Digital Printing Training for Design at Students of SMK Budi Karya Natar

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Abstract– The presence of technology in our lives if used positively, actually brings many benefits. No exception to support and maximize a business. Following the rapid development of digital, business competition is getting tougher. Figma is one of the design tools and the advantage of Figma is web based. Illustrations on the figma are created with basic shapes and editing tools available. We can use the edit object to manipulate the nodes as needed. The purpose of the PKM activity entitled introduction to design technology and 3D printing is to provide knowledge to students and teachers about design technology and 3D printing technology and the benefits obtained in the use of design technology and 3D printing. From the results of the questionnaire, knowledge about 3D Printing technology that was distributed before the activity and after the activity there was an increase in student and teacher knowledge about 3D Printing technology from those who knew 50% before the PKM activity, after this activity increased to 100% knowing about 3D Printing technology.

Keywords: 3D Printing; Design; Digital; Figma; Technology

1. INTRODUCING

Today's technology is able to create a more modern and sophisticated storage system, so that it can protect important data of a business or company. It is proved that not always technology plunges(Kaleb, 2019). The presence of technology in our lives if used positively, actually brings many benefits. No exception to support and maximize a business. Following the rapid development of digital, business competition is getting tougher. This means that entrepreneurs must be able to find the best way so that their business can survive and not be displaced by fierce competition(Damayanti et al., 2020).

Conditions like this provide opportunities for the world of education to use computers and information technology (IT) as a good means to improve the quality or quality of teaching and learning in schools. The advantages in the application of information technology in the world of education include that the information needed will be faster and easier to access for educational purposes, innovation in learning is growing with the existence of e-learning innovations that make the educational process easier, ICT advances will also allow the development of virtual classes or teleconference-based classes that do not require the educator and students to be in one room. One example of technology that can be utilized in the world of education(Ahdan & Setiawansyah, 2021; Kurniawan et al., 2020; Setiawansyah et al., 2021).

The rapid development of 3D printer technology gave birth to so many three-dimensional object printing techniques. In addition to SLAs and SLS, there are no less or so 10 other techniques used in 3D printers to date. The material used is also not limited to photopolymers, depending on the purpose for which the three-dimensional object is created. Currently, the use of 3D printers includes many things, some of which are in the fields of medicine, manufacturing, art, and so on. Some of the advantages of using a 3D printer include: it is cheaper and more effective in producing prototypes of an industrial product, can be produced on a small scale or even units (customize), and is able to produce more detailed and complex products.

Figma is one of the design tools and the advantage of Figma is web based. Illustrations on the figma are created with basic shapes and editing tools available. We can use the edit object to manipulate the nodes as needed. There are multiple selection tools that can be used to cut shapes and create new shapes. In addition, we can also create a pattern and then use it for the pattern fill. After understanding the pattern, we can try folk art, by combining abstract patterns and line art.

The main features that Figma excels in are cloud-based software, support for browsers and desktops, Provides features for collaboration in real time, has the Figma Mirror feature, which is a tool that allows you to be able to see the designs you have made on your desktop through various Android devices. When making design changes on the desktop, the display on the Android screen will be updated in real time. Some of the advantages possessed by Figma are that collaboration can be done in real time with good transparency making it easier for the design team to be able to work together, Having features for quick and easy file sharing, This design tool is cloud-based so you don't need to manually store designs on a computer. The design also becomes easier to access anywhere, Figma supports a wide variety of plugins. Designers can use a variety of plugins to add Figma functionality.

The purpose of the PKM activity entitled introduction to design technology and 3D printing is to provide knowledge to students and teachers about design technology and 3D printing technology and the benefits obtained in the use of design technology and 3D printing.

2. IMPLEMETATION METHOD

The stages in the implementation of community service activities carried out by the Lecturer Team of the Universitas Teknokrat Indonesia are as shown in Figure 1 below.

Figure 1. Stages of Activity Implementation

The explanation of the stages of implementing this activity is
a. Starting from the initial stage, namely having a discussion with the Principal about 3D printing activities that will be taught to students and teachers. This activity will teach the basic techniques of 3D printing design and printing.
b. In the implementation stage, this activity carried out UI / UX design activities for industrial products using FIGMA and 3d printing technology which was held on October 26, 2022 at SMK Budi Karya Natar, South Lampung. This activity was carried out in the classroom and the target participants were 35 students of class XII SMK Budi Karya Natar and 15 teachers.
c. This evaluation stage, the PKM team evaluates activities by distributing questionnaires to students about UI / UX design activities for industrial products using FIGMA and 3d printing technology. The results of the evaluation are the consideration of the PKM team in providing knowledge about UI / UX design activities for industrial products using FIGMA and 3d printing technology to students and teachers, so that in the future they can carry out even better.

3. RESULT DAN DISCUSSION

Lecturers at the Universitas Teknokrat Indonesia for the umpteenth time held a community service program (PKM). This time the activity was held at SMK Budi Karya, Natar, South Lampung. This event was titled Introduction to the Metaverse which was attended by approximately 35 class XII students and 15 subject teachers participating in this activity. The purpose of this activity is to facilitate the learning process in terms of visualizing a certain

material, so as to increase students interest in learning in terms of utilizing metaverse technology as a learning medium.

3.1 Activity Explanation

3D Printing is a process of creating three-dimensional objects from a CAD (computer-aided design) model, usually by adding layer-by-layer printing material. Generally, 3D printing uses a material extrusion technique called Fused Deposition Modeling (FDM). To be able to produce good 3D objects, it requires mastery of how machines work, knowledge of the nature of plastic materials and strategies in compiling and designing. The materials provided in this activity include

a. Vat Photopolymerization
b. Material Jetting
c. Binder Jetting
d. Powder bed fusion
e. Directed Energy Deposition
f. Sheet lamination

3.2 Level of Understanding of Ongoing Activities

Before and after the implementation of this community service activity, the PKM team disseminated a questionnaire of knowledge about 3D Printing technology that will be given. Comparison questionnaire results after and before the activity as shown in Figure 2 below.

Figure 2. Comparison Chart on the Introduction of 3D Printing

From the results of the questionnaire, knowledge about 3D Printing technology that was distributed before the activity and after the activity there was an increase in student and teacher knowledge about 3D Printing technology from those who knew 50% before the PKM activity, after this activity increased to 100% knowing about 3D Printing technology.

3.3 Activity Documentation

This digital printinf training activity was carried out at SMK Budi Karya Natar on October 26, 2022, the purpose of this material is the introduction of 3D printing technology in order to build

an entrepreneurial spirit for students of SMK Budi Karya Natar. The following is documentation of activities as in Figures 3 and 4.

Figure 3. Introduction to 3D Printing Technology

Introduction to designing UI/UX design for industrial products using FIGMA and 3d printing technology presented by the speaker, namely Mr. Qadhli Jafar Adrian, M.I.T., and Mr. Auliya Rahman Isnain, S.Kom., M.Cs. explained about the benefits of to design UI/UX design for industrial products using FIGMA and 3D printing technology to students of SMK Budi Karya Natar.

Figure 4. Students Create 3D Printing Designs

The students enthusiastically tried to design UI / UX design for industrial products using FIGMA and 3d printing technology in community service activities carried out by Lecturers of the Faculty of Engineering and Computer Science, University Teknokrat Indonesia.

4. CONCLUSION

Conditions like this provide opportunities for the world of education to use computers and information technology (IT) as a good means to improve the quality or quality of teaching and learning in schools. In the implementation stage, this activity carried out UI / UX design activities for industrial products using FIGMA and 3d printing technology which was held on October 26, 2022 at SMK Budi Karya Natar, South Lampung. This activity was carried out in the classroom

and the target participants were 35 students of class XII SMK Budi Karya Natar and 15 teachers. From the results of the questionnaire, knowledge about 3D Printing technology that was distributed before the activity and after the activity there was an increase in student and teacher knowledge about 3D Printing technology from those who knew 50% before the PKM activity, after this activity increased to 100% knowing about 3D Printing technology.

REFERENCES

Ahdan, S., & Setiawansyah, S. (2021). Android-Based Geolocation Technology on a Blood Donation System (BDS) Using the Dijkstra Algorithm. *IJAIT (International Journal of Applied Information Technology)*, 1–15.

Damayanti, D., Megawaty, D. A., Rio, M. G., Rubiyah, R., Yanto, R., & Nurwanti, I. (2020). Analisis Interaksi Sosial Terhadap Pengalaman Pengguna Untuk Loyalitas Dalam Bermain Game. *JSI: Jurnal Sistem Informasi (E-Journal)*, *12*(2).

Kaleb, B. J. (2019). Penerapan Sistem Informasi Manajemen Dan Pengawasannya Di Kantor Pelayanan Pajak Pratama Manado. *Jurnal EMBA: Jurnal Riset Ekonomi, Manajemen, Bisnis Dan Akuntansi*, *7*(1), 781–790. https://doi.org/10.35794/emba.v7i1.22555

Kurniawan, I., Setiawansyah, & Nuralia. (2020). PEMANFAATAN TEKNOLOGI AUGMENTED REALITY UNTUK PENGENALAN PAHLAWAN INDONESIA DENGAN MARKER. *Jurnal Informatika Dan Rekayasa Perangkat Lunak*, *1*(1), 9–16.

Setiawansyah, S., Parjito, P., Megawaty, D. A., Nuralia, N., & Rahmanto, Y. (2021). Implementation of The Framework for The Application of System Thinking for School Financial Information Systems. *Tech-E*, *5*(1), 1–10.