

Learning Design Based on ELPSA Learning Approach for Elementary School Students

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Abstract

This development research aims to produce Student Worksheet with an ELPSA framework in order to improve students' conceptual understanding skills and to determine the quality of LKS based on aspects of validity, and aspects of practicality. The method used in this research is research and development with a model (Analysis, Design, Development, Implementation, Evaluation). The subject of this research is the development of student worksheets with the ELPSA framework. The instruments used to measure the quality of the developed worksheets are questionnaire sheets for the validity aspect, teacher evaluation sheets for practicality aspects, student response questionnaires, and learning outcomes tests to determine students' conceptual understanding abilities. The quality of the validity of the LKS meets the valid criteria based on the assessment of the validator material experts and media experts, with a percentage of 82.85% included in the very good category. The practical quality of the LKS meets the practical criteria based on the teacher evaluation questionnaire with a percentage of 81.50% which is included in the good category so that the LKS is said to be practical. Student responses to the LKS were obtained from a questionnaire with an average of 44.96 included in the very good category. Meanwhile, to determine student learning outcomes, based on the post-test results of fifth grade students at SD Negeri Sangir, the average score was 91.2 with a mastery percentage of 91.2%, which was included in the highly improved category. Thus, the results of this study indicate that the developed worksheets are said to be suitable for use in the learning process in schools that use KTSP and 2013 curriculum because they meet the quality criteria of student worksheets and can improve students' ability to understand mathematical concepts.

Keywords:

Learning Design

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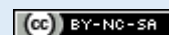
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Introduction

The students are one of the important components in the world of education. In several schools level, one of them is elementary school of age. According to Syamsuddin (Amir & Kusuma W, 2018), cognitive behavior at elementary school age is, "Their ability in the thought process to operate logical rules even though they are still tied to concrete objects". According to (Ananda & Fadhilaturrahmi, 2018), In accordance with the principle of development that children's physical development cannot be separated from their mental, social, and emotional development, because psychological development will affect children to adjust their development abilities. According to Piaget (Amir & Kusuma W, 2018) children aged SD/MI are still at the stage of concrete operational thinking, so children must need aids in developing their learning.

At the stage of thinking with concrete operations, it is necessary to apply an approach with an effective learning design that can develop several kinds of intelligence at once holistically, so that it does not only emphasize the cognitive domain, but also includes the affective, psychomotor and social domains. Basically, most students still have difficulty in understanding the lesson if it is not supported by an effective learning design (Ningrum & Leonard, 2015). According to (Amir & Kusuma W, 2018) The low absorption of students can be easily seen when students are learning in the classroom without a good learning design. Therefore, the quality of teachers is required to always be creative and innovative in compiling learning activities. Starting from the methods and teaching materials used as well as learning outcomes measurement tools. (Hadi, 2016; Firdaus, dkk, 2020) Measurement of teacher quality is not only based on mastery of the material, but teachers are also required to be more creative and innovative in managing learning.

One of the things that influence the achievement of teaching competencies is an approach to effective learning design. According to (Edi et al., 2014) "Learning Design is an activity carried out to determine what learning approach is best implemented in order to cause changes in students' knowledge and skills in the desired direction." This can be interpreted that one of the things that influence effective learning is a learning design that is made according to the needs of students and is carried out for the achievement of learning objectives. One of the learning approaches that can be applied to create an effective learning design is the ELPSA learning approach which contains five components, namely Experiences, Language, Pictures, Symbols, and Applications. According to (Johar, R., Nurhalimah, 2016), that the ELPSA framework makes an individual develop meaningful of learning concepts.

According to (Herwandi & Kaharuddin, 2020), in the ELPSA approach students learn more systematically and are oriented to concept discovery from the knowledge experience they have and are able to involve students' activities directly in constructing their knowledge in the process of understanding concepts and problem solving. According to (Lowrie, T., & Patahuddin, 2015a), one of the learning frameworks based on constructivism is ELPSA (Experiences, Language, Pictures, Symbols, and Applications) which was developed by the RIPPLE team (Research Institute for Professional Practice, Learning & Education) from Charles Sturt University of Australia. ELPSA learning intends to give free space for students to think about concepts and problem solving related to the material taught by teachers in schools. Because basically the learning design aims to make students understand the concept of the lesson and its relationship to everyday life, have the skills to develop knowledge about the natural processes around, be able to apply various concepts to explain natural phenomena and be able to use simple technology to solve problems found in every day of life.

The ELPSA Learning Approach (Experiences, Language, Pictures, Symbols, and Applications) One of the learning approaches based on constructivism is the Experience, Language, Pictorial, Symbol and Application (ELPSA) approach developed by the RIPPLE (Research Institute for Professional Practice, Learning) team & Education) chaired by Prof. Tom Lowrie of Charles Sturt University Australia. (Syahdan, S., & Annas, 2017) Learning Experiences, Language, Pictorial, Symbol, Application (ELPSA) was developed based on constructivism and social learning theory. According to (Herwandi & Kaharuddin, 2020), that this learning is seen as an active process where students build their own ways and understand things through an independent process and social interaction with other students. (Lowrie, T., & Patahuddin, 2015b), the ELPSA framework sees learning as an active process in which students construct their own way of understanding things through individual thinking processes and social interactions with others.

According to Johar, et al. (2016), that the ELPSA framework makes an individual develop meaningful learning concepts. Meanwhile (Arifin, 2015), shows that the application component in ELPSA is a learning activity that seeks to understand the significance of the learning process by applying new knowledge in solving problems in a meaningful context. In the ELPSA approach, students learn more systematically and are oriented to concept discovery from the experience of knowledge they have and are able to involve students' activities directly in constructing their knowledge in the process of understanding concepts and problem solving. According to Lowrie & Patahuddin (2015), one of the learning frameworks based on constructivism is ELPSA (Experiences, Language, Pictures, Symbols, and Applications) which was developed by the RIPPLE (Research Institute for Professional Practice, Learning & Education) team from Charles Sturt Australian University.

The ELPSA learning approach (Experiences, Language, Pictures, Symbols, and Applications) intends to provide free space for students to think about concepts and problem solving related to the material taught by teachers in schools. Because basically learning in schools aims to make students understand concepts and their relevance to everyday life, have the skills to develop knowledge about natural processes around them, are able to apply various concepts to explain natural phenomena and are able to use simple technology to solve problems found in every day life.

As for the components in the learning activities of Lowrie & Patahuddin's ELPSA approach (2015), are as follows. Experiences (E) = Experience Experiences are learning activities that make explicit or bring up previous experiences that students have and connect them with new knowledge and experiences that they will gain. According to (Arifin, 2015), experience includes how students have learned so far, what concepts they know, how they can obtain information, and how the lessons have been experienced by students both inside and outside the classroom. (Syarifuddin, 2016) Knowledge is built when students try to organize their experiences according to their cognitive structure. (Pertwi, 2019) The experience component also involves assessment because teachers need to know what students already know and what new information needs to be introduced to help students understand. Language (L) = Language Language (language development) is a learning activity that actively develops the language of a particular subject so that it is interpreted by learners. Language is used to encourage understanding. In science, language can be general or specific and is needed to present bright ideas. (Indriani1, 2018) It is important for teachers to model the correct language and students need to be encouraged to use clear language in describing their understanding to the teacher and their friends. This is explained by Sutawidjaya (Johar, R., Nurhalimah, 2016), that language is an important element in every learning. It can happen that students do not understand a lesson concept not because the concept is too difficult for them but because the teacher who presents it uses words or sentences that students cannot understand. Pictures (P) = Pictures (image representation) are learning activities that provide the experience of recognizing concepts in the form of pictures. The image of representation (the "P" component of ELPSA) can be used to stimulate students to think mathematically and systematically. (Syarifuddin, 2016) Teachers need to consider what pictures or visualizations are more effective in helping students' understanding a subject that can be a stepping stone for students to arrive at the "S" component of ELPSA.

According to Alcock and Simpson (Herwandi & Kaharuddin, 2020), explaining that visualization is important in mathematical thinking that can be realized in the form of images on paper or displays from technology. Symbols (S) = Symbols Symbols (symbol representation) are learning activities that can change or make the transition from image representation to symbol representation. The concept of a subject contains symbols, either in the form of formulas or abstract statements. (Lowrie, T., & Patahuddin, 2015b), emphasizes that Symbols in ELPSA are more general experiences and are the result of generalizations. Application (A) = Application of knowledge Application is a learning activity that seeks to understand the significance of the learning process by applying new knowledge in solving problems in a meaningful context. (Arifin, 2015) & (Indriani1, 2018) the application stage describes how the knowledge that has been obtained can be applied in various situations. Thus, in the application component students use higher-order thinking skills.

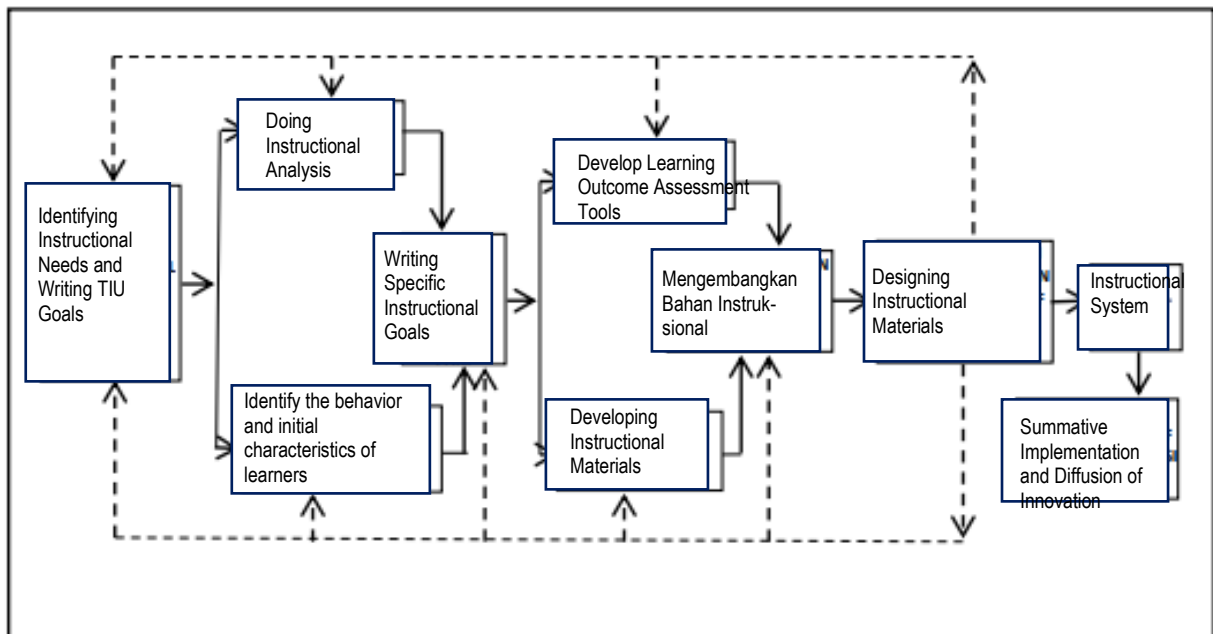
This Preliminary Research was conducted to obtain an overview of the effect of the ELPSA learning approach (Experiences, Language, Pictures, Symbols, and Applications) on students' ability to understand concepts and solve problems. Based on the results of the study, it shows that the ELPSA approach which includes experiences, language, pictures, symbols, and application has an effect on each indicator of concept understanding, namely indicator I (93.43%) students are able to restate a concept at the experiences and language stages, indicator II (92.93%) Students are able to give examples and non examples on a concept at the language and pictures stage, indicator III (91.08%) students are able to classify objects according to certain

characteristics according to the concept at the pictures and symbols stage, indicator IV (89.20%) students are able to present concepts in various forms of mathematical representation at the symbols and application stage.

The ELPSA of approach includes experiences, language, pictures, symbols, and applications that affect every aspect or indicator of problem solving ability, namely indicator I (94.44%) of students being able to understand problems at the stages of experiences, language, and pictures; indicator II (91.16%) students are able to draw up a plan of completion at the pictures and symbols stage; indicator III (88.13%) students are able to carry out the completion plan at the symbols and application stages; indicator IV (87.12%) students were able to review the completion of the pictures, symbols and application stages. Furthermore, the results of the descriptive analysis showed that: (1) there was an increase in students' conceptual understanding after the ELPSA learning approach was applied; (2) there is an increase in students' problem solving abilities after the ELPSA learning approach is applied; (3) the score of understanding the concept after applying the ELPSA of learning approach meets the criteria for completeness, which is more than 80; (4) the problem-solving ability score after applying the ELPSA of learning approach meets the criteria for completeness, which is more than 80; (5) complete understanding of students' concepts after the classical completion of the ELPSA learning approach is applied, reaching 97%; and (6) the completeness of students' problem solving abilities after the application of the classical ELPSA learning approach is complete, reaching 91%. The results of inferential analysis show that the application of the ELPSA learning approach (Experiences, Language, Pictures, Symbols, and Applications) has an effect on students' understanding of concepts and problem solving.

Method

The type of research used in this research is research and development. The development model chosen is the development of learning design that refers to the Instructional Development Model (MPI) by Suparman (Amir & Kusuma W, 2018). This research was carried out in the 2021-2022 academic year at SDN Sangir Makassar City. The subjects in this study were fifth grade students at SDN Sangir Jl. Sangir Makassar. The design in this study can be described as follows:



Sumber : (Rahmawati & Suhendri, 2016)

Figure 1 Instructional Design Model

The instruments used in this study were test instruments and questionnaires. The test instrument is used to see student learning outcomes after developing the learning design, while the questionnaire is used to see student responses after developing the learning design.

The way to obtain data in this research is to use tests and questionnaires.

- 1) Test, the test instrument is used to obtain data about student learning outcomes after developing learning designs

2) Questionnaire, questionnaire instrument or questionnaire is a number of written questions that are used to obtain information from respondents about the learning design that has been developed.

Data analysis technique

Test Instrument Validity Analysis

$$CVR = \frac{n_e - \frac{N}{2}}{\frac{N}{2}}$$

Description:

CVR = Value of the validity of the content of the question

n_e = Number of respondents who said Yes

N = Total respondents

Student Response Analysis

$$P = \frac{f}{n} \times 100$$

Description:

P = Percentage of Answers

f = Answer Frequency

n = Number of Respondents

Research Procedure

The first stage, identifying which consists of three steps as follows:

- a. Identify instructional needs and write general instructional objectives
- b. Conducting instructional analysis
- c. Identify the behavior and initial characteristics of learners.

The second stage, developing which consists of four steps as follows:

- a. Write specific instructional goals;
- b. Develop learning outcomes assessment tools;
- c. Develop an instructional strategy;
- d. Develop instructional materials.

The third stage is evaluating and revising which consists of one step, namely preparing designs and carrying out formative evaluations which include revising instructional materials.

Results and Discussion

The procedure for developing teaching materials in the form of worksheets using the ELPSA framework is carried out with a development model consisting of the analysis, design, development, implementation, and evaluation stages. Based on the development research conducted, the following research results were obtained:

1. Stage of Analysis (Analysis)

One of the problems that exist in schools today is the limited number of teaching materials or learning materials that can facilitate students to build their knowledge independently. Based on the results of observations that have been made at SDN Sangir Makassar of City, the teaching materials in the school are only teacher handbooks and some old LKS which are full of doodles and the material is still not updated. So that in this study, material analysis was carried out. The material is taken for the development of learning worksheets with the ELPSA framework is adapted to the curriculum syllabus at the Education Unit Level (KTSP). In addition, the material in the LKS is adapted to the ELPSA framework, meaning that the learning LKS developed will contain five components or elements of the ELPSA framework because the ELPSA framework is a systematic work that is sequentially supported by learning methods as well as in its application.

2. Stage of Design (Design)

The next stage in this research is the design stage. The results of product design (learning worksheets) The design of worksheets with the ELPSA framework starting from E, L, P, S, and A are:

- a. Experiences (E) = Experience

Experiences are learning activities that make explicit or bring up previous experiences that students have and connect them with new knowledge and experiences that will be obtained.

b. Language (L) = Language

Language (language development) is a learning activity that actively develops the language of a particular subject so that it is interpreted by learners. Language is used to encourage understanding. In science, language can be general or specific and is needed to present bright ideas.

c. Pictures (P) = Pictures

Pictures (image representation) is a learning activity that provides the experience of recognizing concepts in the form of images. Image representation (the "P" component of ELPSA) can be used to stimulate students to think mathematically and systematically.

d. Symbols (S) = Symbol

Symbols (symbol representation) is a learning activity that can change or make the transition from image representation to symbol representation. The concept of a subject contains symbols, either in the form of formulas or abstract statements.

e. Application (A) = Application of knowledge

Application (the application of knowledge) is a learning activity that seeks to understand the significance of the learning process by applying new knowledge in solving problems in a meaningful context.

3. Development Phase (Development)

Learning worksheets that have been designed are then consulted with supervisors or experts. After the revision is done, then an assessment is carried out by the validator, namely the material expert validator and the media expert validator. The LKS that has been validated by the validator will then be used as a reference for making improvements to the product developed.

From this validation process, researchers obtained data from expert validators with a percentage of 82.85% included in the very good category. Therefore, it can be concluded that the learning worksheets developed are categorized as valid based on the results of the validation by the validator. In addition, from this validation process the validator also provides several suggestions to researchers for improvement (revision) of learning worksheets. Some of the suggestions that are more dominant are regarding the writing and accessories of the LKS developed.

4. Implementation Phase (Implementation)

From a limited trial, researchers obtained data about the practicality of learning worksheets and student responses to the tested worksheets. From the trials carried out, information was obtained that the LKS being tested was already practical. This is based on the tabulation of the results of the LKS evaluation by subject teachers who teach at SDN Sangir the percentage is 81.50% included in the Very good category. In addition, the learning worksheets that were tested also received a good response from students. It is based on the tabulation of the results of student responses to the LKS obtained an average of 73.90%.

5. Stage of Evaluation (Evaluation)

After doing the test, the next step is to evaluate the product. During the trial process, suggestions and input from teachers and students were accommodated to be used as improvements or revisions to teaching materials in the form of developed learning worksheets. Based on the results of the development research that has been described, the development of teaching materials carried out with the steps of a development model consisting of the analysis, design, development, implementation, and evaluation stages produces worksheets learning with the ELPSA framework to improve the critical thinking skills of Class V students at SDN Sangir with valid and practical criteria. The development of learning worksheets aims to obtain valid and practical learning worksheets. However, at the implementation stage it is not very optimal. This was due to the fact that only one trial was conducted. Meanwhile, to get maximum development results, based on a quote from Tegeh (2014) in (Andira: 2015) states that at the implementation stage information is obtained

about the effectiveness of the product being developed. However, in this research and development, no information was obtained about the effectiveness of the developed learning worksheets. In addition, at the evaluation stage, this research and development did not reach the summative evaluation process (wider) and only achieved formative evaluation. This is done because based on Tegeh (2014) in (Andira: 2015) states that in development research generally only formative evaluation is carried out, because this type of evaluation is related to the development research stage to improve the resulting product development.

Therefore, in this study the validity of the learning worksheets developed was seen from the results of the validator's assessment, the validation sheet contained aspects of format, content, language, ELPSA, indicators of critical thinking ability, simplicity, integration, balance, shape, and color. While the practicality of the learning worksheets is seen from the assessment of the worksheets by the subject teachers at SDN Sangir.

The validity of the learning worksheets that have been developed refers to the results of the validator's assessment. The percentage score from the material expert validation of 82.85% is included in the very good category. As for the practicality of learning worksheets, it refers to the results of the evaluation of student worksheets by subject teachers at SDN Sangir. The percentage score from the LKS evaluation is 81.50% which is included in the very good category. Therefore, it can be concluded that the practical learning worksheets are to be used in learning.

Based on this description, the learning worksheets with the ELPSA framework were declared valid and practical and received a very good response from students with an average total score of 73.90%. The results of the comparison of the two learning outcomes tests given, namely pretest and posttest, are 54.3: 91.2. Meanwhile, based on the percentage of completeness of 91.2%, it is included in the highly improved category. Therefore, based on the comparison results and the percentage of completeness obtained from the learning outcomes tests that have been carried out by researchers, it can be seen that the learning worksheets that have been tested can improve students' learning outcomes.

On the other hand, based on the results of the evaluation from the Analysis stage to the Implementation stage, it can be concluded that the developed learning worksheets are valid. In addition, for the practicality of learning worksheets, practical criteria are obtained and get a good response from students and can improve student learning outcomes.

The development of this learning design aims to obtain a valid and practical learning design. However, at the implementation stage it is not too optimal. This is because the research was only conducted once with limited time and resources. On the other hand, based on the quote from Tegeh (2014) in (Andira, 2015), the implementation stage captures information about the effectiveness of the developed product to achieve maximum development results. However, this research and development does not provide information about the efficacy of the learning modules developed. Moreover, at the evaluation stage, this research and development does not lead to a summative evaluation process (broadly defined), and only formative evaluation can be achieved.

According to Haviz (2013), learning products are concluded to be valid if they are developed with adequate theory, called content validity. And all components of learning products are related to each other consistently, called construct validity. According to Nieven in Haviz (2013), the product as a result of the development is concluded to be practical if the practitioner states that the product can theoretically be applied in the field, and the level of product implementation is in a good category. Meanwhile, based on Pohan (2014), the results of product validation are seen from the content aspect, linguistic aspect, presentation aspect, and gravika aspect. It is contained in the validation sheet. While the practicality of the product can be seen from the questionnaire given to students and teachers.

Conclusion

As for conclusions in this research and development are as follows: 1) Learning worksheets are feasible to use with validation results of 82.85%. 2) Practical learning worksheets are used in the learning process with validation results of 81.50%. 3) The student responses very good to the learning worksheets used are 44.96%. Furthermore, the percentage of completeness of student learning outcomes of 91.2% is included in the highly increased category. Therefore, based on the results of the evaluation from the Analysis stage to the Implementation stage, it can be concluded that the developed learning worksheets are valid. In addition, for the practicality of learning worksheets, practical criteria are obtained and get a good response from students and can improve student learning outcomes.

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