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Autodesk Inventor Instruction for Technical Drawing Teachers in High School/Vocational Schools

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Abstract

The objective of this training is to enhance the proficiency of high school/vocational high school teachers in the creation of technical drawings using Autodesk Inventor, a software that is utilized for 3D modeling, structural strength simulation, motion animation, and other engineering analyses. The Faculty of Engineering, Darma Persada University conducted this training on February, both online and offline. The training method encompasses theory, direct practice, and evaluation through pre-tests and post-tests. The results of the training demonstrated a decrease in the teachers' comprehension of the fundamental concepts and the application of Autodesk Inventor in engineering education. The documentation and evaluation of this program can serve as a reference for the development of similar training in the future.

Keywords*: Autodesk Inventor, Engineering Drawing, 3D Modeling, Teacher Training*

1. INTRODUCTION

Technical drawings play an important role in the world of engineering and technology because they function as a universal language of communication. In the digital era, the use of Computer-Aided Design (CAD) software such as Autodesk Inventor is increasingly needed to improve efficiency and accuracy in the Engineering design process [1]. Autodesk Inventor has various superior features, such as parametric modeling, simulation, and structural analysis that support the needs of the manufacturing and mechanical engineering industries [2].

Along with the development of industry 4.0, vocational education at the high school/vocational school level must be able to adapt to the latest technology. Teachers as learning facilitators need to have competence in using engineering design software in order to be able to provide material that is relevant to current industry needs [3]. Therefore, this training is designed to improve teachers' skills in using Autodesk Inventor to support technical drawing teaching.

This training covers a basic introduction to Autodesk Inventor, 3D modeling techniques, component assembly (.IAM), creation of working drawings (.IDW/.DWG), as well as creation of Bill of Material (BOM) and Bill of Quantity (BOQ). The material presented is expected to provide participants with broader insight into Autodesk Inventor applications in various industrial sectors, including product design and manufacturing [4].

With this training, it is expected that high school/vocational school teachers can better understand and implement Autodesk Inventor in classroom learning. The documentation and tutorials available in this training can also be a source of independent learning for participants to continue developing their skills in the field of engineering design [5].

2. METHODOLOGY

The training was administered online, and a diverse array of organizations, including high school and vocational school teachers in the Jakarta area, observed and participated in the service. This method ensured the accessibility and convenience of educators, thereby facilitating their effective engagement with the material. At the commencement of the session, a pre-test

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was administered to evaluate the instructors' initial understanding of AI tools. The purpose of this assessment was to assess their current knowledge and identify areas that required further clarification. The structured evaluation established a standard for evaluating the training's effectiveness. At the conclusion of the session, the participants were given a post-test to assess their comprehension of the material following the training. This evaluation served as a comparative measure to determine the extent to which their understanding of AI tools had improved. The post-test results illustrated the extent to which the training enhanced their knowledge and capabilities. The critical components of AI applications in education were evaluated through the queries used in both the pre-test and post-test. Figure 1 illustrates these assessment queries, providing a look into the training methodology and its impact on the participants' learning outcomes.

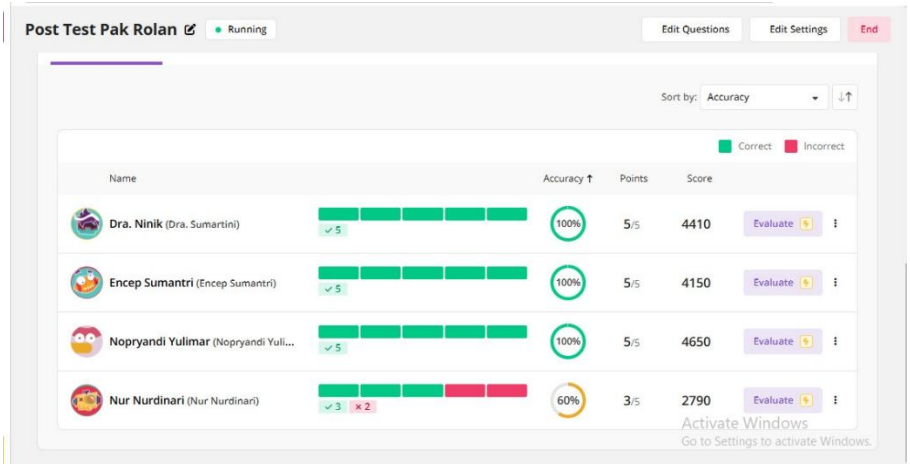

Figure 1. Post test result

3. RESULT AND DISCUSSION

Figure 2 illustrates the event's diverse activities and participant documentation. These activities encompass the delivery of materials by the presenters, interactive question-and-answer sessions, and the participation of participants in practice inquiries during the post-test. Furthermore, a group photo session was arranged to commemorate the occasion. The documentation functions as evidence of active engagement and participation throughout the program. By illustrating these events, the documentation emphasizes the collaborative efforts and learning process of the participants. It also serves as a valuable record for future reference and evaluation, ensuring that the event's impact can be effectively evaluated.

Figure 2. *Training Activity*

The objective of this publication is to improve the public's understanding of the activities that have been conducted. Furthermore, this upload functions as a resource for individuals who require pertinent information. The objective of this documentation is to ensure that the results of the activity are disseminated effectively and are beneficial to a broader audience.

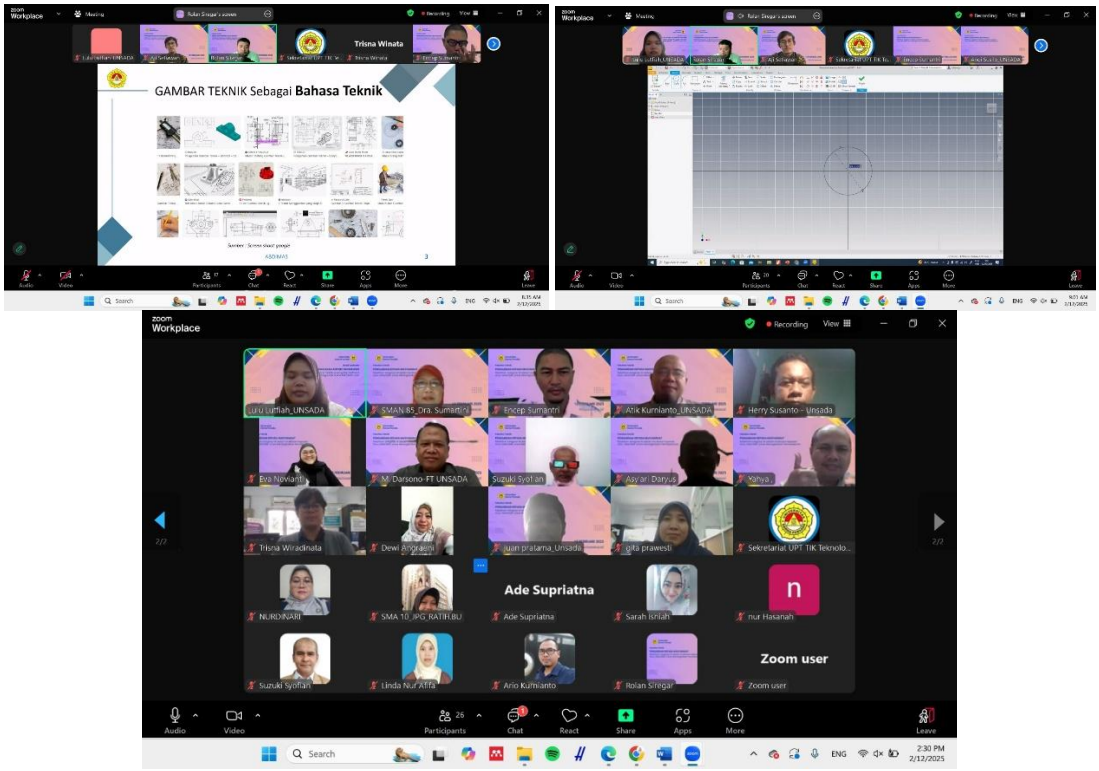

Figure 3. Participant Attendance

4. CONCLUSION

By offering participants a thorough comprehension of community service initiatives, they have been successfully implemented online. The goal of this event is to enhance the community's intelligence and capabilities in pertinent areas. Through interactive and informative delivery methods, participants are capable of readily understanding the material that is presented. Furthermore, in order to enhance its effectiveness and appeal, this activity is supplemented with a diverse array of educational media. The objective of this activity is to facilitate the community's utilization of the knowledge they have acquired in their daily lives. A reference and evaluation for subsequent activities has also been prepared, which includes documentation of this activity.

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