



The Feasibility Study of the Facilities and Infrastructure of Computer Drawing Laboratory at the Modelling Design and Building Information Department of SMK Negeri 2 Salatiga

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Abstract. The educational facilities and infrastructure in schools must meet with minimum standards in accordance with regulations from the government. The aims of this study is to determine the feasibility level of the existing facilities and infrastructure in the Computer Drawing Laboratory at the Modelling Design and Building Information Department of SMK Negeri 2 Salatiga. The method that used in this study is quantitative research with observation and documentation methods. The research instrument that used in this study was a questionnaire sourced from PERMENDIKNAS Number 40 of 2008 and the Verification Instrument of BNSP Number 1023-P2-18/19 of 2011. The results of this study indicate that the achievement level of feasibility for all aspects of facilities and infrastructure assessed is 80% to 100% or all of them are in the “very feasible” category, with the lowest achievement value of feasibility is in the aspect of space area of the Computer Drawing Laboratory which is at 80%, aspects of room furniture of the Computer Drawing Laboratory get an achievement value of feasibility at 95%, and 3 other aspects consisting of educational media, equipment, and the quality of the main equipment of the Computer Drawing Laboratory get an achievement value of feasibility at 100%.

Keywords: Feasibility · Facilities and Infrastructure · Computer Laboratory

1 Introduction

The education is a continuous process that must continue along with human age. Education is also the spearhead for a nation. If the education of a nation goes well, the next generation will also do well. The quality education will certainly produce human resources who can optimize other potential resources in a country. This means that education is expected to be able to move every individual to improve the quality of their existence and be able to inspire.

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One of the most important components in the educational process is the availability of educational facilities and infrastructure. Based on this, it is necessary to have a good management and maintenance of educational facilities and infrastructure by the school so that educational facilities and infrastructure can still be used optimally to support educational activities [1][2]. In its implementation, it needs a school principal who understands the management of educational facilities and infrastructure based on national education standards that have been set by the government through the Government Regulation of the Republic of Indonesia No. 19 of 2005 [3]. In the Government Regulation of the Republic of Indonesia Number 19 of 2005 about National Education Standards, there are 8 standards, they are (1) Content Standards; (2) Process Standards; (3) Graduate Competency Standards; (4) Educators and Education Personnel Standards; (5) Facilities and Infrastructure Standards; (6) Management Standards; (7) Financing Standards; and (8) Educational Assessment Standards [4].

A good quality of the educational facilities and infrastructure can support the success of learning activities in the classroom, teachers can take advantage of the facilities and infrastructure that are already available to support and enrich the material presented to students, and students can also be more motivated in participating in classroom learning activities [5]. In particular, within the scope of vocational high schools (SMK), the existence of good quality of the educational facilities and infrastructure is a necessity to support learning activities in vocational high schools (SMK), which mostly contain practical learning activities [6][7]. To find out the quality of the educational facilities and infrastructure in vocational high schools (SMK), a feasibility study is needed to assess the condition of the existing facilities and infrastructure consisting of laboratory room conditions, laboratory equipment conditions, and laboratory support equipment conditions. From the results of the feasibility study, it can also be used as a guide to provide advice to schools regarding improving the quality of the existing educational facilities and infrastructure [8][9].

In carrying out a feasibility study of the educational facilities and infrastructure, it must be based on regulations that have been set by the government. The regulations that can be used as the basis for conducting a feasibility study of educational facilities and infrastructure in vocational high schools (SMK) are the Regulation of the Minister of National Education of the Republic of Indonesia (PERMENDIKNAS) Number 40 of 2008 about Standards of Facilities and Infrastructure for Vocational High Schools and Verification Instruments from BNSP Number 1023-P1-10/11 of 2010 about Verification Instruments for Vocational High Schools that Organize Vocational Practice Exams for Building Drawing Engineering Skills Competencies. In the Regulation of the Minister of National Education of the Republic of Indonesia Number 40 of 2008 contains the minimum standards for the Building Drawing Computer Laboratory Room, they are (1) Area of Building Drawing Computer Laboratory; (2) Ratio to Students; (3) Space Capacity; (4) Area of Storage Room and Instructor; (5) Furniture in the Building Drawing Computer Laboratory Room; (6) Educational Media in the Building Drawing Computer Laboratory; and (7) Computer Laboratory Room Equipment [10]. Meanwhile, the Verification Instrument from BNSP Number 1023-P1-10/11 of 2010 contains the standard specifications of the main equipment that must be available in the Building Drawing Computer

Laboratory Room [11], which is not contained in the Regulation of the Minister of National Education of the Republic of Indonesia Number 40 of 2008.

Based on this, we would like to conduct a study on the feasibility study of the facilities and infrastructure of Computer Drawing Laboratory at the Modelling Design and Building Information Department of SMK Negeri 2 Salatiga. The results of this study are expected to provide information about the feasibility of the facilities and infrastructure in the Computer Drawing Laboratory at the Modelling Design and Building Information Department of SMK Negeri 2 Salatiga which includes computer laboratory space, computer laboratory room, furniture in the computer laboratory room, equipment in the computer laboratory room, educational media and computer equipment specifications. In addition, it is hoped that the results of this study can be used by the school as a benchmark for school development in improving the school laboratory facilities and infrastructure in a better direction.

2 Method

The research on the Feasibility Study of Facilities and Infrastructure of Computer Drawing Laboratory at the Modelling Design and Building Information Department of SMK Negeri 2 Salatiga is a quantitative study by using observation and documentation methods. In quantitative study, the data analysis technique that used is descriptive statistical analysis. Descriptive statistical analysis is a method that used to analyze data by describing the data that has been collected without intending to make a general conclusion [12]. The observation method is a research method that carried out by observing and recording various processes directly or indirectly that appear in a symptom on the object of research [12][13]. While the documentation method is used to provide data in the form of photos during the research process.

The implementation of the observation method in this study was by saw directly the condition of the facilities and infrastructure in the Computer Drawing Laboratory at the Modelling Design and Building Information Department of SMK Negeri 2 Salatiga. Then the observation results that have been obtained were compared with the research instrument in the form of a questionnaire made by the researcher based on the attachment to the Regulation of the Minister of National Education of the Republic of Indonesia Number 40 of 2008 and added with a questionnaire about the standard specification of computer equipment based from the Verification Instrument from BNSP Number 1023-P1-10/11 of 2010.

The scoring system that used in this questionnaire is a rating scale in the form of a checklist with four scoring criteria, they are (1) Score 4 (very feasible); (2) Score 3 (feasible); (3) Score 2 (less feasible); and (4) Score 1 (not eligible). The research assessment criteria based on the rating scale model can be seen in the Table 1.

To get the assessment criteria in the form of a percentage scale, it is done by multiplying the results of dividing between the real score and the maximum score by one hundred percent [12] or in general it can be seen in the following equation.

Assessment Criteria = $(X/Y) \times 100\%$, with:

X = real score from the results of the questionnaire.

Y = maximum score.

Table 1. Research assessment criteria

| Score | Definition | Assessment Criteria |
|-------|---------------|---------------------|
| 4 | Very Feasible | 76% - 100% |
| 3 | Feasible | 51% - 75% |
| 2 | Less Feasible | 26% - 50% |
| 1 | Not Feasible | 0% - 25% |

Table 2. The assessment results for the area of Computer Drawing Laboratory of SMK Negeri 2

| Type of Assessment | Observation Results | Scoring scale | Real Score | Maximum Score |
|--------------------------------|---------------------|-------------------------------------------------------|------------|---------------|
| Student capacity | 32 students | 24 - 32 students | 4 | 4 |
| Computer laboratory area | 120 m ² | More than 94,13 m ² | 4 | 4 |
| Computer laboratory width | 10 m | 8 m - 11,77 m | 3 | 4 |
| Storage and repair space area | 70 m ² | 48 m ² - 70,59 m ² . | 3 | 4 |
| Ratio of room area per student | 3,75 m ² | 2,04 m ² - 3,99 m ² per student | 2 | 4 |
| Total score earned | | | 16 | 20 |

Assessment criteria = $(16/20) \times 100\% = 80\%$

3 Results and Discussion

3.1 The Feasibility Level of the Computer Drawing Laboratory Infrastructure

From the results of the analysis as shown in Table 2, it can be seen that the condition of the infrastructure in Computer Drawing Laboratory Room at the Modelling Design and Building Information Department of SMK Negeri 2 Salatiga get an achievement value of feasibility at 80% (“very feasible” category) (Fig. 1).

3.2 The Feasibility Level of the Computer Drawing Laboratory Facilities

3.2.1 The Feasibility Level of the Furniture in Computer Drawing Laboratory

From the results of the analysis as show in Table 3, it can be seen that the condition of the furniture in Computer Drawing Laboratory Room at the Modelling Design and Building Information Department of SMK Negeri 2 Salatiga get an achievement value of feasibility at 95% (“very feasible” category) (Fig. 2).

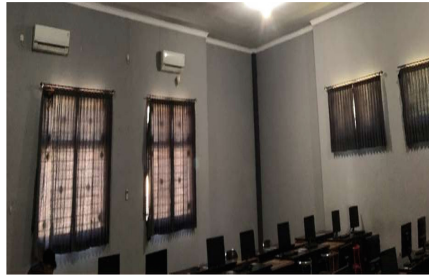


Fig. 1. The condition of the room of Computer Drawing Laboratory of SMK Negeri 2 Salatiga.

Table 3. The assessment results for the furniture in Computer Drawing Laboratory of SMK Negeri 2 Salatiga

| Type of Assessment | Observation Results | Scoring scale | Real Score | Maximum Score |
|------------------------------------------------------------------------------|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------|
| The number of computer desks per student in one computer drawing laboratory | 32 desks | The number of computer desks in one computer drawing laboratory room is between 24 to 32 computer desks that function properly | 4 | 4 |
| The number of computer chairs per student in one computer drawing laboratory | 32 chairs | The number of computer chairs in one computer drawing laboratory room is between 24 to 32 computer chairs that function properly | 4 | 4 |
| Teacher's desk | 1 desk | There is a teacher's desk in a computer drawing laboratory room according to specifications and the desk can function properly | 4 | 4 |
| Teacher's chair | 2 chairs | There is a teacher's chair in a computer drawing laboratory room according to specifications and the chair can function properly | 4 | 4 |
| Tool storage cabinet | 2 cabinets | The number of tool storage cabinets in one computer drawing laboratory room is between 13 to 23 tool storage cabinets that function properly | 3 | 4 |
| Total score earned | | | 19 | 20 |

Assessment criteria = $(19/20) \times 100\% = 95\%$



Fig. 2. The condition of the desk in Computer Drawing Laboratory of SMK Negeri 2 Salatiga

Table 4. The assessment results for the educational media in Computer Drawing Laboratory of SMK Negeri 2 Salatiga

| Type of Assessment | Observation Results | Scoring scale | Real Score | Maximum Score |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------|------------|---------------|
| The computer equipment for a minimum of 16 students to make technical drawings, calculate materials and calculate cost budgets with a computer with a ratio of 1 set/room | 32 sets of computer equipment | 24 to 32 sets of computer equipment that function properly | 4 | 4 |
| The whiteboard with specifications: strong, stable and safe. The whiteboard is placed in a position that allows all students to see the writing on the whiteboard clearly | 1 unit/room | There is a whiteboard in one computer laboratory room according to specifications and can function properly | 4 | 4 |
| Total score earned | | | 8 | 8 |

Assessment criteria = $(8/8) \times 100\% = 100\%$



Fig. 3. The condition of the computer equipment in the Computer Drawing Laboratory of SMK Negeri 2 Salatiga.

Table 5. The assessment results for the equipment in Computer Drawing Laboratory of SMK Negeri 2 Salatiga

| Type of Assessment | Observation Results | Scoring scale | Real Score | Maximum Score |
|---------------------------------------------------------------------------------------------|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------|------------|---------------|
| Contact box | 14 contact boxes | The number of contact boxes in one computer drawing laboratory room is more than 11 contact boxes that function properly | 4 | 4 |
| There is a trash can with specifications: it can accommodate garbage properly and has a lid | 3 trash cans | A total of 3 pieces around the computer drawing laboratory according to specifications and are always cleaned on schedule or when full. | 4 | 4 |
| Total score earned | | | 8 | 8 |

Assessment criteria = $(8/8) \times 100\% = 100\%$

3.2.2 The Feasibility Level of the Educational Media in Computer Drawing Laboratory

From the results of the analysis (as mentioned in Table 4), it can be seen that the condition of the educational media in Computer Drawing Laboratory Room at the Modelling Design and Building Information Department of SMK Negeri 2 Salatiga get an achievement value of feasibility at 100% (“very feasible” category) (Fig. 3).

3.2.3 The Feasibility Level of the Equipment in Computer Drawing Laboratory

From the results of the analysis as shown in Table 5, it can be seen that the condition of the equipment in Computer Drawing Laboratory Room at the Modelling Design and Building Information Department of SMK Negeri 2 Salatiga get an achievement value of feasibility at 100% (“very feasible” category) (Fig. 4).



Fig. 4. The condition of the equipment in Computer Drawing Laboratory of SMK Negeri 2 Salatiga.

Table 6. The assessment results for the main equipment in Computer Drawing Laboratory of SMK Negeri 2 Salatiga

| Type of Assessment | Observation Results | Scoring scale | Real Score | Maximum Score |
|----------------------------------------------------------------------------------------------------------|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------|------------|---------------|
| Computer equipment for students with a minimum processor specification equivalent to Pentium 4, 2.00 GHz | Processor that used is Core i3 | The computer equipment that used has met the minimum standards of the specified specifications | 4 | 4 |
| Minimum memory specification is 512 MB | The memory that used has a capacity of 4GB | The computer equipment that used has met the minimum standards of the specified specifications | 4 | 4 |
| AutoCAD Software that used at least 2006 version | AutoCAD installed on every computer is 2016 version | The software that used in each computer has met the minimum standards of the specified specifications | 4 | 4 |
| Printer | 4 EPSON M100 printers | The printer that used has met the minimum standards of the specified specifications | 4 | 4 |
| Total score earned | | | 16 | 16 |

Assessment criteria = $(16/16) \times 100\% = 100\%$

3.2.4 The Feasibility Level of the Main Equipment in Computer Drawing Laboratory

From the results of the analysis as shown in Table 6, it can be seen that the condition of the main equipment in Computer Drawing Laboratory Room at the Modelling Design and Building Information Department of SMK Negeri 2 Salatiga get an achievement value of feasibility at 100% (“very feasible” category) (Fig. 5).



Fig. 5. The condition of the printer in Computer Drawing Laboratory of SMK Negeri 2 Salatiga

4 Conclusions

The results of this study indicate that the achievement level of feasibility for all aspects of facilities and infrastructure assessed is 80% to 100%, with the lowest achievement value of feasibility is in the aspect of space area of the Computer Drawing Laboratory which is at 80%, aspects of room furniture of the Computer Drawing Laboratory get an achievement value of feasibility at 95%, and 3 other aspects consisting of educational media, equipment, and the quality of the main equipment of the Computer Drawing Laboratory get an achievement value of feasibility at 100%. From all assessments of the feasibility of the facilities and infrastructure that have been carried out at the Computer Drawing Laboratory, it can be concluded that all of the facilities and infrastructure in the Computer Drawing Laboratory are in the “very feasible” category.

Although all of the facilities and infrastructure in Computer Drawing Laboratory are in the “very feasible” category, the researcher hopes that the school will continue to maintain and care for the main furniture, equipment or devices so that they can always function properly. Besides that, it can also maintain a comfortable in the teaching and learning process. In addition, the researcher also hopes that students in the Modelling Design and Building Information Department of SMK Negeri 2 Salatiga can take advantage of the existing facilities and infrastructure as well and as much as possible.

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