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Advanced AutoCAD training for vocational high school teachers and laboratory assistants

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ABSTRACT

This community service program is carried out as drawing training using Advanced AutoCAD for teachers and laboratory assistants at a vocational high school in Serang Regency, namely SMK YP Fatahillah 1 Kramatwatu. This program is carried out to improve vocational students' ability and readiness in the world of work and industry. The training materials provided in this training are introductions, drawings, sketches, modifications, and 3D AutoCAD. This training activity is implemented using the method of presentation, tutorial, practice, discussion, question and answer, and exercises. The results of the training showed an increase in the ability of participants in the introduction of the AutoCAD application. The achievements of the activities in this training were realized by the results of the participants' work after the training.

ABSTRAK

Program pengabdian kepada masyarakat ini dilakukan dalam bentuk pelatihan menggambar menggunakan Advanced AutoCAD pada guru dan laboran di salah satu sekolah menengah kejuruan di Kabupaten Serang, yaitu SMK YP Fatahillah 1 Kramatwatu. Program ini dilakukan untuk meningkatkan kemampuan dan kesiapan siswa SMK dalam menghadapi dunia kerja dan industri. Materi pelatihan yang diberikan pada pelatihan ini yaitu tentang *introductions*, *drawing*, *sketch*, *modify* dan 3D AutoCAD. Pelaksanaan kegiatan pelatihan ini dilakukan dengan metode presentasi, tutorial, praktik, diskusi, tanya jawab, dan latihan. Hasil pelatihan didapatkan peningkatan kemampuan peserta dalam pengenalan aplikasi AutoCAD. Capaian kegiatan pada pelatihan ini diwujudkan dengan hasil kerja para peserta setelah pelatihan.

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1. Introduction

AutoCAD is essential software that vocational students must master. The benefit of studying AutoCAD is to increase self-competence in industrial competition. AutoCAD training has been carried out a lot at the school level, one of which is in vocational schools [1]. Training on using this software is needed to introduce the basics of some of the more sophisticated software in the industry later [2-3]. In addition, this training aims to improve the competency of vocational students [4-8]. Apart from students, this software is also essential for teachers, youth organizations, and the community to learn [9-11]. Due to the urgency, this software training continues to be implemented to improve student competence even during the Covid-19 Pandemic [12-14].

Banten Province has many local, national, and international industries. Industries in the province of Banten are growing rapidly, especially in the cities of Tangerang, Serang, and Cilegon. Universitas Sultan Ageng Tirtayasa is one of the universities in Banten Province. Prominent national and international scale industries surround the campus. The Department of Mechanical Engineering, Faculty of Engineering, Universitas Sultan Ageng Tirtayasa, wants to take part in caring for others, one of which is vocational high school education. Vocational High School (SMK) YP Fatahillah 1 Kramatwatu is a private

vocational high school in Serang Regency, Banten Province. This vocational school is near Campus B Untirta Cilegon, where the Department of Mechanical Engineering is.

The results of interviews with the service program implementing team with the deputy principal for curriculum affairs at SMK YP Fatahillah 1 Kramatwatu obtained information that the AutoCAD application owned by the school had not been appropriately implemented, thus affecting the ability and mastery of the AutoCAD application from teachers and laboratory assistants. These conditions impact the knowledge of SMK YP Fatahillah 1 Kramatwatu students in preparing for the skills competency exam as a graduation requirement and facing the world of work. Based on these problems, it is necessary to have a service program in the form of Advanced AutoCAD training to improve the ability and readiness of educators and laboratory assistants at SMK YP Fatahillah 1 Kramatwatu in facing exams as well as the world of work and industry.

2. Method

The stages used in this service program start with a preliminary analysis of the importance of mastering AutoCAD applications in the industrial sector. The initial analysis found that the importance of mastery of teachers and laboratory assistants is related to knowledge of computational software, namely AutoCAD and AnSys. Based on this, the team observed several vocational high schools around Campus B Untirta.

From several observations, it was decided to conduct community service activities at SMK YP Fatahillah 1 Kramatwatu. Furthermore, the service team and the school discussed the service program. The discussion resulted in the implementation of a community service program in the form of Advanced AutoCAD training. The next stage is the preparation of the committee and training modules by the service team. After the activity, a program evaluation is carried out and ends with reporting on the service program.

The theme of the activities in this service program is "Improving the capabilities and readiness of vocational high schools in facing the world of work and industry." The nature of this activity was carried out offline by inviting representatives of SMK YP Fatahillah 1 Kramatwatu teachers to the laboratory of the Department of Mechanical Engineering, Faculty of Engineering, Universitas Sultan Ageng Tirtayasa. This program aims to improve the ability of vocational school educators and education staff to use the AutoCAD application to prepare students for the world of work and industry.

This community service activity is held from Monday to Wednesday, from 28th to 30 March 2022, from 08.00 AM to. 4.00 PM. This service program activity is at the Mechanical Engineering Department Laboratory, Faculty of Engineering, Campus B Untirta. The committee for this community service activity comprises lecturers, academic staff, and Department of Mechanical Engineering Untirta students. The students involved were laboratory assistants and the Mechanical Engineering Student Association (HMM). The participants were teachers and laboratory assistants from SMK YP Fatahillah 1 Kramatwatu. The AutoCAD training contains material, namely: introductions, drawings, sketches, modifications, and 3D AutoCAD.

3. Results and Discussion

The implementation of this service activity program began on March 28, 2022, and took place in the Auditorium Room on the 2nd Floor of the Dean's Building, Faculty of Engineering, Untirta. Lecturers and students at the Untirta Faculty of Engineering attended the opening activity. In addition, this activity was also attended by teachers and laboratory assistants from SMK YP Fatahillah 1 Kramatwatu. This activity was filled by presenters from representatives from the Untirta Mechanical Engineering lecturers and speakers who understand the AutoCAD program with AutoCAD introductory material and a glimpse of the use of AutoCAD in the industrial sector. The documentation of the workshop activities is presented in Figure 1. The material was presented by lecturers of Mechanical Engineering, FT Untirta, and assisted by assistants from the Machine Drawing Laboratory, Faculty of Engineering, Untirta. The modules used in this training discuss introductions, drawing, sketch, modify, and 3D AutoCAD.

a  b 

Figure 1. (a) Documentation of lecturer and teacher representatives; (b) Greetings from teacher representatives.

The training activities were held in the Technical Drawing Laboratory Room, Department of Mechanical Engineering, FT Untirta, for three days, from 28 to 30 March 2022. The participants in this training activity were ten teachers and laboratory assistants from SMK YP Fatahillah 1 Kramatwatu. Implementation of activities carried out under the schedule and training materials. Documentation of the implementation of activities from day 1 to day three is presented in Figure 2, Figure 3, and Figure 4, respectively.

a

b

Figure 2. First day of Advanced AutoCAD service training activities.

a

b

Figure 3. Second day of Advanced AutoCAD service training activities.

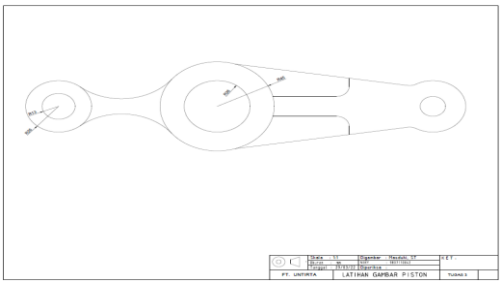
a

b

Figure 4. Third day of Advanced AutoCAD service training activities.

This training activity was implemented using the presentation and tutorial method carried out by the presenters. In addition, the presenters also practice directly and are followed by the participants. Interaction is implemented by providing space and time for participants to carry out discussions, questions, and answers directly with the speakers. Several assistants from the Machine Drawing Laboratory accompany the practical implementation. The presenter also provides an exercise that the participants must do.

The results of the training showed an increase in the ability of participants in the introduction of the AutoCAD application. The results can be seen from the knowledge of participants who have never known the AutoCAD application to be able to carry out the practices and exercises that the presenters have given. The achievements in the workshops and training program for the advanced AutoCAD application service are manifested in the participants' work results after the training. The results of the work of, the participants are expected to be able to master all the modules that have been given by the speaker properly. Some of the participants' work results are presented in Figure 5 and Figure 6.



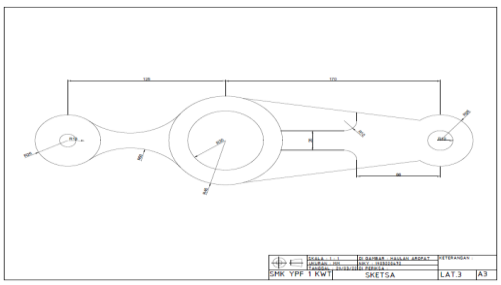


Figure 5. The results of the training participants' work using the Advanced AutoCAD model 1.

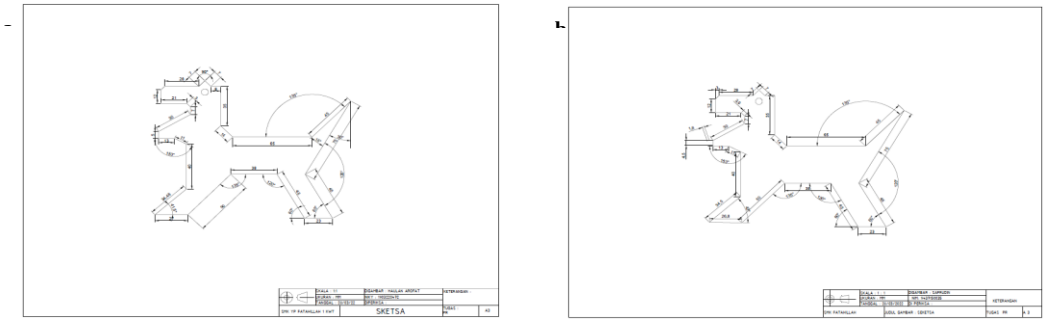


Figure 6. The results of the training participants' work using the Advanced AutoCAD model 2.

Several evaluations of activities in the workshop service program and advanced AutoCAD application training, including from the committee, modules, and conducting training. The drawback of this activity is the need for coordination and preparation between committees in preparing for implementing activities. In subsequent service activities, it is hoped that all committees will be more prepared and mature in carrying out activities. The modules provided still need to be done in printed form that can be used by trainees to be used in the teaching and learning process with students in class. The module is still limited and not for publication or trading in general. The module should be improved so trainees can use it in the teaching and learning process with students in class. Several participants in this training still needed to familiarize themselves with the menus contained in the AutoCAD application. Some of the participants' work results were varied and imperfect in carrying out the tasks given.

a

b

c

d

e

f

Figure 7. (a) Greeting by the school principal, (b) Distribution of certificates to participants, (c) Giving souvenirs by the committee, (d) Giving souvenirs by the school principal, (d) Giving souvenirs in the form of certificates for schools, (f) Documentation of participants and committee.

This service program was closed on the 3rd day by giving souvenirs from the committee and SMK YP Fatahillah 1 Kramatwatu representative. At the closing ceremony, participants were also given certificates for activities. The closing documentation is presented in Figure 7. In the closing and presentation sessions, time was given for the representatives of the participants and the school principal to convey several opinions and input to the committee. The Principal is very grateful for the training and hopes the collaboration will continue.

4. Conclusion

This service program is carried out as drawing training using Advanced AutoCAD with partners, namely SMK YP Fatahillah 1 Kramatwatu. The result of this training is an increase in the ability of participants to use Advance AutoCAD, including being able to carry out the practices and exercises given by the presenters. The achievements of the activities in this training were manifested in the work results of the participants after the training was carried out. The output of this activity is the creation of modules and training activities. Through this activity, the Department of Mechanical Engineering, Faculty of Engineering, Universitas Sultan Ageng Tirtayasa wants to advance vocational education in Serang Regency.

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