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# Empowering Grade 5 Students with Computational Thinking Skills: A Comprehensive Learning Design

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**Abstract.**

This study addressed the need for teachers to establish learning design guidelines for effective teaching and to equip students with computational thinking skills. Specifically, the study aimed to achieve two main objectives: 1) to develop a computational thinking-based learning design centered on five sub-themes intended for fifth-grade elementary school students and 2) to assess the quality of the learning above design. The study involved thirty-three students from Kanisius Wirobrajan Elementary School (SD Kanisius Wirobrajan). The research findings revealed that: 1) a learning design based on computational thinking, which incorporated the Analyze, Design, Development, Implement, and Evaluation steps, was created for the fifth-grade elementary school students under five sub-themes, and 2) the overall quality of the learning design, assessed via validation by two lecturers and a teacher, was "very good" with a score of 3.61, with the recommendation that "small revisions" be made. Additionally, the quality of the learning design product based on implementation validation by a teacher was "very good," with a score of 3.93, and it was deemed not to require any revisions. The study's limited trial yielded encouraging results, with all students completing the learning design activities and enhancing their computational thinking skills.
Keywords: Computational Thinking Skill; Learning Design; Fifth-Grade Elementary School

## 1. Introduction

We live in the 21st century, an era characterized by rapid technological and informational development and a critical approach to problem-solving known as computational thinking (CT). [1] states that CT simplifies complex problems using computer science concepts and techniques. By mastering this approach, individuals can develop critical thinking, creativity, communication, and collaboration skills required for effective problem-solving. There are two ways to apply CT: plugged and unplugged. Plugged activities require a computer, while unplugged activities are carried out without a computer, such as through direct activities, games, and exploratory challenges [2]

Four key aspects of CT are identified that support problem-solving skills: decomposition, pattern recognition, abstraction, and algorithms [3]. Students from elementary to intermediate levels can develop solutions to complex problems by mastering these four aspects. In Indonesia, CT has been recognized as a new literacy of the 21st century and will be implemented in the Merdeka Curriculum [4]. Therefore, the education sector must design curricula and learning environments that enable students to acquire globally competitive skills. Teachers need to incorporate CT into their subjects to promote critical thinking in different ways, analytical skills, and self-expression [5].

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Incorporating computational thinking (CT) into the curriculum is difficult and can pose challenges for teachers. Teachers must put in extra effort to develop CT skills which can lead to less diverse learning environments and, ultimately, affect students' interest in learning [6]. To overcome this challenge, a learning design that integrates CT has been proposed as an effective solution to enhance students' knowledge and skills in achieving the learning objectives [7]. The learning design was developed using the unplugged method, which generates activities without a computer. A theme is also developed for the learning design through interviews with fifth-grade teachers. The theme analysis resulted in the "Ecosystem Balance" subtheme for Lesson 1, which covers Indonesian language and Natural Sciences content. Lesson 1's subtheme addresses a problem that often occurs in nature, and students can help solve the issue in the surrounding environment using the materials in the learning design.

Despite the potential benefits of CT-based learning, its implementation still has challenges. For example, a fifth-grade teacher at Kanisius Wirobrajan Elementary School reported difficulties in understanding the application of CT-based learning designs, preparing appropriate designs, implementing them due to a lack of references, and finding relevant learning design references that can integrate CT into the classroom and create a fun learning environment [8]. However, research suggests that CT-based learning can improve students' high-order thinking skills [9][10]. Therefore, teachers must continue to strive to incorporate CT into their lessons to promote critical thinking, creativity, communication, and collaboration skills among their students.

Based on the explanation above, the purpose of this research was twofold: firstly, to describe the development procedure for creating a CT-based learning design, and secondly, to assess the quality of the resulting design.

## 2. Method

The research and development (R&D) method was employed by the researchers for this study, which focuses on developing a product and evaluating its effectiveness. The ADDIE model is used, which stands for Analyze, Design, Development, Implement, and Evaluate [10]. This model was chosen due to its practicality and interrelatedness at each stage. The ADDIE model involves five stages, the first being analysis, where a needs analysis is conducted to identify problems and determine suitable solutions. The second stage, design, involves creating a product design. The third stage, development, involves developing the product based on the design. The fourth stage, implement, involves testing the product, and the final stage, evaluate, involves analyzing the product's success and improving its implementation. To align with the ADDIE model, the researchers adopted a student-centered, innovative, and creative approach to education based on the educational philosophy that learning should be relevant and authentic for students.

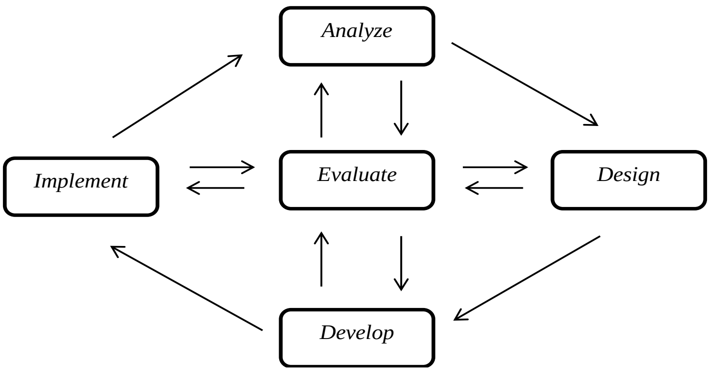


**Figure 1. ADDIE Research Design**

### *Setting and Subject Research*

This research project focuses on developing a learning-based design that emphasizes computational thinking for fifth-grade elementary school students. The limited product trial was conducted at Kanisius Wirobrajan Elementary School in Yogyakarta and involved 33 students from grade 5. The primary goal was to optimize students' thinking patterns in this age group and provide teachers with a reference for designing computational thinking-based lessons. The research was conducted from September 2022 to February 2023, and data was collected through interviews and questionnaires.

### *Instruments and Data Collecting*

The research utilized interview sheets with 16 questions that assessed five indicators. The resulting data was then analyzed and presented in a grid table format included in this study.

**Table 1.** Interview Grids with Class V Elementary School Teachers

| Indicator | Question Topic | No Item |
|---|---|---|
| Way to teach | Teaching model. | 1-3 |
| CT urgency | Knowledge about *computational thinking* | 4-7 |
| Compilation of CT-Based Learning Designs | A learning design based on *computational thinking* was implemented in a fifth-grade elementary school classroom.<br>Difficulties and efforts to overcome difficulties in preparing learning-based designs *computational thinking.* | 8-14 |
| He | An appropriate theme for design-based learning *computational thinking.* | 15 |

| | | | |
|---|---|---|---|
| ! | Expected results | Development of learning-based design *computational thinking* for grade V SD. | 16 |

To assess the quality of the product and to improve it, a product validation questionnaire is utilized as a benchmark. This questionnaire is comprised of 70 statements that are targeted toward expert lecturers in computational thinking as well as fifth-grade elementary school teachers. Conversely, the validation instrument used to implement the learning design product is intended only for one fifth-grade elementary school teacher and consists of 45 statements. To assess each statement in the validation process, a Likert scale ranging from 1 to 4 is used, with 1 indicating "not good," 2 indicating "sufficient," 3 indicating "good," and four indicating "very good." The product validation questionnaire and product implementation validation grid can be found in the following table. These tools were instrumental in evaluating the product's effectiveness and improving its quality.

**Table 2.** Product Validation Questionnaire Grid

| Variable | Indicator | No Item |
|---|---|---|
| *Cover* | Title and identity | 1 |
| Initial Section | Preface | 2 |
| | Learning Design Information | 3 |
| | List of contents | 4 |
| Core Section | Subject Identity | 5 |
| | Indicator | 6-10 |
| | Objective | 11-13 |
| | Teaching Materials | 14-19 |
| | Models and Methods | 20-28 |
| | Instructional Media | 29-35 |
| | Learning Activities | 36-43 |
| | Evaluation questions | 44-47 |
| | Worksheet | 48-53 |
| | Assessment | 54-57 |
| | Learning Compilation Criteria | 58-64 |
| Final Section | Closing | 65 |
| | Bibliography | 66 |
| | Author Information | 67 |
| Language | PUEBI appropriate language | 68 |
| Presentation | Complete and easy to read | 69-70 |

**Table 3. Product Implementation Validation Questionnaire Grid**

| Variable | Indicator | No Item |
|---|---|---|
| Introduction | Apperception and Motivation | 1-3 |
| | Explain the Competency and Activity Plan | 4-5 |
| You | Material Mastery | 6-9 |
| | Strategy Implementation | 10-15 |
| | Applying the Scientific Approach | 16-22 |
| | Application of THEMATIC Learning | 23-26 |
| | Application of Based Learning *Computational Thinking* | 27-30 |
| | Student Engagement | 35-39 |
| | Language | 40-41 |
| Closing | Closing Learning | 42-45 |

The reflective sheet to determine the response of students and determine the ability of students to carry out each activity.

**Table 4.** Reflective Sheet

| Question |
|---|
| How did you feel during the learning process? |
| What activities do you find difficult to do? |
| How did you overcome these difficulties? |
| What activities do you find easy to do? |
| What activities do you find interesting and easy to do? |
| What are the benefits for you of the learning that has been done? |

### *Data Analysis*

This study utilized both qualitative and quantitative data analysis techniques. Qualitative data was collected through needs analysis and reflective sheets, which provided descriptive explanations. On the other hand, quantitative data was obtained through product validity testing. The product validity testing involved a closed questionnaire sheet validated by two computational thinking expert lecturers and one fifth-grade elementary school teacher. The questionnaire used a Likert scale with four component assessment scores: 1) not good, 2) fair, 3) good, and 4) very good. The scores were then averaged to obtain the overall validation results. The formula used for calculating the average validation score is included in this study.

$$\text{Nilai rerata} = \frac{\text{jumlah skor yang didapat}}{\text{jumlah item yang dinilai}}$$

**Figure 2. Average Value Calculation Formula**

After the researcher gets the average rating for each component by adding all the scores, the score is divided by the number of items assessed. Then the final average value of product validation by the validator is obtained by calculating the formula below.

$$\text{Skor rerata akhir} = \frac{\text{jumlah skor rerata instrumen validasi produk}}{\text{jumlah validator}}$$

**Figure 3. Final Value Calculation Formula**

After the results are obtained, each value is converted into qualitative data on a scale of four to assess learning design products using criteria. The rules for scoring and categories of assessment results are as follows (Widoyoko, 2014: 144):

**Table 5**. Convert Quantitative Data to Qualitative

| No | Score Range | Category |
|---|---|---|
| | 3,26 – 4,00 | Very good |
| | 2,51 – 3,25 | Good |
| | 1,76 – 2,50 | Not good |
| | 1,00 – 1,75 | Not very good |

## 3. Result and Discussion

The procedure for product development of learning design for Grade 5, Theme 5, Subtheme 3 uses the ADDIE model research steps: *analyze*, *design*, *development*, *implement*, and *evaluation.*

***Presenting the Results***

### Analyze

The first stage carried out by researchers is needed analysis through interviews. This stage corresponds to the first stage of ADDIE, i.e., analysis [11]. Needs analysis is done through interviews. This interview researchers conducted directly face to face. The resource person in this interview was a class V teacher at a private elementary school in Yogyakarta who had previously attended training in computational *thinking.* Interviews were conducted to learn how to teach teachers urgent *computational thinking*, preparation for learning design-based *computational thinking*, and know the appropriate theme to develop in the product—*moreover,* expected results, along with suggestions from teachers on product development. The results of the interviews show that 1) the learning model that is often used is more problem-based to train critical thinking skills, 2) teachers often apply the PBL learning model, but the PJBL learning model is rarely used, 3) the teacher has attended training *computational thinking*, 4) the teacher said *computational thinking* This is one of the skills to shape students' way of thinking in solving problems, which can educate students' skills, 5) *computational thinking* has a characteristic that is to train students to think critically, and find ideal solutions to solve problems, 6) the teacher conveys that *computational thinking* needs to be applied in learning at school so that it can shape the way of thinking of students, 7) the teacher says that the application of learning *computationatl thinking* in class are still considered complicated and difficult to understand, and teachers also say they experience limitations when implementing based learning*computational thinking*, due to lack of references, 8) difficulties experienced when teachers have to collaborate on 4 stages*computational thinking* with the KD specified, and are still confused when compiling lesson plans, whether the learning steps are made first and then adjusted to the 4 stages, or vice versa, 9) the teacher's efforts to overcome these difficulties by looking for references both from books and internet sources, 10) in compile the teacher's lesson plans personally, 11) the teacher says so far for the current fifth grade, learning *computational thinking* is in accordance with class conditions, 12) the teacher conveys that students have the ability to think critically, for students who are used to them they will be thorough, trained, and feel challenged with questions *computational thinking*. However, some students are still not used to it; in this case, the teacher must be patient in guiding; 13) The teacher has plans in the future to design learning-based *computational thinking*, to shape the way of thinking of students with aspects that are in *computational thinking,* 14) the teacher also said he needed a learning design reference that was able to integrate classroom learning with *computational thinking*, in order to be able to create enjoyable learning, which was able to adapt to the applicable curriculum, 15) the teacher said that if in the trial month, namely in November on the material in theme 5, then raised theme 5, subtheme three regarding ecosystem balance. The fifth-grade elementary school teacher agreed with the idea that the researcher put forward and strongly supported the ecosystem theme to be used as a learning-based design *computational thinking*, with the hope that this material will help students understand related to ecosystems and life processes in nature that often appear in the natural environment, and 16) learning design that is expected if students can do their best, such as when the teacher gives assignments students can quickly compete.

### Design

The next stage is designing products in the form of learning designs. This stage corresponds to the second stage of ADDIE, namely *design* [11]. At this stage, the researcher compiles a product design. The product to be designed is a learning design in line with the teacher's needs through loading-based activities and *computational thinking* in a thematic lesson. The researcher made a learning design grid aligned with a needs analysis in the early stages. The product grid begins by determining a theme adapted to the semester program, subtheme, and materials. Through interviews with teachers, the themes that will be developed are Theme Five and Subtheme 3; then, researchers will formulate core competencies, basic competencies, indicators, learning objectives, and learning models adapted to the material. According to Bloom's taxonomy, indicators are formulated by analyzing the level of competence to be achieved. Learning objectives adjust the indicators prepared, including ABCD, and infuse aspects of *computational thinking* placed in section *condition*. The learning model used is *problem-based learning* to improve reasoning ability, as well as the curiosity of students. After that, design learning activities, determine the media to be used during the learning process, and complete all the learning design components. This learning design section consists of 3 parts: the beginning, core, and end. The beginning of the learning design contains 1) a cover, 2) introductory words, 3) an introduction to based learning design *computational thinking*, and 4) a table of contents. The core part of the learning design contains 1) lesson plans, 2) teaching materials, 3) learning media, 4) evaluation questions, 5) worksheets, and 6) an assessment. RPP contains 11 components according to Permendikbud No 22 of 2016, namely 1) lesson plan identity, 2) KI, 3) KD, 4) achievement indicators, 5) learning objectives, 6) teaching materials, 7) learning models, 8) activities learning, 9) assessment, and 10) learning resources.

The teaching materials section is designed based on the specified competencies, which contain a brief description, relevance, learning outcomes, and a complete description of the material taught to students. In the learning media section, researchers use presentation materials in the form of *PowerPoint.* Besides that, the researcher also included several videos related to the theme of ecosystems, made paper animal pictures to divide students into several study groups, included two nonfiction text reading materials, cut sentence cards filled with nonfiction reading texts, several pictures of living things in the paddy field ecosystem, and food chain song In the evaluation questions section; the researcher included five questions on the Indonesian language subject and five questions on the Natural Sciences subject. So that the total number of questions given to students amounted to 10, with the type of multiple-choice questions, tricky multiple-choice questions, and descriptions. The questions given are adjusted to the learning material based on *computational thinking.*

In the LKPD section, the researcher listed several individual and group activities. In the first activity, individual activities by outlining answers related to the questions given. Then, in the activities of the two Indonesian subjects, namely group activities, in this activity students analyze the main sentences and explanatory sentences in a reading of nonfiction texts by taking the pieces of paper that have been provided and pasting them on the group worksheet after completing In this activity students discuss the questions that have been provided in the worksheet. In the third activity, students make mind maps individually; students listen carefully to reading texts and are asked to mark by underlining important sentences using colored pens, after that students make mind maps containing important information and conclusions from each paragraph using their language and decorate according to the creativity of students. In the fourth activity, in science subjects, namely group activities by compiling steps in making pictures of food webs written on worksheets, these steps will guide students to compile and do works. Next, students arrange the available pictures into food web events in the paddy field ecosystem, accompanied by a description. After that, students discussed with each other analyzing each question available on the worksheet.

The section contains three assessment domains: attitudes, knowledge, and skills. Ultimately, it contains 1) closing remarks, 2) a bibliography, and 3) an author profile. Ultimately, it contains 1) closing remarks, 2) a bibliography, and 3) an author profile.

### Development

The next stage do product *development*. This stage corresponds to the third stage of ADDIE, namely *development* [11]. The researcher carries out the initial stage to develop a product that follows the previous design. Researchers develop sources that can support product development. Researchers make this learning design using an application *word*, the researcher includes images to support the illustration of the learning design, and the appropriate color settings and designs are also interesting. Researchers also co*vered* the learning design following the ideas designed by previous researchers, which are made using *Canvas.* Apart from making *the cover*s, researchers also use the application *Canva* to design several other things, such as making worksheets, teaching materials, or media reading materials full of colors, pictures, and animations, with the hope that students will be enthusiastic about working on them. Researchers use the application *Canvas* because it has full features and is easy to use.

In addition, researchers also pay attention to the type and size of letters that are appropriate for the teacher's needs. After all parts of the contents of the learning design were put together, the researcher realized the learning design in a printed form. Researchers also guide supervisors to get directions and suggestions before the product is assessed and submitted to the validator. Furthermore, the learning design will be validated through validation instruments prepared by researchers, then addressed to important parties: two expert lecturers *in computational thinking* and one teacher of class V SD. Product validation aims to determine the feasibility of learning design products before being tested directly in class. After being validated, it is repaired according to the section, and the validator gives suggestions to meet product needs.

### Implement

The next stage is implementing or testing the product. This stage corresponds to the fourth stage of ADDIE *implementation* [11]. The trial was conducted on 29 November 2022 involving 33 fifth-grade students at Kanisius Wirobrajan Elementary School. Researchers carried out face-to-face trials for approximately 4 hours. A few days before the trial started, the researcher prepared various things such as asking permission from the fifth-grade elementary school teacher, printing learning designs, preparing media, tools, and materials to be used, and printing worksheets, evaluation questions, and reflective sheets for students. During the trial, the researcher briefly explained *computational thinking* to students to add insight, then proceeded to activities planned in the learning design.

While the trial was in progress, the researcher saw some interesting things the students were doing. It can be seen when students actively ask questions during the learning process when there is something they do not understand. Some students dare to express their opinions, as evidenced by the many responses given by students when researchers ask questions. When they are in a high class, students have a sense of curiosity and a sense of wanting to learn about something they do not know yet [12]. Curiosity is an initial stage in the knowledge possessed by each student. Knowledge begins with curiosity [13].

In addition, the researcher also saw that students could complete the activity of analyzing main and explanatory sentences correctly. In this activity, students can group main and explanatory sentences by attaching them to the worksheets provided. It is in line with Piaget's theory [14] which states that when they are in high grades, students have a characteristic of being able to group. Another interesting thing during the trial was when students discussed with each other in groups to determine the order in carrying out an activity to take pictures of food webs. Students realize that if they do not correctly determine the sequence, the results of the food web picture will not be optimal. It is in line with Piaget's theory based on [15] which states that when they are in high grades, students have a characteristic of being able to determine the order.

After the trial was completed, the researcher evaluated by asking several things the students, which were conveyed in reflective sheets. The researchers also distributed reflective sheets to the students to find out the responses of the students and the abilities of the students while doing based learning *computational thinking*. However, the questions on the reflective sheet that the researcher made needed to be more detailed, so the researcher experienced quite a few problems in processing the trial data. The advice obtained in dealing with these obstacles is that researchers must process students' reasons for choosing activities that they think are the most difficult and interesting to do based on the results of answers to questions students do.

An explanation of why students chose several activities when completing activities in the learning design developed through the answers to questions students worked on, 1) students chose the most difficult activity, namely the activity of making pictures of food webs. Based on the answers to the questions the students worked on, the students still incorrectly stated the levels in the food web, so there were still some incorrect answers in making food webs. Even though some activities were stated to be difficult to do, students continued to work on and completed them according to the allotted time and in various ways to overcome the difficulties they experienced, namely working well together in groups, dividing tasks into groups, not playing, and focusing on completing the activity. It shows that students can overcome existing difficulties in their way and with creativity; 2) then students choose the activity of analyzing main sentences and explanatory sentences as activities that are easy to do, based on the answers to questions students do almost the entire group can do it correctly, they are already able to find the characteristics of main sentences, and explanatory sentences so that it will make it easier for students to find pieces of sentences, and attach each main sentence, and explanatory sentences found in the worksheet available, 3) students choose the activity of making mind maps as an interesting activity to do, based on reflections at the end of learning choose these activities because students are allowed to develop any important information using their language, students are also given the freedom and to form and decorate a mind map with their creativity. As long as students carry out the activities or assignments given, the researcher guides and directs students to complete all activities correctly.

Figure 4. Implementation Of Product Trials in Class

At the end of each activity that has been carried out, the researcher also asks students to determine aspects of computational thinking that were developed in this activity. However, some students still needed clarification about answering, and some dared to answer but needed to be corrected in conveying aspects of computational thinking. It is because students need to learn more about computational thinking. Researchers realize that students can understand their activities related to every aspect of learning computational thinking. However, they need to know the different aspects of each activity consciously. Therefore, researchers help explain aspects of computational thinking obtained by students when completing each activity so that students become more understanding.

### Evaluation

The last stage carried out by researchers is to evaluate. This stage corresponds to the last stage in the ADDIE model, namely *evaluation* [11]. At this stage, the researcher will describe the results of product validation in the form of a learning-based design computational thinking theme with five subthemes 3 for class V SD. This evaluation is divided into two, namely formative evaluation and summative evaluation. The formative evaluation is evaluated at each stage of the ADDIE model. Researchers conduct formative evaluations to collect data from each stage used for product improvement. Then, a summative evaluation is carried out to determine the effect of the product on student learning outcomes and the quality of learning in it broadly. Summative evaluation describes product validation results by two computational thinking experts and one class V SD teacher.

#### *Quality of Learning Design*

The quality of product-based learning designs computational thinking with the theme five subthemes 3 class V SD can be seen through the criteria for preparing lesson plans. In the design-based learning computational thinking with the theme five subthemes 3 for class V SD containing a Learning Implementation Plan that has met the criteria for preparing a learning plan according to [16]. The following is a description of the six criteria for preparing the plan.

a. Significance
   Learning Implementation Plans (RPP) in learning designs are prepared with significant value. Learning steps are made effectively and efficiently so that the learning process runs smoothly. Each learning step has a meaning that is tailored to students. So, as a result, if one of the most important learning steps is not fulfilled, then the whole learning process will be less than optimal so that the RPP that the researcher has prepared can be used as a guide in the learning process in class V on theme 5, subtheme three based on computational thinking.
b. Relevant
   The researcher compiled the RPP by the applicable curriculum, namely the 2013 Curriculum, and applied the principles of active, fun, innovative, creative, effective, and fun learning (PAIKEM), in this case paying attention to students' learning styles and students' abilities.
c. Certainty
   Based on computational thinking, the researcher compiles definite learning steps to be implemented or used as a guide in the learning process in class V on theme 5, subtheme 3. Thus users of learning designs no longer have to choose alternatives in practicing lesson plans. However, you can develop lesson plans according to your needs and the learning objectives.
d. Adaptability
   The RPP the researcher, compiled is flexible and can be used in various situations. Therefore, users who use this learning design can implement lesson plans without having to fulfill the requirements that must be met fully.
e. Simplicity
   The prepared lesson plan is simple, making it easy to understand and practice. If the RPP is too complex and difficult to implement, it will not work well for users of learning designs.
f. Predictive

The prepared lesson plans have strong predictive power to be able to overcome various possibilities that arise. The prepared lesson plans can also be used for online or offline learning processes according to the teacher's needs. In addition, lesson plans are also prepared to facilitate students to understand better learning in theme 5, subtheme 3, with skills in computational thinking.

***Create a Discussion***

In addition, the quality of the learning design product can be seen from the validation results obtained from the overall average score by the three validators, which shows a result of 3,61 in the very good category. In addition, the results of the validation regarding the implementation of the product, which was carried out directly by the fifth-grade elementary school teacher, obtained an average score of 3,93 in the very good category. Based on this validation, the learning design product developed by the researcher is feasible to use with several revisions according to the suggestions from the validator.

Learning design is made to be a means to improve the quality of learning [17] and to train skills in 4 aspects *of computational thinking*; in line with Wing's thought [18] we must motivate, share joy, awe, and strength *computer science* until *computational thinking* became commonplace. The learning design aims to infuse students with the skills of all aspects *of computational thinking*, which they can apply to solve problems in their daily lives. The advantage of this learning design is that it briefly explains *computational thinking*, material regarding theme five and subtheme 3, complete RPP attached, and contains activities that can train the concept of thinking with aspects of *computational thinking*. Thus, readers or users of learning designs can directly implement learning designs or make guidelines in the learning process following the curriculum, which is thematic in theme 5, subtheme 3 in Indonesian language material, and IPA-based *computational thinking*. Weaknesses in this learning design only focus on covering material on Indonesian language learning and science with one discussion theme, namely ecosystems. However, this learning design can be used as a reference or other alternative in presenting learning based on *computational thinking*. It will be appropriate in this new era which is entirely related to a critical way of thinking that leads to concept *computational thinking.* The uniqueness of this learning design is that the activities presented are based on *student-centered computational thinking*. During the activity, a condition is created where students enthusiastically discuss each other, throwing ideas or ideas to make learning more active and meaningful. Another uniqueness is that there is an explanation of aspects of *computational thinking* developed in each activity, making it easier for readers to get to know various aspects of *computational thinking* through the activities carried out.

The learning design can be used as a reference for fifth-grade elementary school teachers in the learning process based on theme five, subtheme 3 in grade 5. This learning design is based on four aspects of *computational thinking,* namely decomposition, pattern recognition, abstraction, and algorithms, according to [19] through testing aspects *of computational thinking*, what is still weak is done on the algorithm aspect, namely when students have to arrange pictures of living things into food web events. In the aspect of decomposition, it can be carried out by students; some students correctly describe answers to the information they know. The strong aspect of pattern recognition is when students can analyze the differences between main and explanatory sentences. On aspects *of computational thinking*, abstraction is when students can conclude each paragraph in nonfiction text. This learning design adapts to 21stcentury learning, and remembering *computational thinking* has become literacy and is part of the Merdeka Curriculum

## 4. Conclusion

The learning design for computational thinking based on Theme 5 Subtheme 3 for fifth-grade elementary school students was developed following the ADDIE steps: Analyze, Design, Development, Implement, and Evaluation. The learning design product obtained a very good rating with an average score of 3.61 based on the validation process conducted. Furthermore, implementing the product by the fifth-grade elementary school teacher received an average score of 3.93 in the very good category. The validation results suggest that the learning design product is suitable for use with some revisions according to the suggestions provided. The learning design also includes six criteria for preparing appropriate lesson plans [20][21]. These results indicate that the learning design product developed through the ADDIE process is effective and suitable for teaching fifth-grade elementary school students computational thinking.

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