

## DESCRIPTION OF MATHEMATICAL SENSE MAKING PARTICIPANTS ASSISTED BY THE INTERACTIVE LEARNING MEDIA OF LECTORA INSPIRE

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### ABSTRACT

Utilization of the application program as a medium of learning mathematics is the basis of this research. As is well known that the current application program is one tool that is widely used in learning. Therefore researchers will use the Lectora Inspire application program as a learning medium to describe mathematical sense making students. The purpose of this development is (1) Knowing the process of making interactive learning media with Lectora Inspire (2) Knowing the feasibility of an interactive learning media developed. (3) Improving students' sense of making after using MILEA. The purpose of designing MILEA is to help teachers in learning activities and provide a new atmosphere in learning activities so as to improve students' sense of making. The development model used is the ADDIE development model. The results of this study indicate that: (1) An interactive mathematics learning media has been produced referring to the ADDIE development model with the help of Lectora Inspire Software, (2) The development of this learning media has been validated and declared feasible to use, (3) The percentage increase in participants' sense making students after using MILEA by 68%, MILEA meaning is proven to increase students' sense of making.

*Keywords: Interactive Media, LectoraInspire, Sense Making*

### INTRODUCTION

The success of a teacher in the learning process is determined by several factors. The role and creativity of a teacher is one of the critical success factors. At present, there are still teachers who only use conventional approaches so there is no interesting, creative and critical teaching and learning process (Djamas& Padang, 2018). This has an effect on the underdevelopment of students' sense making. One way to find out students' sense of making is to utilize learning media that is adapted to current technology. By utilizing these media the teaching and learning process in the classroom becomes interesting and fun. Innovation of learning models is very necessary and very urgent, because currently technology has developed so rapidly.

The progress of science and technology is very rapid and global in nature forcing education providers to improve the quality of education and learning continuously to produce quality graduates. The current era of globalization is marked by the increasingly widespread use of computer technology in almost all aspects of life, especially in the field of education. Computer-based media can combine a variety of media both for learning purposes or not (Abykanova&Nugumanova, 2016). This diversity of media includes text, images, audio, video, animation and even simulation.

The results of preliminary studies that have been conducted by researchers show that students are less able to develop sense making on some geometry material, one of which is material to build space. Students have difficulty in understanding which parts are diagonal fields, diagonal spaces, diagonal fields, nets and so on because the teacher provides an incorrect learning strategy.

Generally books used in classrooms display images that are less understood by students. Therefore we need interesting learning media by using the help of computer technology visualization so that the application of mathematics learning will become more real, efficient and enjoyable. Therefore, the use of technology is very much needed so that mathematics learning can be done by using technology-based learning media.

Problems that arise when researchers conduct field studies make researchers consider not only using conventional approaches when they want to know students' sense making. However, researchers want to take advantage of technology that is developing now. The reason is that the researchers made it into consideration for making research, specifically it can be said that the purpose of this study was to identify and describe the students' sense of making by using the help of learning media developed using Lectora Inspire software.

## **LITERATURE REVIEW**

### **Lectora Inspire Interactive Learning Media**

Interactive learning media is a teaching delivery system that presents computer-controlled video recordings to students who not only hear and see video and sound, but also provide active responses, and those responses that determine the speed and sequence of presentation (Kosucu, 2017). Interactive understanding in this case is related to two-way communication or more with several components. The component of communication in interactive media (computer based) is the relationship between humans (as users / users of products) and computers (software / applications / products) in certain formats, usually in the form of Compact-Discs (CD). To support the creation of interactive learning media, a teacher can use many tools. In this case, researchers use one of the most widely used software to make presentation materials and teaching materials. The tool used is Lectora Inspire.

Lectora inspire is a computer program that is an electronic learning development tool (e-learning), developed by Trivantis Corporation (Muhammad, 2012). This program is one of the application programs that can be used to make presentations and learning media. One of the advantages of Lectora Inspire is that it is easy to use, making it easier for teachers or students to prepare presentation material or teaching material as learning media.

From the beginning this software was created indeed for e-learning needs. Lectora Inspire can be used for learning needs both online and offline which can be made quickly and easily. Content developed with Lectora software can be published to various Outputs such as HTML5, single executable files (.exe), CD-ROMs, and e-learning standards such as SCORM and AICC (Shalikhah, Primadewi, & Faith, 2017).

Based on these benefits, researchers are interested in developing interactive learning media with the help of Lectora Inspire. In this case, Lectora inspire learning media can be interpreted as learning media that uses devices or programs in a computer that have certain functions. The program was designed by researchers to produce a single executable file (.exe) / application used for learning. The resulting application is an interesting interactive learning media that combines text, sound, video, animation in a unity so that it can increase students' learning interest. This learning media is designed to be able to provide information / material to students, examples of questions and practice questions so that later students will be able to learn there or without the teacher or in other words can be used as a means of independent learning of students.

### **Sense Making**

Sense making can be said as taking ideas, or activities to develop an understanding of a situation, context, or concept by linking it with existing knowledge (Biccard, Studies, Africa, & Biccard, 2018). The knowledge referred to in this case is associated with the knowledge obtained by students in learning mathematics. Because, in practice, sense making is needed on an ongoing basis starting from observation, verification to drawing conclusions to solve mathematical problems.

The explanation shows that sense making is one of the cornerstones of mathematics both of which are important in mathematical discussions, as well as important means so that students can better understand mathematics. Sense making should be sought so that it appears at any time in learning in mathematics classes. For example, the teacher or student raises the questions "What is happening here?" And "Why do you think that ...?". To support the development of sense making, the researcher makes several indicators to measure students' sense making. Indicators of student making sense that will be developed in the instrument are as follows:

- Problem solving search patterns: Finding solutions to mathematical problems.

- Look for hidden structures: Find forms of equivalent expression that express different aspects of the problem.
- Looking for different mathematical solutions: Looking for different solution contexts, and different representations.
- Use a different approach to problem solving.
- Generalizing broader solutions of problems and
- Tracing the relationship with other problems.

## RESEARCH METHODS

Judging from the problems that will be discussed in this study the writer will use descriptive research. The research pattern used is research with a qualitative approach and type of descriptive research. This research was conducted at the Middle School Grade IX. The data collected comes from observations and interviews. Out of 34 students, 6 were chosen as research subjects. Research subjects were chosen based on each level of ability. The validity of the research is done by extending the presence of researchers, in-depth observations, and triangulation. The process of data analysis in this study includes three steps, namely data reduction, data display, and conclusion / verification (Sugiyono, 2012: 247).

## RESULTS AND DISCUSSION

### Development of interactive media with Lectora Inspire

MILEA development uses the ADDIE development model following the stages of ADDIE development. In the end, researchers designed and produced interactive learning media as below:

#### Initial Display [Intro]



The initial appearance of learning media shows the identity of the subject of learning media.

Figure 1. Initial Display [Intro]

## Main Menu Display [Home]



There are 6 menu buttons and the main menu is Introduction, Material, Practice Questions, Evaluation and Author. In addition, there is the Exercise Question menu button that functions as an exercise in learning for students.

Figure 2. Main Menu Display [Home]

## Material Menu Display



The Material Menu has three main submenus, namely the submenu for the Tubular Elements material, the submenu for the Tubular Surface Area menu and the submenu for the Tubular Volume menu.

Figure 3. Display Material Menu

## Display Menu of Practice Questions



In the Exercise Training menu there are 5 multiple choice questions where each question has feedback on the answers of the students.

Figure 4 Display Menu of Exercise Questions

## Evaluation Menu Display



On the evaluation menu there are three buttons including the Close button to function to cancel the evaluation, the Home button to return to the main

menu [Home] and the Next button to continue the evaluation.

Figure 5 Display Evaluation Menu

This interactive media has been declared valid and is suitable for use by media experts and material experts.

### Sense Making Analysis of students

The following are the results of the students' sense making analysis. The results of the analysis in the form of a description obtained by researchers from the results of the exercise questions using interactive learning media with lectors inspire, reinforced by interview data.

Table 1. Description of Student Training Sense

Subjek	Deskripsi <i>Sense Making</i>
DD	From the interview results, it shows that the DD subject is able to explain each step of the solution in great detail, but has not been able to meet all the indicators of sense making that have been made, for indicators looking for hidden structures are still not met. Seen from the ability of students to explain in detail the steps to solve the problem, so students are able to meet the indicators made. Thus it can be concluded that the sense of making DD subject within the criteria of "Good".
DR	From the interview results, it shows that the DR subject is able to explain each step of the solution in great detail. From knowing the form, to working on the problem by getting results, but have not been able to meet all the indicators that have been made, for indicators looking for different mathematical solutions has not been fulfilled. Thus it can be concluded that the sense of making DR subjects in the "Good" criteria
MN	From the interview results, it shows that MN subjects are able to explain each step of the solution in great detail but are less than perfect in fulfilling indicators looking for hidden structures and looking for different mathematical solutions, seen from interviews of students who are less able to compile systematic steps and it's still not right like in the picture. Thus it can be concluded that the MN subject's sense making in the criteria of "Good enough".
NK	From the results of the interviews, it was shown that the NK subjects were able to explain each step of the solution in great detail until getting results. However, it is less than perfect in fulfilling indicators looking for hidden structures and looking for different mathematical solutions, seen from the steps of the process which are still in accordance with the formula from the initial step to drawing conclusions. Thus it can be concluded that the sense of making NK subject in the criteria of "Good enough".



DE	From the results of the interviews, it shows that DE subjects are unable to explain each step of the settlement in detail so that it can be said to be unable to meet the sense making indicators that have been made, it can be seen from the results of interviews and tests of students who have not been able to draw conclusions from the results of the work so still not quite right in answering, as in the picture and the next step is wrong. Thus it can be concluded that the sense of making NK subjects in the criteria of "not good"
ZN	From the interview results, it shows that the subject of ZN is less able to explain each step of its completion in great detail and can be said to be less than perfect in fulfilling all the indicators that have been made, it can be seen from the results of the interviews of students who are less able to draw conclusions from the results of work done, from the steps are still wrong and the results are improvised answers. Thus it can be concluded that the sense of making ZN subjects in the criteria of "not good".

## CONCLUSION

The quality of learning media developed has the following results:

a. MILEA is a valid, feasible and practical medium to use

The results of the assessment of media experts and material experts show that MILEA development gets a percentage of 82% from the first validator and 88% from the second validator (Media Expert), while for Material Expert data the percentage is 91%. In conclusion MILEA is a learning media that is included in the valid category and is suitable for use.

b. Sense making increases after using MILEA

Sense making students after using this learning media has increased. This is based on the percentage of test results and interview making students who experienced an increase of 68%.

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