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Improving the 2D drawing soft skills of Banten Province vocational high school teachers and laboratory assistants through workshops and training

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ABSTRACT

A community service program in the form of workshops and soft skills training in the form of 2D drawing skills for teachers and laboratory assistants at Vocational High Schools (SMK) in Banten Province has been implemented. This activity is in partnership with SMK YP Fatahillah 1 Cilegon. This program is implemented to improve the ability of educators to help students face the world of work and industry after they graduate. The application used in this workshop and training is the AutoCAD application. The training material is about an introduction to AutoCAD, drawing simple 2D objects and complex 2D objects. Participants in this training activity consisted of teachers and laboratory assistants. This training activity uses presentation methods, tutorials, practice, discussions, questions and answers, and exercises. The training results showed increased participants' soft skills in 2D drawing using the AutoCAD application.

ABSTRAK

Program pengabdian kepada masyarakat dalam bentuk workshop dan pelatihan softskill berupa keterampilan menggambar 2D pada guru dan laboran di Sekolah Menengah Kejuruan (SMK) di Provinsi Banten telah dilaksanakan. Kegiatan ini bermitra dengan SMK YP Fatahillah 1 Cilegon. Program ini dilaksanakan untuk meningkatkan kemampuan para pendidik untuk membantu peserta didik dalam menghadapi dunia kerja dan industri setelah mereka lulus. Aplikasi yang digunakan pada workshop dan pelatihan ini yaitu dengan menggunakan aplikasi AutoCAD. Materi pelatihan yang diberikan yaitu tentang pengantar AutoCAD, menggambar objek 2D sederhana dan menggambar objek 2D kompleks. Peserta kegiatan pelatihan ini terdiri dari guru dan laboran. Pelaksanaan kegiatan pelatihan ini dilakukan dengan metode presentasi, tutorial, praktik, diskusi, tanya jawab, dan latihan. Hasil pelatihan didapatkan peningkatan kemampuan softskill para peserta dalam drawing-2D dengan menggunakan aplikasi AutoCAD.

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1. Introduction

Improving soft skills in the form of drawing skills among teachers and laboratory assistants at Vocational High Schools (SMK) in Banten Province needs to be implemented. Increasing these soft skills is required to support improving educators' ability to help students face the world of work and industry after they graduate. In implementing learning at Vocational High Schools (SMK), there is a Skills Competency Test (SCT) as an indicator of the achievement of graduate competency standards as stated in Minister of National Education Regulation Number 34 of 2018 concerning Competency Standards and Basic Vocational Competencies.

As stated in the SCT implementation guidelines, the form of SCT consists of a Vocational Theory Examination, a Vocational Practical Examination in the form of a project/assignment, and a Vocational Practical Examination in the form of a certification scheme. The Skills Competency Test at Vocational Schools, especially in Mechanical Engineering, includes testing on Mechanical Drawing Techniques. In this SCT, students see their theoretical and practical abilities in drawing machines manually or using several applications.



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Banten Province has many local, national, and international industries. Industries in Banten Province are increasing, especially in the cities of Tangerang, Serang, and Cilegon, so qualified experts ready to work with skills that must be prepared beforehand are needed. Vocational school graduates in Banten Province are expected to have soft and hard skills prepared for the world of work. One of the soft skills that mechanical engineering vocational school graduates must have is soft skills in technical drawing.

The Department of Mechanical Engineering, Faculty of Engineering, Sultan Ageng Tirtayasa University (FT Untirta) is located at KM. 3 Cilegon City, Banten Province. Major domestic and international industries surround this campus. As a form of community service, the Faculty of Mechanical Engineering FT Untirta cares for others, including the world of education. YP Fatahillah 1 Cilegon Vocational High School (SMK) is a private vocational school in Cilegon City, Banten Province. This vocational school is located near Campus B Untirta Cilegon, where the FT Untirta mechanical engineering department is. After directly observing the location of the incident and interviewing school leaders, information was obtained on the need to improve the soft skills of teachers and laboratory staff, especially technical drawing skills. One of the soft skills required is an in-depth ability to draw 2D using the AutoCAD application.

Many AutoCAD application workshops and training have been held at the school level, including seminars at vocational schools [1-2]. Training on using this application is needed to introduce several applications in the industrial sector later [3-4]. In addition, this application training program is also used to improve students' skills in vocational schools [5-9]. Apart from students, this application also provides workshops and training for teachers, youth organizations, and communities [10-12]. Because of the importance of this application, when the COVID-19 pandemic hit Indonesia, several trainings on this application continued to be offered to improve students' skills [13-15]. Based on the information obtained, a community service program was implemented in the form of workshops and drawing soft skills training to increase the capacity and preparation of lecturers and laboratory assistants by SMK YP Fatahillah 1 Cilegon to face the world of work and the industrial world.

2. Method

The methodology used in this service program includes holding workshops and continuing intensive training in the computer laboratory. The delivery method is face-to-face/lecture given by a resource person from a lecturer at the Department of Mechanical Engineering, Untirta, and accompanied by an assistant from the Technical Drawing Laboratory, Department of Mechanical Engineering, Untirta. This training was previously made into the AutoCAD Software Engineering Drawing Practical Module. The training material includes an introduction to AutoCAD, drawing simple 2D objects and complex 2D objects. This training activity used presentation, teaching, practice, discussion, question and answer, and exercise methods. The theme of this service program activity is "increasing the competency and readiness of vocational schools in Banten province to face the global economy and the world of work through training and strengthening drawing soft skills." The nature of this activity was carried out offline by inviting teacher representatives and laboratory assistants from SMK YP Fatahillah 1 Cilegon. This program aims to increase the competency of teachers and educational staff in mastering the soft skills of drawing to prepare students to face the world of work and industry.

This community service activity occurred from 8 to 10 June 2023 from 08:00 WIB to 08:00 WIB. 16.00 WIB. This service program is located at the Computer Laboratory of SMK YP Fatahillah 1 Cilegon. The committee for community service activities in the form of workshops and training includes lecturers from the Faculty of Mechanical Engineering, FT Untirta, laboratory assistants, and students. The students were from the Technical Drawing Laboratory Assistant and the Mechanical Engineering Student Association (HMM) Department of Mechanical Engineering, FT Untirta. Meanwhile, the participants were representatives of teachers and laboratory assistants at SMK YP Fatahillah 1 Cilegon.

3. Results and Discussion

The workshop activities in this community service activity program were carried out on June 8, 2023, at SMK YP Fatahillah 1 Cilegon. This activity also opens up training activities on the next agenda. Lecturers, reports, and Untirta Mechanical Engineering Department students attended this workshop activity. Teachers and laboratory assistants from SMK YP Fatahillah 1 Cilegon participated in this activity. This activity was attended by speakers from representatives of Untirta Mechanical Engineering lecturers and invited resource persons who understand the AutoCAD program with introductory material to AutoCAD and a glimpse of the use of AutoCAD in the industrial sector. The documentation for workshop activities is presented in Figures 1 and 2.



Figure 1. Workshop participants and committee.



Figure 2. Delivery of workshop activity material.



Figure 3. Training module.

After the workshop, training activities were continued, which will be held on 8-10 June 2023. This training activity uses a module, as presented in Figure 3. In this module, several materials are presented, namely Introduction to AutoCad: Screen Introduction, Getting Started, Coordinate Systems, Converting Images in PDF Format; Drawing Simple 2-Dimensional Objects: Circle, Copy, Line, Trim, and Fillet Commands, Rectangular and Array-Rectangular, Ellipse and Array-Polar, Pline and Offset, Polygon, Circle with Options 3P, 2P, and TTR, Mirror, Rotate and Scale, Arc (Drawing Arcs) and Drawing Complex 2-Dimensional Objects. The material was delivered by resource persons from FT Untirta Mechanical Engineering lecturers and assisted by FT Untirta Machine Drawing Laboratory assistants. Participants in this training activity were 24 participants or delegates consisting of teaching staff and laboratory assistants from SMK YP Fatahillah 1 Cilegon. Documentation of the implementation of training activities is presented in Figure 4.



Figure 4. Training activities.

The training results showed increased participants' abilities in introducing the AutoCAD application. The results can be seen from the power of participants who have never been familiar with the AutoCAD application to carry out the practices and exercises given by the presenters. The achievements of the activities in the service workshop and training program are realized in the participants' work after the training. The results of the participants' work are expected to be able to master all the modules given by the presenters well. Some of the results of the participants' work are presented in Figure 5.

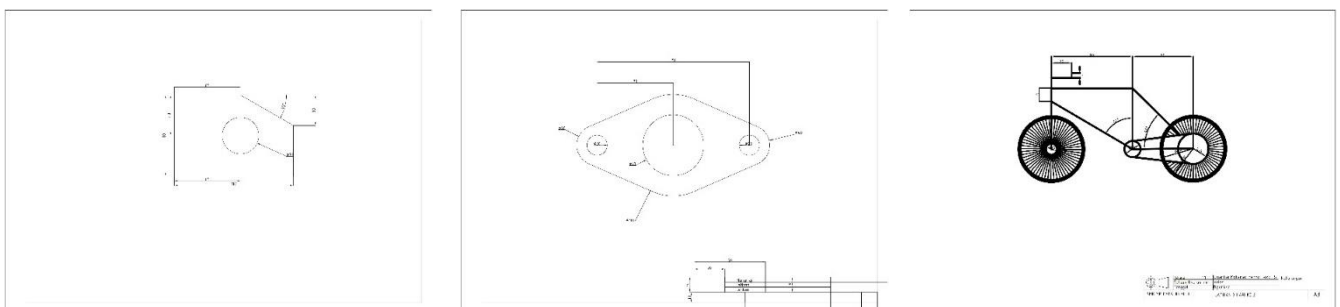


Figure 5. Results of training participants' work.

Improvement in training results can also be seen through the questionnaires given by the activity implementing team, which were given before and after training on a scale of 1-5, namely not at all, not enough, quite, reasonable, and very good. The questionnaire results are presented in Figure 6, while the questions given to participants are shown in Table 1. After the training, there was an increase in the participants' soft skills in 2D drawing using the AutoCAD application. This workshop and training service program closed on the 3rd day by providing souvenirs and certificates for the participants' morning activities. The closing documentation is presented in Figure 7.

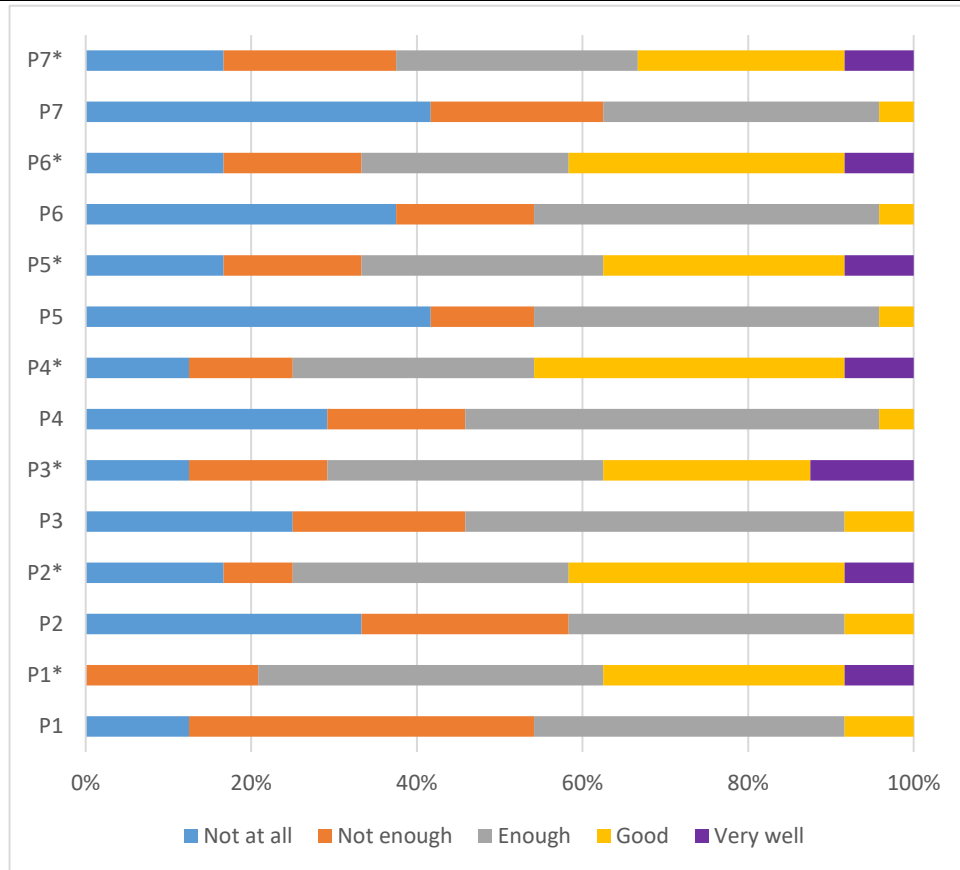


Figure 6. Questionnaire results before and after training.

Table 1. Questionnaire questions before and after training.

No	Pertanyaan	Symbol	
		Before training	After training
1	Know about the AutoCAD application?	P1	P1*
2	Drawing Simple 2 Dimensional Objects using the AutoCAD application?	P2	P2*
3	Understand how to start the AutoCAD application?	P3	P3*
4	Understand the Circle, Copy, Line, Trim and Fillet commands in AutoCAD?	P4	P4*
5	Understand the Pline and Offset Commands in AutoCAD?	P5	P5*
6	Understand the Mirror Command in AutoCAD?	P6	P6*
7	Understand how to draw Polysolid Objects in AutoCAD?	P7	P7*



Figure 7. Closing of workshop and training activities.

4. Conclusion

A community service program has been implemented in the form of workshops and training with partners, namely SMK YP Fatahillah 1 Cilegon, on 8-10 June 2023 with the theme of increasing the competency and readiness of vocational schools in Banten province to face the global economy and the world of work through training and strengthening drawing soft skills. The training material is about an introduction to AutoCAD, drawing simple 2D objects and complex 2D objects. There were 24 participants in this training activity consisting of teachers and laboratory assistants at SMK YP Fatahillah 1 Cilegon. This training activity uses presentation methods, tutorials, practice, discussion questions and answers, and exercises. The training results showed increased participants' abilities in 2D drawing using the AutoCAD application.

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