DOI: 10.70491/jep.v2i2.70

Engineering Drawing Training for High School/Vocational School Teachers in Jakarta Using AUTOCAD MECHANICAL

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Abstract

The primary objective of this community service initiative is to provide training to high school and vocational school instructors in Jakarta on the use of AutoCAD Mechanical for engineering drawing. AutoCAD Mechanical offers sophisticated automation features and tools to enhance the accuracy and productivity of technical drawings. The training was conducted online, which enabled a wide range of participants to participate. The methodology comprised a pre-test to evaluate initial knowledge, interactive sessions to convey material, and a post-test to evaluate learning outcomes. The training was attended by a total of 33 participants. The findings suggest that the majority of participants developed a more comprehensive comprehension of the ethical implications and precision of AI-based tools. The discussion emphasizes the efficacy of online training in improving the understanding of AutoCAD Mechanical among instructors. For future enhancements and future reference, documentation was maintained, which encompassed participant engagement and training activities. This activity enhances the proficiency of educators in the utilization of digital tools for the purpose of mechanical engineering education.

Keywords*: AutoCAD Mechanical, engineering drawing, AI-based tools*

1. INTRODUCTION

AutoCAD Mechanical is a computer-based design software that is specifically intended for mechanical engineering applications [1]. This software offers a diverse array of tools and features that facilitate the efficient processing of manufacturing data, the design of mechanical components, and the creation of engineering drawings [2]. In comparison to the standard version of AutoCAD, AutoCAD Mechanical offers supplementary features that facilitate the creation of technical drawings for engineers. These features include standard element libraries, dimension automation tools, and design analysis capabilities.

The utilization of AutoCAD Mechanical is crucial in the industrial sector to enhance the accuracy and productivity of the design process [3][4]. This instrument assists engineers in the development of engineering drawings that adhere to international standards, including ISO, ANSI, and DIN. This tool's automation capabilities and intelligent features enable it to expedite the product design cycle and minimize human errors. [5].

This service offers a comprehensive comprehension of the application of AutoCAD Mechanical in the creation of engineering drawings, particularly for high school and vocational school instructors, as a supplementary scientific perspective. The material presented encompasses the fundamental concepts of AutoCAD Mechanical, drawing techniques, display settings, and the application of special features to create mechanical components in accordance with the teaching flow in drawing. Mechanical Engineering [6]. Through this learning process, users can enhance their abilities in utilizing this software to facilitate their work in the field of mechanical engineering.

This activity provides high school and vocational high school mechanical engineering instructors with a more comprehensive understanding of the application of AutoCAD Mechanical in the industrial sector. The exercises and case examples that are included will assist users in comprehending the practical applications of this software.

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2. METHODOLOGY

Various groups, including high school and vocational school teachers in the Jakarta area, were able to observe the service, as it was conducted online. The instructors' preliminary comprehension of AI tools was assessed through a pre-test that initiated this activity. Participants were administered a post-test at the conclusion of the training to assess their comprehension following this session. The questions utilized in the pre-test and post-test are illustrated in Figure 1.

PRE TEST & POST TEST

1. Gambar Teknik merupakan sarana komunikasi bagi para *engineer* di seluruh dunia. Apakah pernyataan tersebut benar atau salah?
   a. Benar
   b. Salah
2. AutoCAD Mechanical adalah software untuk membuat gambar teknik yang paling banyak dipakai oleh *engineer* di seluruh dunia. Apakah pernyataan tersebut benar atau salah?
   a. Benar
   b. Salah
3. Saat ini software AutoCAD Mechanical sudah tidak sesuai lagi untuk digunakan dalam pembuatan gambar teknik. Apakah pernyataan tersebut benar atau salah?
   a. Benar
   b. Salah
4. Walaupun saat ini banyak bermunculan software design 3D, tapi para *engineer* tetap masih banyak yang menggunakan software AutoCAD Mechanical sebagai alat bantu desain gambar teknik. Apakah pernyataan tersebut benar atau salah?
   a. Benar
   b. Salah
5. Salah satu penyebab banyaknya pengguna software AutoCAD Mechanical sebagai alat bantu pembuatan gambar teknik adalah tersedianya secara lengkap fitur-fitur pendukung pembuatan gambar teknik pada software AutoCAD Mechanical yang sangat memudahkan dan mempercepat pembuatan gambar teknik. Menurut anda apakah pernyataan tersebut benar atau salah?
   a. Benar
   b. Salah

Figure 1. Pre Test and Post Test

3. RESULT AND DISCUSSION

Community service is an endeavor that aims to disseminate science, technology, and art to the community. The occasion, which was observed by 33 individuals, was successful. The Post-test enabled the majority of participants to understand the importance of ethically employing artificial intelligence-based tools. They were able to confirm the accuracy and reliability of the instruments' output. The post-test results, as depicted in Figure 2, evaluated the participants' understanding of the material that had been presented.

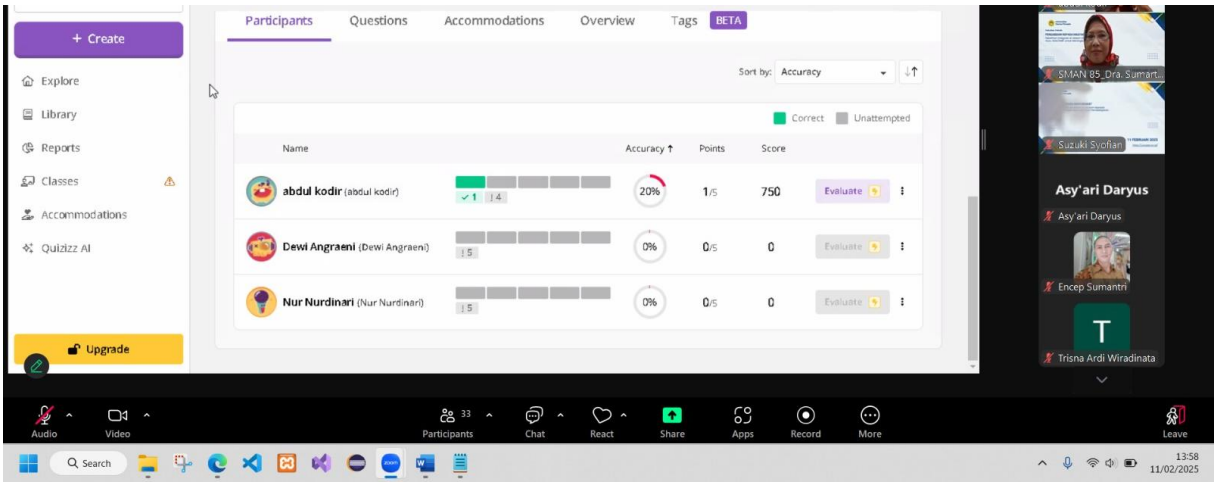

Figure 2. Post Test Result

The documentation of participants and the diverse activities that were conducted during the event is depicted in Figure 3. These activities include the participation of participants in

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practice queries during the post-test, interactive question-and-answer sessions, and the delivery of materials by the presenters. Additionally, a group photo session was organized to commemorate the event. The documentation serves as evidence of active engagement and participation throughout the program. The documentation highlights the learning process and collaborative efforts of the participants by illustrating these events. It also functions as a valuable record for future reference and evaluation, ensuring that the event's impact can be effectively assessed.

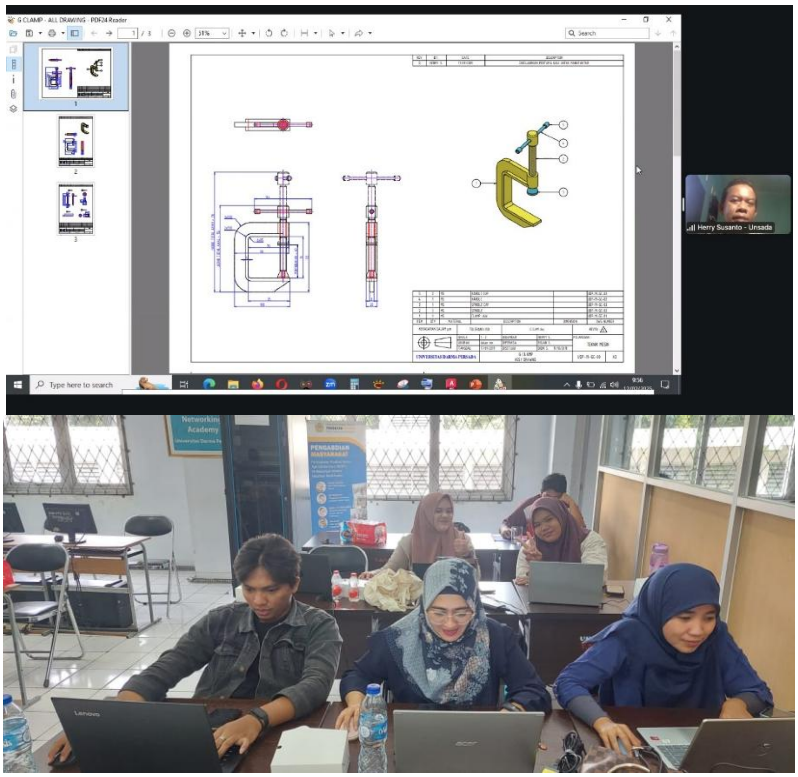

Figure 3. *Activity*

The purpose of this publication is to enhance the public's comprehension of the activities that have been conducted. Additionally, this upload serves as a reference for parties in need of relevant information. The purpose of this documentation is to guarantee that the activity's results are effectively disseminated and that they are beneficial to a broader audience.

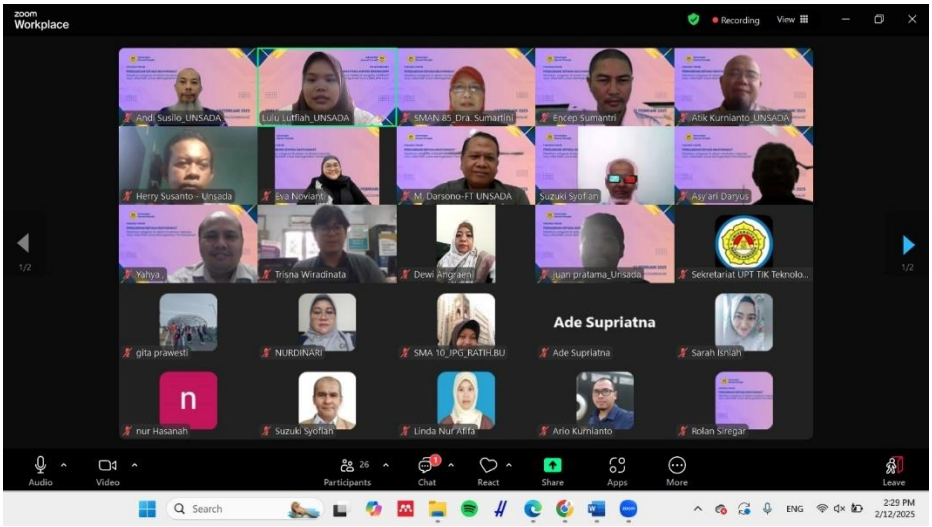

Figure 4. Participant Attendance

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4. CONCLUSION

They have been effectively implemented online by providing participants with a comprehensive understanding of community service activities. The objective of this event is to improve the community's intelligence and capabilities in relevant fields. Through interactive and informative delivery methods, participants are able to easily comprehend the material that is presented. Additionally, this activity is supplemented with a variety of educational media to improve its effectiveness and appeal. The purpose of this activity is to enable the community to apply 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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