IMPROVING STUDENTS' COGNITIVE ABILITY

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IMPROVING STUDENTS' COGNITIVE ABILITY IN CIVIL BUILDING DRAWING COURSES USING JOBSHEET MEDIA

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Abstract: Drawing building construction still poses difficulties for vocational students of the Building Engineering Department. Therefore we need innovative and creative learning media that can be easily understood by students. In other words, the media must be able to increase the construction literacy of student, so that students can easily understand the information and instructions delivered by the learning media. This study aims to illustrate the use of jobsheet learning media in Building Construction Drawing subjects in improving the literacy construction of vocational students of the Building Engineering Department. Through a qualitatively literature review approach, this study concludes that the use of jobsheet media can improve the construction literacy ability of students of Department of Building Engineering. This construction literacy ability will subsequently have an impact on students' ability to complete the tasks delivered in the Building Construction Drawing subject. Jobsheets that can improve competence koqnitive are jobsheets that meet the validity aspects of the jobsheet, namely material, language, appearance, use, consistency, format, graphics, benefits, feasibility. In addition, the jobsheet must also be practical, which is indicated by the fulfillment of aspects including clarity of content, clarity of material coverage, clarity of information, effective and efficient use of language (clear and concise), meaningfulness, appearance, presence of reader appeal, use of fonts writing, lay out jobsheet, clarity of the layout of the structure characteristics of the jobsheet.

Keywords : competence koqnitive, drawing civil building, jobsheet, learning media.

INTRODUKTION

The literacy movement is a movement in the field of reading and writing. Cognitive ability can be interpreted as literacy that intersects with the construction field. Meanwhile, the construction literacy movement is "efforts to increase construction knowledge through both technical and non-technical reading and writing activities" (Andong, 2020). Thus, cognitive abilities can be interpreted as the ability to understand construction knowledge possessed by individuals through reading and writing activities. In everyday life construction literacy is still very rarely discussed. Even a Google search is very rare. In fact, cognitive ability is a factor that can be considered crucial, because the construction field has a scope of language and terms with certain specificities. As conveyed by Gunawan (2005) who presents science about buildings in four aspects, namely the administrative aspect of the building, the architectural aspect of the building, the construction aspect of the building, and the technical aspect of the building. The field of construction which is often presented in the form of drawings has terms and principles that must be understood by academics and practitioners in the construction field. Therefore, understanding of each term in construction must be thoroughly understood, so that the translation of concepts into drawings and translation of drawings into technical forms of buildings can be carried out accurately. Understanding of the terms in this construction needs to be instilled starting from the scope of education. Students who major in building engineering must be able to describe concepts in the form of pictures and explain pictures accurately. The problem that is often found in the field is the difficulty in drawing activities for students at the Building Drawing Engineering Vocational School (Kamiruriansah & Winanti, 2017). This difficulty is mainly due to the use of learning media that still does not support the development of students' drawing skills, which are less innovative and creative (Putri & Rifwan, 2019; Kamiruriansah & Winanti, 2017; Efendi, 2018). Some of the learning media that can be used by teachers in delivering lessons include *job sheets,* photos, graphics, and learning using computers (Andreas & Gusmareta, 2018; Putri & Rifwan, 2019). The learning media observed in this study is thelearning media *jobsheet*, because the use of thelearning media *jobsheet* has been widely used by teachers in the Engineering Department Vocational School. Where several studies have shown that the use of innovative and creative jobsheet media can increase the achievement of vocational students' drawing competence (Nuryanto, Rahayu, & Setiadi, 2020), both for building construction subjects (Efendi, 2018; Kamiruriansah & Winanti, 2017) and building engineering drawings (Putri & Rifwan, 2019).

Jobsheet is a learning media in printed form that contains a series of guides and pictures on how to do the work that must be done by students (Slamet, 2005; Trianto, 2009), so that students can use them to carry out investigations or problem solving activities (Trianto, 2009). . Thus, when the jobsheet is used as a learning medium in construction drawing engineering subjects, the jobsheet will describe the types of drawings, the shape of the images, the steps that must be taken in compiling the drawings. Where in the guide there will be many terms that must be understood by students to support the development of drawing technique skills and students' cognitive abilities at the same time. Furthermore, the focus of this research is on the jobsheet learning media, aspects that must be considered in the preparation of the jobsheet, the impact of using the jobsheet on construction literacy skills and students' building construction drawing skills.

RESEARCH METHOD

This research framework uses the following analytical model adapted from Fink (2010):

a. Determining Research Questions
b. Collecting Literature (Library) from Various Sources
c. Conducting Review in Resources Has Collected

Quality Monitoring:

a. Ensuring Sufficiency, Reliability and Accuracy of References

Synthesize Results:

a. Report existing information; to justify the need for research;
b. explain research findings;
c. explain the quality of research

Results: Descriptive review in the form of synthesis

HASIL

Figure 1. Research Framework (adapted from Fink, 2010).

This study uses a literature review approach, which is a systematic, explicit, and reproducible research approach with the aim of identifying, evaluating, and synthesizing studies that have been conducted and recorded by existing researchers, academics, and practitioners (Fink, 2010). Thus, the data collected is derived from secondary data, namely from the empirical and theoretical literature. Meanwhile, this research design is qualitatively oriented which is intended to convey the context and needs of the research submitted (Pan, 2017). Where the purpose of this research is to convey the importance of jobsheets as learning media in building construction drawing subjects in relation to improving cognitive abilities and building construction drawing skills in vocational students. Data analysis was carried out in a narrative manner which was presented in the form of text and graphics.

DISCUSSION

A. Cognitive Ability

Cognitive ability Literacy is generally understood as the ability to read and write. Baran (Ahmadi & Ibda, 2018) states that literacy is the ability to understand written symbols efficiently and effectively, as well as comprehensively. The Education Development Center (Nur, 2019) states that literacy is more than just the ability to read and write, but literacy is the ability of individuals to use all their potential and expertise in life, with the understanding that literacy is the ability to read words and read the world. Barton (Ahmadi & Ibda, 2018) explains that literacy practice is a social event that includes reading and writing activities, where in building literacy as an event, it can be seen from how individuals live their daily lives. Unesco (Nur, 2019) explains that literacy skills can empower and improve the quality of individuals, families, communities. Literacy is formed in a different way from the life of each individual and every community group (Ahmadi & Ibda, 2018). Literacy abilities can be formed through habituation, because literacy skills do not appear instantly and are not formed just like that, so it requires a process that is conditioned to be experienced and carried out by students to start habits (Padmadewi & Artini, 2018). More specifically, cognitive ability is the ability to read and write construction knowledge (Andong, 2020). Thus, cognitive abilities can be interpreted as the ability to understand construction knowledge possessed by individuals through reading and writing activities. Referring to an empirical study conducted previously which stated that the use of activity sheet learning media or worksheets in learning methods, in fact, can improve students' literacy skills (Izzatunnisa, Andayani, & Hakim, 2019). In addition, other studies also mention that one of the factors that support the learning process that can provide meaning and students' literacy skills is to provide quality teaching materials (Nurhidayah, Irwandi, & Saridewi, 2015) which are delivered through effective, creative, and effective learning media. and innovative (Putri & Rifwan, 2019; Kamiruriansah & Winanti, 2017; Efendi, 2018).

B. Learning Media Learning

Media is a communication tool during teaching and learning activities used by teachers and students (Sumiharsono & Hasanah, 2017), whose function is not only as a teacher's tool, but as a carrier of

information or learning messages that are in accordance with student needs (Development Team Education Science FIP-UPI, 2007). Conceptually, learning media can be defined as a container of messages, where the material to be conveyed is a learning message with the aim of supporting the learning process. In this case, the use of creative learning media will increase the possibility for students to learn more, remember what is learned better, and improve performance in performing skills in accordance with the learning objectives (Riyana, 2012). Kemp & Dayton (Sumiharsono & Hasanah, 2017) state that learning media has at least three main functions, namely motivating interest or action, presenting information, and giving instructions. As a presenter of information, learning media provide information about learning materials to students, so that students are motivated to read and interested in learning the material. As an instruction, learning media involve students both mentally and mentally, as well as in the form of real activities, so that learning can occur. Therefore, the material must be designed systematically and psychologically by taking into account the principles of learning in order to provide effective instruction. This learning media must also be able to provide a pleasant experience and meet the individual needs of students.

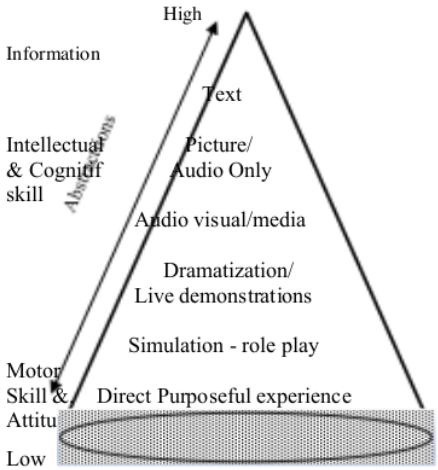

Figure 1. *Dales's Cone Experience* (Riyana, 2012)

Learning media provides experience for students can encourage learning motivation, clarify and simplify the concept abstract, and enhance absorption or retention learning (Riyana, 2012). On progress Edgar Dale (Riyana, 2012) classifies media learning from the most concrete to the most abstract. Figure 2 explains that the media the learning used has a classification the most abstract is the learning media in text form, which has informative properties. Furthermore, what is more concrete than the text and is informative is with the use of audio or picture only. Then continue with the media increasingly concrete, namely audio-visual, demonstration, simulation, and hands-on experience.

C. Use of Jobsheets as Media Drawing Subject Learning Building construction

Jobsheet learning media is a form of student worksheets in which you can contains text only, and can also be a combination between text and images. Thus, if referring to Dale's Cone Experience in Figure 2 in advance, then in the jobsheet , the main function are information and instructions. Jobsheet is a guide for complete practical activities that must be carried out by students according to the topic that have been determined (Prastowo, 2011).
The jobsheet has a function as a guide for training in the development of cognitive aspects as well as all aspects of learning in the form of an experimental or demonstration guide (Kamiruriansah & Winanti, 2017), because it contains theories and steps to complete the work.

That is, the jobsheet already contains work instructions and is supported by devices that support learning activities in order to achieve learning objectives. In the preparation of the jobsheet for students of the Building Engineering Vocational School, several things that need to be considered in the preparation of the jobsheet are linguistic material, appearance, use, consistency, format, graphics, and benefits (Putri & Rifwan, 2019). In an empirical study conducted by Cahyani (2019), it shows that a jobsheet is said to be valid when it meets the aspects of jobsheet eligibility, jobsheet language, jobsheet presentation, and jobsheet graphics. In addition, the jobsheet must also be practical, which is indicated by the fulfillment of aspects, including clarity of content, clarity of material coverage, clarity of information, effective and efficient use of language (clear and concise), meaningfulness, appearance, attractiveness of readers, use of fonts. writing, lay out the jobsheet, the clarity of the layout of the characteristic structure of the worksheet.

D. Use of Jobsheets in Improving Students' cognitive abilities.

As mentioned earlier, the function of using instructional media is to provide information, motivation, and instruction. In the jobsheet, the theories and stages or steps that must be taken by students are presented, along with the materials and tools used in carrying out the learning process. Previous research stated that the use of job sheets in the subject of Building Construction Drawings for SMK students was able to increase the achievement of student learning outcomes (Efendi, 2018; Kamiruriansah & Winanti, 2017). This empirical

evidence shows that the use of a worksheet that meets the aspects of the worksheet will be easy to read and understand by students, so that students can capture the information and instructions conveyed through the worksheet. The ability to capture information and instructions ultimately motivates students to act, namely carrying out existing instructions and making building construction drawings based on information and instructions understood by students through the worksheets.
learning, can improveskills students' literacy(Izzatunnisa, Andayani, & Hakim, 2019). In addition, the provision ofteaching materials qualitywill also improveskills students' literacy(Nurhidayah, Irwandi, & Saridewi, 2015), namely teaching materials delivered through effective, creative, and innovative learning media (Putri & Rifwan, 2019; Kamiruriansah & Winanti , 2017; Efendi, 2018).

In summary, the relationship between the use of *jobsheets* with increasingliteracy skills students'and student learning outcomes of the Building Engineering Vocational High School can be illustrated in Figure 3. Figure 3 explains that in supporting the learning process in the subject of Building Construction Drawings, the learning media used is a *job sheet* . In the *jobsheet* , the theory and work steps for drawing building construction are presented. The theory and guidance regarding work steps are delivered in the form of text (narrative) and pictures. Thus, the information and instructions conveyed can be understood easily by students. In the preparation of the *jobsheet* , the aspects of validity and practicality must also be considered, so that students' construction literacy skills are well honed. Aspects of language and graphics, must reflect each type of information and instructions, because the technical language contextually in the field of construction will be different from the general language. Here the importance of a sheet that meets the aspects of validity and practicality, with the use of language that is in accordance with the context of the material being taught. If students' cognitive abilities are honed well, then the understanding of every detail of the content in the *jobsheet* will be easily understood and put into practice in the act of drawing building construction.

CONCLUSIONS AND SUGGESTIONS

A. Conclusions

Based on the description above, it can be explained that:

1. The use ofmedia *jobsheet* can improve the cognitive abilities of students of Vocational High School in the Department of Building Engineering. Thisliteracy ability constructionwill then have an impact on students' ability to complete the tasks presented in theDrawing subject Building Construction.
2. A *jobsheet* that is able to improve literacy constructionis a *jobsheet* that meets the aspects of the validity of the *jobsheet* , namely material, language, appearance, use, consistency, format, graphics, benefits, feasibility. In addition, the *jobsheet* must also be practical, which is indicated by the fulfillment of aspects, including clarity of content, clarity of material coverage, clarity of information, effective anduse of language efficient(clear and concise), meaningfulness, appearance, attractiveness of readers, use of *fonts*. writing, *lay out the jobsheet* , the clarity of the layout of the characteristic structure of the *jobsheet*.

B. Suggestions

Based on the conclusions that have been put forward, the suggestions for this research are:

1. In using the *jobsheet* , the teacher should pay attention to the elements of the feasibility (validity) of the *jobsheet* and also pay attention to theaspect of the practicality *jobsheet* . Thus, students will easily understand the instructions and information conveyed in the *worksheet* , which in turn will make it easier for students to carry out the instructions in the *worksheet* .
2. For the next researcher, they can conduct experiments related todesign *jobsheet* by paying attention to the aspects of the validity and practicality of the *jobsheet* , then testing its impact on students' literacy skills and student learning outcomes.

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