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Improving Drawing Competence Using Revit Software for Teachers of Vocational High School 6 Surabaya, Indonesia

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Abstract
The purpose of this study was to analyze learning using modules that have been implemented in Vocational High School 6 Surabaya teachers so far to provide additional competencies to teachers of Islamic Boarding Schools. This experimental study was conducted naturally to analyze learning using modules that have been implemented. Sample and data collection. The sample used was 25 teachers selected based on their Visual Communication Design expertise. The data on learning outcomes and teacher responses that had been obtained were then analyzed using the Microsoft Excel application. Teacher learning outcomes showed that the findings obtained with sufficient results were 6 indicators and good results were 4 indicators. The results of teacher responses to lecturers showed that the findings obtained with very good responses were 6 indicators and good results were 2 indicators. The conclusions obtained showed that the implementation of learning using drawing modules using the Revit application was able to improve teacher learning outcomes and the responses given by teachers were very good.

Keywords: Learning Module, Revit Application, Competency Improvement, Drawing

1. Introduction

Vocational High School 6 Surabaya has a building drawing subject with educational subjects and drawing practice using Autocad. It is important to improve the competence of manual drawing teacher to have drawing competence using the Revitapplication. Drawing using a computer is divided into 2D (two-dimensional) drawing and advanced 3D (three-dimensional) drawing. 3D drawing is a product of the appearance of a design drawing, this drawing will show the beauty and at the same time show the shape of a building realistically because it can be rendered like a natural drawing. Likewise, the Revitapplication is a drawing application based on Building Information Modeling (BIM). The benefit of the BIM application is reducing construction time because it can obtain the room area and building volume. The problem with drawing using the Revitapplication is that the original software is expensive, so it is difficult for Vocational High Schools to buy the software, especially since teacherand teachers are not yet familiar with using the Revitapplication.

2. Problem

As a solution, in an effort to increase the drawing competence of teacherat Vocational High Schools, Revitsoftware from the PKM Team is used. In order to increase competence which is an implementation of self-development for teachers. So at Vocational high School 6 Surabaya and Surabaya State University are working together to hold training on the use of the advanced Revit application, the results of which will be used for learning at Vocational high School 6 Surabaya and at the same time as increasing teacher competency. Training methods include discussions, questions and answers and project work both in groups and independently and learning uses direct and group models and continuity will use communication via email.
The problem with drawing using the Revit application is that the original software is expensive and the Revit application is still only used in the Vocational High School environment, so there are still many teacher at Vocational High Schools who still use the AutoCad application in their lessons.

Therefore, it is one of the considerations why Vocational high School 6 Surabaya is a training place for drawing teachers. Due to the demands of the times and technological developments which require drawing teacher to increase their competence, especially in the use of applications that develop according to needs. This problem also arose when the Directorate of Vocational High Schools created a School Competency Competition (LKS) Program at the Middle level both at national and regional levels using the Revit application, which previously still used the Revit application. This first happened this year, there were very few registrants for the Teacher Competency Competition at both regional and national levels. This is a consideration for the Unesa Community Service Team providing training to Vocational High School (SMK) teacher on drawing using the Revit application.

3. Methods and Discussion

In order to improve professional competence which is the implementation of self-development for teachers, Surabaya State University in collaboration with Vocational high School 6 Surabaya regency held training on the use of *software Revit* the results of which will be used for learning at Vocational Schools in an effort to increase the competence of teacher at Vocational high School 6 Surabaya Regency as well as for learning for teachers in the Building Modeling and Information Design (DPIB) skills competency. Based on these problems, we, the PKM Team, will provide increased drawing competency using the Revit computer application to teacher at Vocational high School 6 Surabaya Regency.

The method used for this activity is training which will be carried out at Vocational high School 6 Surabaya regency including;

- The learning model is direct learning (*Direct Instruction*) and group (*cooperative*).
- Each *chapter* (Chapter) is designed for question and answer discussions and group/independent assignments.
- Evaluation will be carried out on every training day. Continuing discussions and questions and answers will be held via email (distance learning).
- The results of this PKM activity are the work of the training participants which can be seen as below:
- The training participants which were previously targeted at only 25 teacher turned out to be 23 participants in practice
- Drawing learning modules are arranged using the Revitapplication, each participant (teacher) gets a Revitmodule book.
- Increasing professional competence for teacherand providing competency certificates.
- Participants (teachers) can draw and teach using the Revit application
- Increased cooperation between Vocational high School 6 Surabaya Regency and Surabaya State University will be enhanced in other activities.

Fig 1: Training Opening

Fig 2: Photo with the training participants

Fig 3: Training activities

Fig 4: Training activities in the laboratorium

4. Conclusion

The training conducted by Surabaya State University in collaboration with Vocational High School 6 Surabaya Regency successfully enhanced the professional competence of teachers, particularly in the Building Modeling and Information Design (DPIB) skills competency. Utilizing the Revit software, teachers gained practical drawing skills, effectively integrating these into their teaching practices. The training, based on direct instruction and cooperative learning models, involved interactive sessions, assignments, and ongoing evaluations, ensuring comprehensive skill development.

Though initially planned for 25 participants, 23 teachers actively participated and demonstrated significant improvement. Each participant received a Revit module book, and competency certificates were awarded, validating their skills. The initiative strengthened the partnership between the institutions and laid the foundation for future collaborations. This program not only enhanced teaching effectiveness at Vocational High School 6 Surabaya but also exemplified the potential of targeted training in fostering professional growth among educators.

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