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Conference Paper

The Development of a Smart Learning Platform to Strengthen Students' Metacognition

Sukma Nur Ardini¹, Suwandi¹, Senowarsito¹, Rufus Olanrewaju Adebisi²¹English Education Study Program, Universitas PGRI Semarang, Indonesia²Department of Communication & Behavior Disorders, Federal College of Education, Nigeria**ORCID ID**Sukma Nur Ardini: <https://orcid.org/0000-0001-9746-9005>**Abstract.**

Metacognition Smart Learning (MSLearning) was designed to facilitate teachers and students during the pandemic to conduct a blended learning process where both synchronous and asynchronous learning can be done. The MSLearning platform focuses on metacognition which plays an important role in all learning activities as it helps students to evaluate errors and issues in their problem-solving skills. The objectives of the study were to describe the development of the MSLearning platform and to investigate students' perceptions of MSLearning. A descriptive qualitative method was employed. A questionnaire about individual perception was distributed to 50 students in 10 junior high schools in Semarang city. The learning process of the MSLearning platform involved 7 phases, from opening to closing the lesson, including synchronous and asynchronous steps. Meanwhile, the findings of the students' perception questionnaire showed that the MSLearning platform contents are interesting (72%), the platform makes it easy to understand the existing materials (45%), the completeness of the types of learning using MSLearning platform such as presentation, quiz, video, etc (87%), it can be done independently (91%), and the MSLearning platform can help to build new insights and techniques linked to learning objectives (44%). It can be concluded that the MSLearning platform was suitable for seventh-grade junior high school students in Semarang city. The findings of the present study will be proceeded by the researchers to revise MSLearning platform in terms of the content and to strengthen students' metacognition.

Keywords: Development, smart learning platform (MSLearning), metacognition

1. Introduction

The distribution of messages and lesson content during the learning orientation phase will benefit considerably from the use of learning media at that time. Learning media can boost knowledge, provide facts in an appealing and trustworthy way, facilitate data interpretation, and condense information in addition to increasing student motivation and interest. Latuheru (1) stated that all instruments (aides) or items used for teaching and learning activities have the purpose of disseminating learning messages (information) to

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recipients from sources (teachers and other sources) (in this case is students). According to Hamalik in Arsyad (2), when used ¹⁰ in the teaching and learning process, teaching media can inspire and stimulate learning activities, create new needs and interests, and even have psychological effects on pupils.

The present study has designed Smart Learning System named Metacognition Smart Learning (MSLearning) was designed to facilitate teachers and students in the situation of post pandemic to conduct blended learning process where synchronous and asynchronous can be done thoroughly. With the help of multimedia computers that are online and supported by a connection to the internet network, teachers can organize teaching activities in schools using the Smart Learning System, an e-learning engine system, so that the process of teaching and learning activities can combine ¹⁵ face-to-face learning (synchronous) and online learning (asynchronous). Smart Learning System are varied in types; 1) LMS (Learning Management System), 2) CMS (Content Management System), and 3) SMS (School Management System).

Smart learning in this study has the basic concept of developing students' metacognition in learning English. A good learner is one who is able to recognize their weaknesses or shortcomings and the strengths that exist in them. By recognizing their weaknesses, shortcomings, and strengths, these learners are able to find the best way to overcome their learning problems. With a high awareness of how to acquire knowledge, learners will be able to regulate their behavior to optimize their learning. With an understanding of their strengths and weaknesses, they will be able to improve their performance. The higher their ability to realize what they know about their strengths and weaknesses as learners and the higher their ability to control and adjust their thinking processes optimally, the higher their performance. Thus, when students' metacognitive abilities increase, their performance also reaches a higher level (3).

The development of knowledge and the level of metacognition of students can be done by forming a pattern of scientific thinking (4). This is because the scientific thinking pattern of students will direct students to think critically and creatively in solving a problem (5). Therefore, knowledge is needed about how students think when solving a problem based on their level of metacognition so that appropriate learning can be determined to guide students to solve the problem optimally. Metacognition will help students to evaluate errors and deficiencies in their problem-solving skills. This is because metacognition acts as a controller of cognitive processes so that learning and thinking become more effective and efficient (6). In accordance with the opinion of Rokhima, et. al.(7) metacognition is related to the ability to think of students in terms of their ability to use learning strategies appropriately.

Besides, MSLearning platform focused on metacognition which plays an important role in all learning activities since it will help students to evaluate errors and deficiencies in their problem-solving skills (8,9). The ability to metacognite requires self-awareness of one's own mental state. This self-awareness will help students become more efficient and focus on what they should learn and how to do the learning. Self-awareness will build the ability of students to reflect on themselves, monitor and evaluate the learning strategies that have been carried out, and encourage students to be more productive, independent, and flexible.

Some previous studies were taken as the basic foundation to develop the present study. A positive finding came from Sumadyo, et. al. (10) who analyzed the metacognitive element of the intelligent learning environment to aid in learning. According to the principles of smart learning, metacognitive learning strategies unquestionably demand the support of flexible, responsive, and personalized learning environments. The role of the metacognitive component in the smart learning environment was then put forth. This is a great starting point for study on the design of the smart learning environment. The next study was from Purnamawati, et. al. (11) the study described a learning device used for industrial electronics metacognition at vocational high schools in Makasar, Indonesia. Another institution that focused on investigating theoretically device designs based on learning metacognition. It was found that the learning device and instrument studies have valid criteria to be implemented with the same families at vocational high schools. There were no studies which focused on designing smart learning platform to strengthen students' metacognition.

With those backdrops in mind, the objectives of the present study were 1) to describe the development of MSLearning platform, and 2) to investigate students' perception about MSLearning. The goal that the study was to convey the incorporation of important aspects or factors in learning that are combined into a new and interesting research topic, which is certainly useful in the world of education in the future. For this reason, the researchers chose the topic of "The Development of Smart Learning Platform to Strengthen Students' Metacognition". It is to convey benefits and explanations related to new innovations in the English learning process that follow the development of current student needs, which is the form of interesting visual learning.

2. Method

The present study employed descriptive qualitative design to analyze the data and displayed them with percentage to show clearly the perception. Research that aims to

explore the events, conditions, or other items that have been mentioned is described as descriptive research, and the findings are provided in the form of a research report(12). In descriptive research, there are phenomena in the form of forms, activities, characteristics, changes, relationships, similarities, and differences between one phenomenon and another. MS Learning platform became the first object of the study, then a questionnaire about perception was distributed to 50 students in 10 junior high schools in Semarang city. Further, Creswell(13) stated that Qualitative is an approach to exploring human phenomena. The technique of data collection of this study used a questionnaire, namely a list of written questions that have been made previously to be answered by the respondent, and usually in a clearly defined alternative according to Sekaran (14). This questionnaire uses a Linkert scale from a scale of 1–4, with a scale of 1 from strongly disagree to strongly agree to answer questions about students' perceptions of the smart learning platform trial to develop metacognitive-based teaching materials.

3. Result and Discussion

3.1. Describing the Development of MS Learning Platform

The following is the development of Smart Learning System named Metacognition Smart Learning (MS Learning) which was designed by the researchers to facilitate teachers and students in the situation of post pandemic to conduct blended learning process where synchronous and asynchronous can be done thoroughly.

A. Login to the Smart Learning System

To login LMS MS Learning, you can access the URL: mslearning.id via a browser.

B. Access Smart Learning Courses

After successfully logging in, the system will direct you to the Dashboard menu which contains the course to be followed. Please choose one of the Ms learning courses.

C. Course : Topic Week 1

In the topic of week 1, there are several stages that must be passed to be able to complete learning in metacognition smart learning. Here are the steps:

1. Phase 1

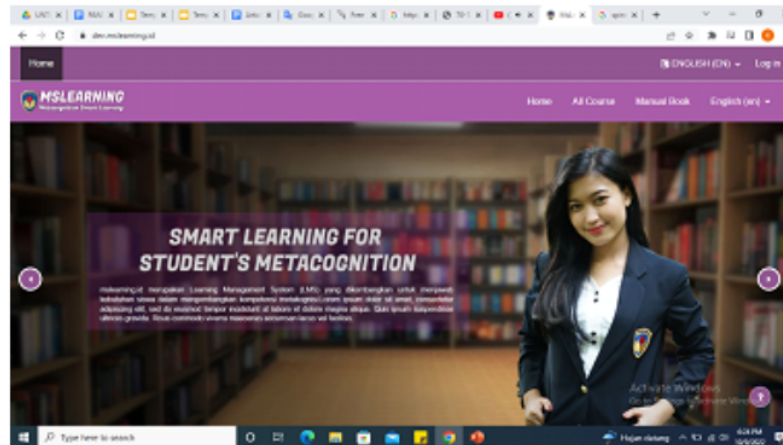


Figure 1: Log In to the Smart Learning System.

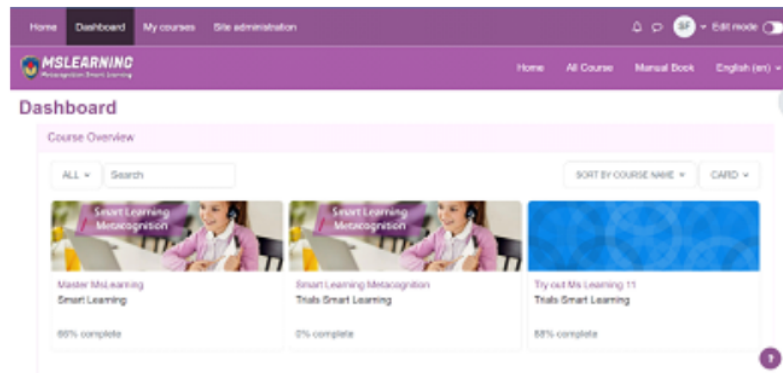


Figure 2: Access Smart Learning Courses.

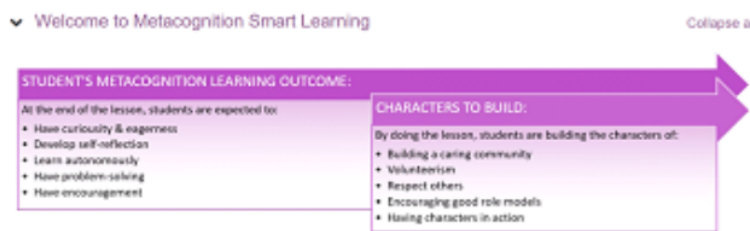


Figure 3: Topic Week 1.

This phase is scaffolding, by going through this phase students will find out what topics they will learn in this lesson independently. Students are asked to watch the video and write down the answers to the study questions as follows:

2. Phase 2



Figure 4: Phase 1.

In this phase, students are required to ask at least 1 question to the teacher regarding video phase 1. This phase is a phase to increase critical thinking and the courage to express opinions. By passing this phase students are expected to be accustomed to critical thinking and dare to express opinions.

To make an inquiry, please follow the steps below.

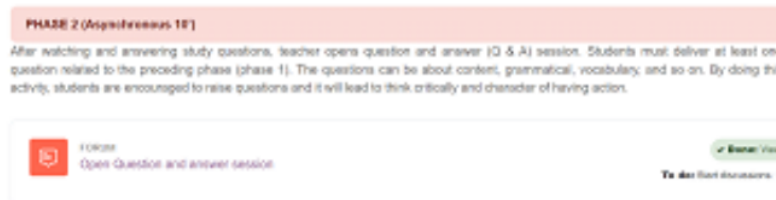


Figure 5: Phase 2.

3. Phase 3

This phase is a phase for teachers to find out the gap between what students understand and what students do not understand. Therefore, this is the opportunity for the teacher to explain the material according to the needs of students. Needs can be identified from the questions sent by students.



Figure 6: Phase 3.

4. Phase 4

This phase is a phase where students have the opportunity to better understand the topic of today's lesson through authentic texts. Here the students work in pairs

(2 people) according to the instructions. The division of groups can be seen in the participant menu.

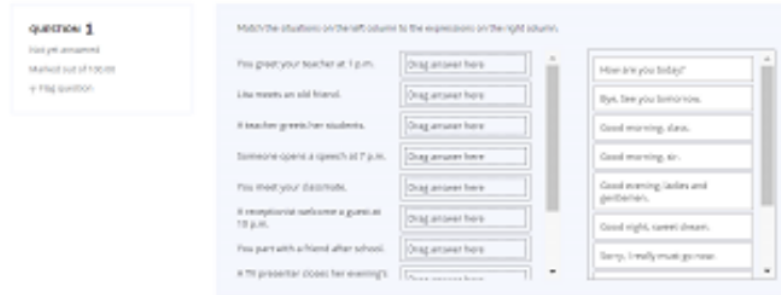


Figure 7: Phase 4.

5. Phase 5

This phase is a phase to discuss the results of student discussions.

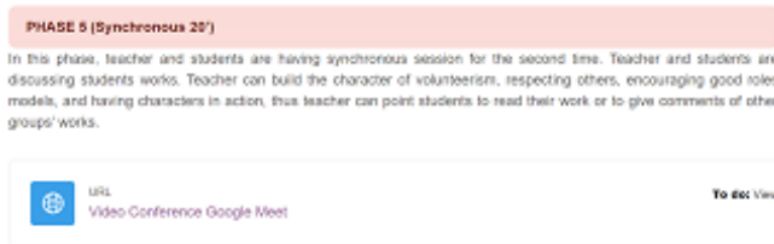


Figure 8: Phase 5.

6. Phase 6

This phase is used by students in collecting assignments.

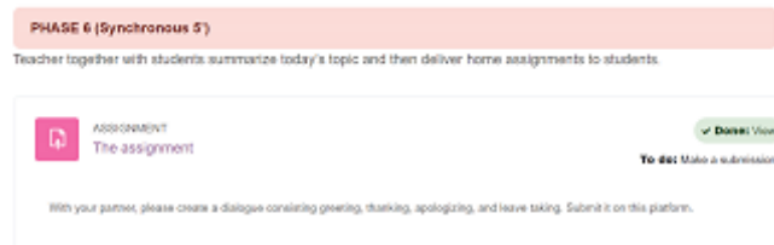


Figure 9: Phase 6.

7. Phase 7

Students are asked to fill out a questionnaire form related to students' perceptions of the topic and platform used.



Figure 10: Phase 7.

By describing the development of the smart learning platform designed by the researchers, it is also achieved the objectives of the study which was aimed to demonstrate how significant learning-related characteristics or factors may be merged into a fresh, engaging study topic that would undoubtedly be helpful in the field of education in the future. In order to strengthen students' metacognition, the researchers developed a smart learning platform as their research topic. The purpose of this engaging visual learning method is to communicate the advantages of new innovations in the English learning process that evolve in response to current student needs.

This research is a new one on the development of visual-based learning media using a platform as a tool to provide learning materials which focus on students' metacognition such as to have curiosity & eagerness, develop self-reflection, learn autonomously, have problem-solving, and have encouragement. Each of the week, MSLearning also has target in characters to build. So, by doing the lesson, the students are building the characters of: building a caring community, volunteerism, respect others, encouraging good roles models, and having characters in action. In addition, the learning process involved 7 phases from opening to closing the lesson including synchronous and asynchronous steps.

According to Flavell, "metacognition" is thinking about one's own thinking (thinking about thinking) or one's knowledge of one's own thinking process. According to O'Neil & Brown, metacognition is a process in which a person thinks about thinking in order to build strategies to solve problems. Thus, metacognition is an important stage that students need to master to hone critical thinking in dealing with a problem. Therefore, the MSLearning can facilitate teachers to build students' metacognition.

3.2. The Students' Perception

Based on the finding obtained through questionnaires distributed to 50 students of the seventh grade from 10 junior high schools in Semarang city, the researchers obtained data on their perceptions of using MSLearning platform in the English lesson. The

finding of this research have important aspects that can support the development of MSLearning platforms and strengthen students' metacognition by looking at the results of students' perceptions in using the learning platform. The finding includes the following aspects:

1. MSLearning platform contents are interesting,
2. MSLearning platform makes it easy to understand the existing materials,
3. Completeness of the types of learning using MSLearning platform such as presentation, quiz, video, etc,
4. MSLearning platform can be done independently,
5. MSLearning platform can help to build new insights and techniques linked to learning objectives.

The results of the calculation of the questionnaire distributed to students are depicted in the following diagram:

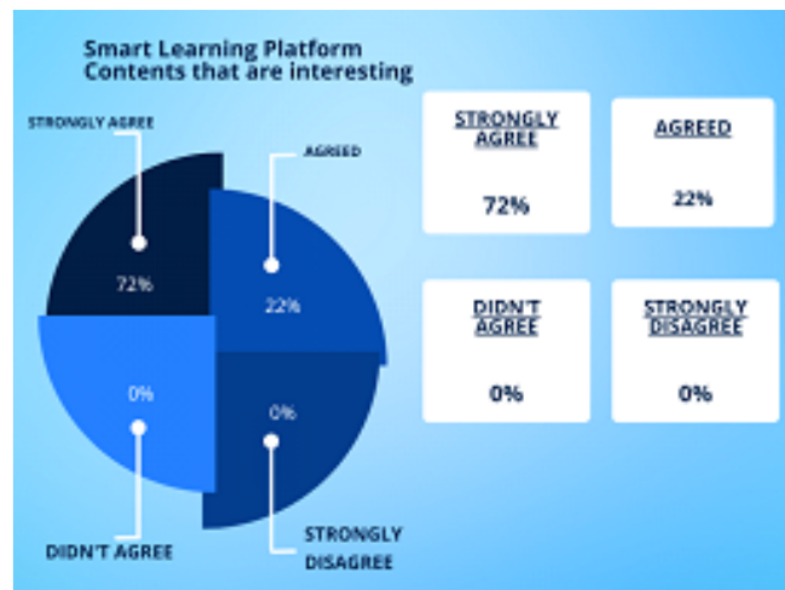


Figure 11: The Result of "MSLearning platform contents are interesting".

In the perception on the aspect of "MSLearning platform contents are interesting", respondents chose 72% strongly agree, 22% agree, 0% to disagree and strongly disagree in the perception that the smart learning platform has an attractive appearance when used in learning.

The perception result for the aspect "MSLearning platform makes it easy to understand the existing materials" Respondents chose 45% strongly agree, 55% agree, 0%

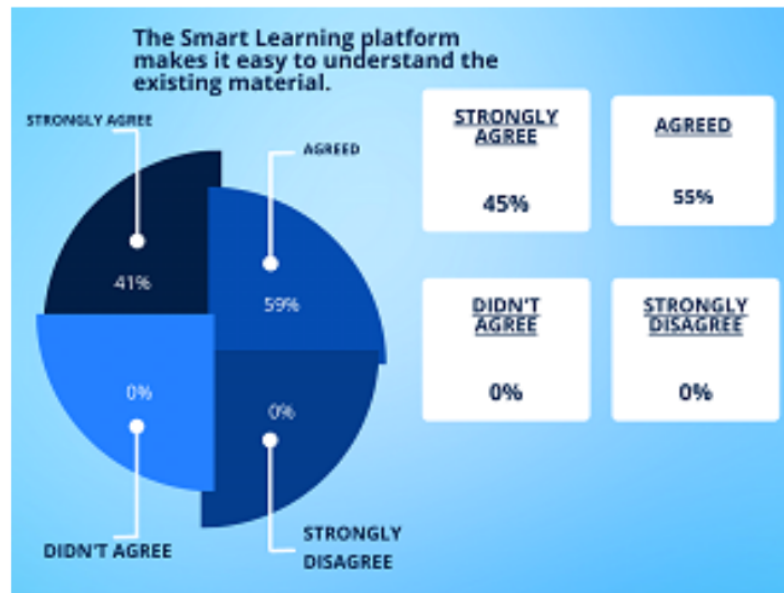


Figure 12: The Result of "MSLearning platform makes it easy to understand the existing materials".

disagree and strongly disagree, so it can be concluded that the smart learning platform makes it easier to understand the material presented.

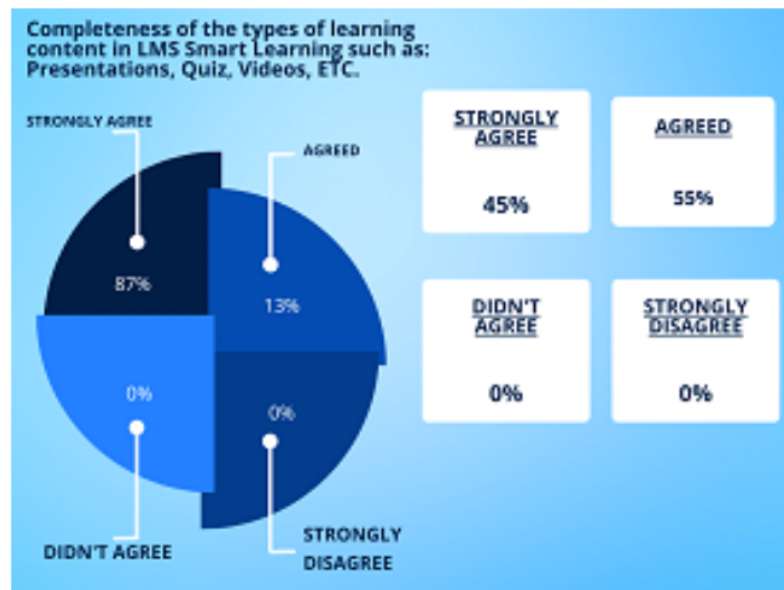


Figure 13: The Result of "Completeness of the types of learning using MSLearning platform such as presentation, quiz, video, etc."

The results of the perception in the aspect of "Completeness of the types of learning using MSLearning platform such as presentation, quiz, video, etc." Respondents gave a choice of ¹⁴ 87% strongly agree, 13% agree, 0% disagree, and 0% strongly disagree, so that it can be concluded that the smart learning platform has various types of teaching materials presented in the form of presentations, quizzes, and videos that can create interest in learning the material that is presented.

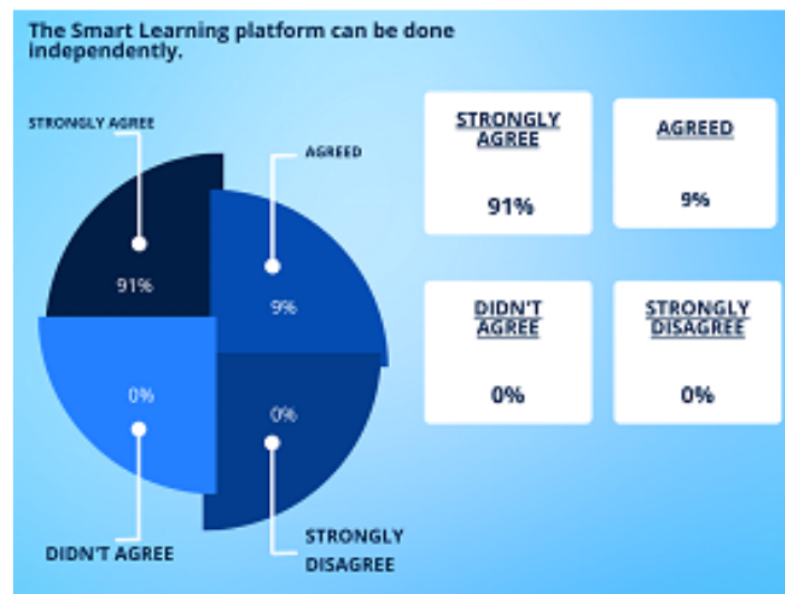


Figure 14: The Result of "MSLearning platform can be done independently." .

According to respondents' perceptions, "MSLearning platform can be done independently". Perceptions of respondents chose ¹³ 91% strongly agree, 9% agree, 0% disagree, and 0% strongly disagree. It can be concluded that most strongly agree that learning using a smart learning platform can be done independently by students to understand the material that has been presented.

According to respondents' perceptions on the aspect of "MSLearning platform can help to build new insights and techniques linked to learning objectives". Respondents chose ¹¹ 44% strongly agree, 54% agree, 2% disagree, and 0% strongly disagree. So it was concluded that some respondents agreed that the smart learning platform could help build new insights and techniques related to learning objectives, but there were also 2% of respondents who disagreed with this aspect.

This research is a new one on the development of visual-based learning media using a platform as a tool to provide learning materials. The results of this study can be

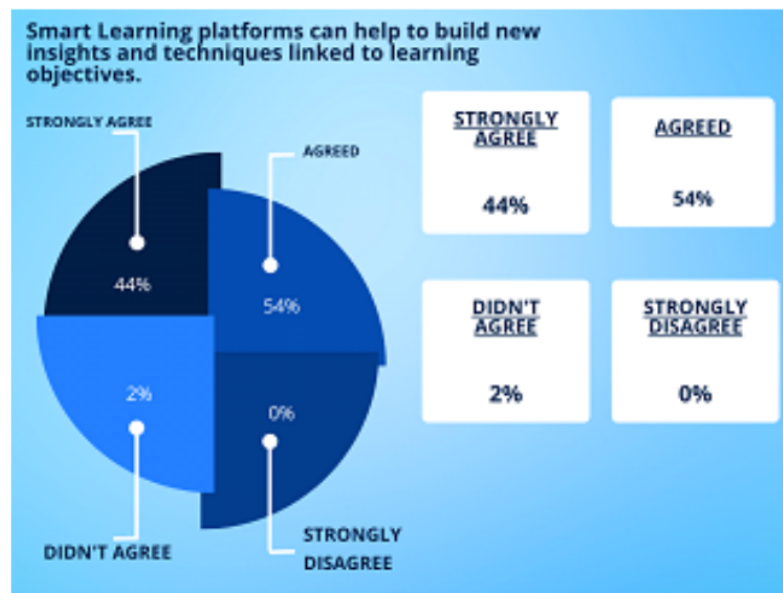


Figure 15: The Result of "MS Learning platform can help to build new insights and techniques linked to learning objectives."

taken into consideration to improve and complete the various aspects needed for the development of visual-based learning media in order to increase student' metacognition competence. The finding of the students' perception showed that 1) MS Learning platform contents are interesting (72%), 2) MS Learning platform makes it easy to understand the existing materials (45%), 3) Completeness of the types of learning using MS Learning platform such as presentation, quiz, video, etc (87%), 4) MS Learning platform can be done independently (91%), 5) MS Learning platform can help to build new insights and techniques linked to learning objectives (44%).

4. Conclusion

Smart Learning System named MS Learning can be used synchronous and asynchronous learning to support the development of visual-based learning media using a platform for smart learning in order to strengthen students' metacognition. The questionnaire results showed that the smart learning platform was interesting platform for seventh grade junior high school students in Semarang. It can be concluded that MS Learning platform was suitable for the seventh-grade junior high school students in Semarang city. The findings of the present study will be proceeded by the researchers to revise MS Learning platform in terms of the content and to strengthen students' metacognition.

Acknowledgements

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