Indonesia. Therefore, for Stofo Community to improve their technical skill in creating artworks with 3D application such as 3D Max is vital. This is both to face the challenges in todays world, and also to adapt to the need of society 5.0. it is mandatory to prepare future generation to have the skills and ability for the improvement of arts in South Sulawesi, especially in Makassar. Therefore, to make sure the research is successful, the implementation of growth mindset in early stages of training will be the main focus of the research (Gottfredson & Reina, 2021; Handa et al., 2023; Naderi & Fathi, 2022; Sahagun et al., 2021). Growth Mindset is paramount to foster students understanding to improve their skills based on practices rather than their view on multiple intelligence theory that support specific skills belongs to certain individuals (Cheng et al., 2021; Erdem & Keklik, 2020; Lubbadeh, 2020; Mahmudi et al., 2019; Rani Gul, 2021).

2. RESEARCH METHOD

2.1 Research Location

The 3D Modeling training location at the Stofo Community in Makassar City is situated in the Laboratory of the Faculty of Arts and Design (FSD) at Makassar State University, South Sulawesi.

2.2 Research Participants

The Stofo Community in Makassar City is the target audience for this community service initiative. The training participants invited are active members of the Stofo community, with the majority being young individuals around 20 years old, totaling approximately 25 people.

2.3 Methodological approach

The method of research is an observation, to collect information about phenomenon to by directly observing during training. This research type of observation will focus on participants' training. This is crucial in addressing the global challenges in the era of the fourth industrial revolution and Society 5.0, the Stofo community, in its training program, employs methods involving Growth Mindset, Training, and Creation. Firstly, there is the development of Growth Mindset in using the 3D Max application for creating comics. Next, there is training in the development of soft skills or 3D Modeling capabilities, conducted through guidance sessions in the FSD computer laboratory. The program concludes with participants creating comic works using the 3D Max application. This is expected to foster the development of skilled human resources ready to face the challenges in the current era of technological advancement.

2.4 Research steps

The stages of 3D Modeling training activities at the Stofo Community begin with preparation, followed by implementation, and conclude with evaluation. The detailed implementation is as follows:

2.5 Preparation

The preparation begins with the development of a training program, training modules, and coordination of the field for practical exercises or laboratories (Makawi et al., n.d.). First, the program development is carried out to ensure that the activities run smoothly and align with the targets. This includes aspects of scheduling, management, and technical considerations. Second, the training modules consist of the training methods that will be provided gradually over the 6-month process, including the types of materials to be covered. The third aspect involves field coordination, particularly related to the location of the service, which will be conducted in the computer laboratory at the Faculty of Social and Political Sciences, UNM.

2.6 Implementation

In the implementation of this 3D Modeling training, a systematic method of understanding, training, and comic creation is applied for the success of this training.

Providing Understanding: Growth Mindset or thought patterns form the basis for human reasoning in performing an activity. In the case of participants in the 3D Modeling training, they will be assigned the task of researching artists who use 3D applications in creating comics. Participants will then have the opportunity to present, discuss, and draw their own conclusions from their findings.

3D Modeling Training Using 3D Max Application: Training is directly guided by an expert in 3D Max, Dr. Aswar, who is a lecturer in Visual Communication Design specializing in animation. Participants will be guided step by step for 6 months on mastering the application. It begins with the introduction of frequently used keyboard shortcuts, followed by training in shaping 3D models useful in creating backgrounds for comics. The training concludes with the rendering process, making 3D objects appear realistic.

Comic Creation: After the training period, participants will be assigned a task that serves as one of the outcomes of this service. Their task is to create a comic background using the 3D Max application. Participants will be guided step by step to achieve optimal results.

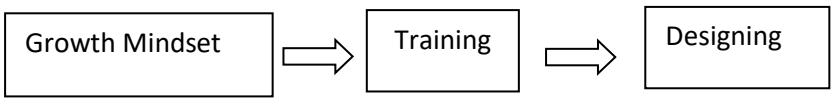

Diagram 2.1 Method of Implementing 3D Modeling Training

2.7 Evaluation

In this stage, two emphasized aspects are monitoring and evaluation. Monitoring is carried out in the form of intensive supervision at each stage to ensure that the implementation proceeds according to the plan. Meanwhile, evaluation is conducted at each stage to ensure that participants can understand each step in creating 3D modeling. In this stage, the description of how and when evaluations are conducted, criteria and indicators of achievement, as well as benchmarks, are included at each stage to declare the success of the implemented program.

3. RESULTS AND DISCUSSION

3.1 Preparation

The preparation for the training is done by providing an introduction and stating the objectives of this service-oriented activity. This ensures that the activity can proceed smoothly, growth mindset is given and well received by the participants. When participants are aware of the goals and the ultimate outcomes to be achieved, the implementation of the activity can bee seen more effective.

3.2 Implementation

Growth Mindset

The research includes emphasizing the importance of using the 3D Max application in modelling, by emphasising growth mindset theory. During this knowledge orientation, students are equipped with knowledge and examples of renowned comic artists worldwide who use 3D modelling applications in creating comics. Furthermore, this stage discusses the significance of using 3D modelling in the era of the 4.0 industrial revolution and Society 5.0.

3D Modelling Research

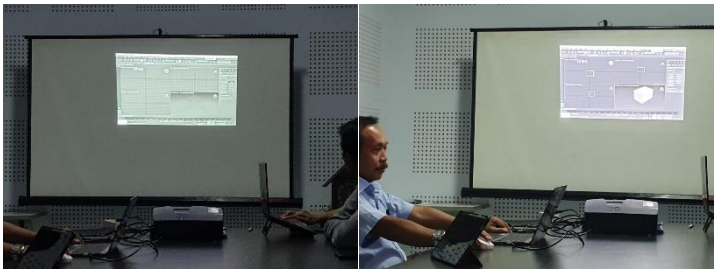

Figure 3.3. 3D Modelling Usage Research (a) introduction to basic 3D Modelling tools (b) examples of creating a simple cube

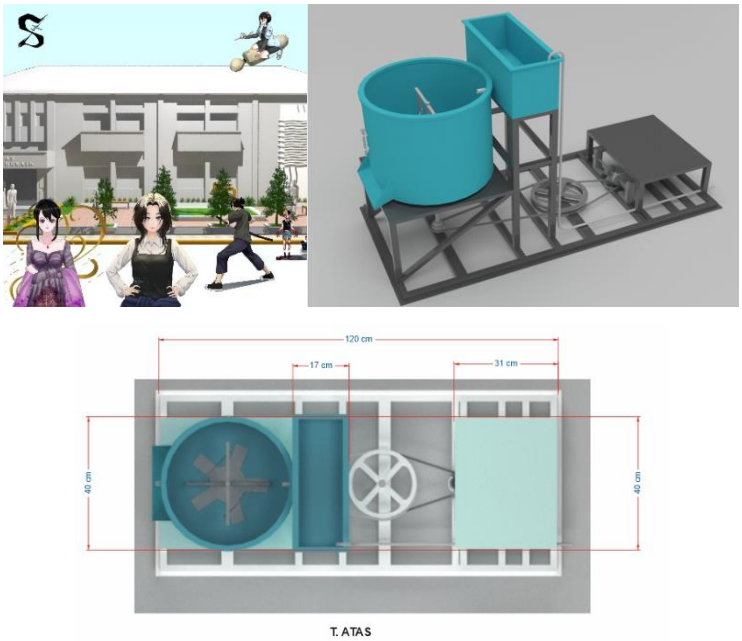

Figure 3.4. Comic Creation with 3D Modelling (a), machine for mixer clay (b), Description of machine from above

3.3 Evaluation

In the evaluation stage, participants from the 20 STOFO community are observed for their level of achievement in this research. The analysis includes the progress made before with basic object and after with complex object creation learning to use 3D Modelling with the 3D Max application, and the results as follow.

Table 3.1. Results of student's expertise in learning 3D model.

Students	Basic Object Creation	Complex Object Creation	Improvement	Level of Expertise
S1	70	90	+20	Next level
S2	80	85	+5	Beginner level
S3	60	65	+5	Beginner level
S4	70	80	+10	Intermedite level
S5	60	75	+15	Next level
S6	55	60	+5	Beginner level
S7	70	85	+15	Next level
S8	50	65	+15	Next level
S9	70	90	+20	Next level
S10	50	60	+10	Intermedite level

S11	65	75	+10	Intermedite level
S12	70	80	+10	Intermedite level
S13	80	90	+10	Intermedite level
S14	75	80	+5	Beginner level
S15	60	65	+5	Beginner level
S16	50	50	+0	Beginner level
S17	60	60	+0	Beginner level
S18	75	80	+5	Beginner level
S19	85	85	+0	Beginner level
S20	60	70	+10	Intermedite level

Based on the results, it can be seen that there are five (5) students with high level of expertise, and six (6) students with intermediate level, and nine (9) students with beginner level. The results shows good results for learning 3D model. As it can be understood that learning 3D model is quite a challenge, and for students with more than 50 percent perform at intermediate level and high level is considered to be very good results.

Discussion

Stofo is a comic community in Makassar that has been established since 2008. Founded by an art education alumnus named Doang, this community has produced many talented comic artists with diverse talents in comic creation, except in the 3D dimension field. Since its establishment, many of its members have pursued professional careers, from starting their drawing studios to working as 2D animators in large start-up companies like Ruang Guru.

In its early days, the community's activities were primarily limited to drawing comics on paper with minimal use of applications like Sai. The lack of application usage that could aid in comic creation has been a common challenge for this thriving community. Considering the community's enthusiasm and the growing number of members since 2008, the potential is significant. Stofo is the only comic community consistently active in Makassar for the past 15 years, making it a remarkable achievement, given the limited and short-lived nature of comic communities in Makassar.

In today's global context, the ability to create comics is increasing, offering significant business opportunities. The sustainability of this community is also supported by its members who have become successful professional comic artists in Indonesia.

Furthermore, Stofo community's vision and mission are to produce individuals with talent in comics, capable of creating appealing and high-quality comics. They regularly share comics they sell at affordable prices with captivating stories and quality. One noticeable weakness in their comic presentation is the lack of detail in the background, which is a common challenge for comic artists. To achieve the vision and mission of producing attractive works with excellent presentation, the inclusion of 3D modelling in their learning vision and mission is essential. Mastering 3D applications will be a valuable asset in the Society 5.0 era.

As a result, the Stofo community possesses a valuable asset in terms of Human Resources (HR). The community has won awards in various artistic fields, including comic competitions and design competitions such as posters and paintings. This achievement is a strong foundation for the community to produce HR ready to establish their comic studios, contributing significantly to the cultural and artistic development of Makassar. In terms of income, the Stofo community has also produced HR capable of working in large companies, with their significant earnings contributing significantly to national taxes.

The ultimate goal of 3D modelling research is to prepare the community members for professional careers with intensive 6-month research. A 6-month duration is sufficient to master 3D modelling, and being guided by an expert, Dr. Aswar, who has been involved with 3D Max for over 20 years, is an advantage in guiding the community effectively. When the students receive intervention by making sense the reasong of studying 3D modelling with growth mindset theory, their performance improve. This is inline to recent

research conducted within the field of growth mindset theory (Gottfredson & Reina, 2021; Naderi & Fathi, 2022; Sahagun et al., 2021).

4. CONCLUSION

The conclusion of this research activity is as follows: first, participants have a very high interest in applying 3D Modelling applications to create comics after receiving growth mindset theory; second, participants can create three-dimensional backgrounds in comics with five (5) at high level, six 6 at intermediate level, and nine (9) at beginner level; third, participants are keen to further develop their skills in using 3D modelling for comics. Therefore, this community service activity has significant benefits in equipping them with knowledge and technical skills in using three-dimensional applications for comic creation. As for recommendations from this research activity, it is advisable for this program to be conducted continuously in the future, enabling participants from the STOFO community to further develop their skills. Additionally, it is essential to ensure that this highly beneficial program, which aligns with the demands of the times, is maximized.

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