



## Designing an IPAS lesson plan with understanding by design approach for grade v elementary school

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| Article info                                                      | Abstract                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
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| Keywords:<br>Lesson plan,<br>understanding by<br>design,<br>IPAS. | This study presents the feasibility and validity of IPAS learning planning using the Understanding by Design (UbD) approach in a fifth-grade elementary school. This study uses a research and development (R&D) methodology that adopts the ADDIE model (Analyse, Design, Development, Implementation, and Evaluation). The data collection instruments were expert lecturer validity, teacher feasibility questionnaires, and student feasibility questionnaires, developed based on the review of the supervising lecturer and expert assessment. The implementation stage involved applying the developed learning plan to fifth-grade students at Karangsono 02 Public Elementary School. The trials at this stage included product validity and feasibility tests conducted by expert lecturers, classroom teachers, and fifth-grade students. The results show that the subject matter experts scored 91% in the excellent category, the learning planning experts scored 81% in the good category, and the teacher and student questionnaires were rated very feasible (93% and 87%). The evaluation stage included evaluations conducted at each stage of the ADDIE model. Data analysis techniques used triangulation. The results demonstrate that the IPAS learning plan, developed using the UbD approach, was valid and feasible for use in elementary schools, offering a valuable and innovative learning experience for teachers and students. |

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## 1. Introduction

Lesson plan is an essential aspect of teaching for teachers, because it is the first step for teachers, not only to plan teaching and learning activities within a certain time frame. However, a lesson plan also serves as the basis for determining the appropriate strategies, methods, and evaluation tools. Through comprehensive planning, teachers can ensure that learning objectives are achieved efficiently in daily and weekly learning. This way, learning will be more organised and efficient. In addition, the lesson plan must be based on the current curriculum, namely the Merdeka Curriculum. Through the Regulation of the Minister of Education, Culture, Research, and Technology Number 12 of 2024, the Merdeka Curriculum was officially established as the basic framework and structure of the curriculum for all educational units in Indonesia. One of the essential innovations in this curriculum is IPAS learning, an educational innovation in the Merdeka Curriculum that integrates science and social studies subjects. Learning objectives are to improve critical, innovative, and creative thinking skills, conduct investigations and experiments, communicate, draw conclusions, and reflect. To improve spiritual attitudes and continue the investigation process that has been carried out to solve problems. (Suhelayanti, 2023).

A lesson plan is a method that specialises in the conditions for learning to produce learning plans and implementation, both in the long and short term (Putrianingsih et al., 2021). Course outline is a written document that is systematically arranged, containing indicators that students must achieve, material delivered to students, and media that will be used in the learning process (Rosalina Noor, 2022). A lesson plan is part of educational planning and is essential in implementing learning (Farhang et al., 2023). The explanation that lesson planning is a schedule that guides teachers and student groups regarding the actions that must be taken at a specific time with specific lesson material (Rashad Ali Bin-Hady & Abdulsafi, 2018).

Learning, basically, is a manipulation of striving for students to develop and grow based on the intentions and goals of the educator. (Zagoto & Dakhi, 2018). The learning process can shape students' perspectives because it is influenced by interactions with the learning environment, making it a self-adjustment process to the changes students encounter. (Widyanto & Wahyuni, 2020). Learning is a systematic design carried out by educators to develop students' creativity and knowledge in certain subjects gradually. This affects student motivation and creativity. (Najah et al., 2025). Meanwhile, according to Rusman (2017), the learning process is planned to provide students with mental and physical experiences through interactions among students, between students and teachers, and between students and the environment and other learning resources to achieve desired learning outcomes.

In Indonesia's education context, student engagement in learning is challenging. The lack of active learning in the classroom is one factor causing low student achievement. (Astuti & Barratt, 2021). Meanwhile, (Marina et al., 2024) stated that many teachers face difficulties developing learning modules or lesson plans, such as evaluating learning outcomes and designing learning objectives. This is because learning outcomes must be prepared very carefully. Moreover, each stage must be designed meticulously. Based on interviews with fifth-grade teachers at Karangsono 02 Public Elementary School regarding lesson plans in the classroom, it was found that lesson plans such as learning modules, teaching materials, student worksheets, and assessment tools had not been prepared completely and systematically according to student needs. This is due to the large number of subjects that must be prepared, resulting in incomplete learning plans. This condition shows a gap between the ideal learning plan of the Merdeka Curriculum and actual practice in the field. Therefore, there is a need for crucial factors that can support the success of the learning planning process, namely, by using a learning planning

design developed by teachers, including an understanding of the design approach in learning, one of which is the Understanding by Design (UbD) approach.

The Understanding by Design (UbD) approach focuses on learning objectives, learning processes, and student understanding. (Pertwi et al., 2019), while according to (Wiggins & Mctighe, 2005) UbD is a framework used to design teaching and learning processes more focused on student understanding. The term UbD is the same as backward design, or Backward Design. According to (Newell et al., 2024) The backward design approach begins with identifying and describing the intended learning outcomes, followed by developing assessments, and ends with planning learning activities.

Research conducted by Ari Susanti et al., (2023) showed that English learning design at SMK N 2 Surakarta is based on the Understanding by Design approach and can be implemented by identifying desired outcomes, assessing evidence, and planning learning. Meanwhile, research by Pertwi et al., (2019) The review of physics teachers who became reviewers showed that this design can be used as an alternative learning design to improve the quality of education. The same thing was also done by Windya Wati, (2022) The results showed that 83%- 89% of students perceived the Understanding by Design approach as effective, increasing their motivation and activity during learning based on the three indicators measured. Utami, (2024) also been proven that the Understanding by Design approach has proven to be an effective approach.

Based on findings obtained through relevant research and interviews with fifth-grade teachers at Karangsono 02 Public Elementary School, relatively similar problems and objectives were identified. These conditions prompted the researcher to test the validity and feasibility of the IPAS learning plan design based on the Understanding by Design approach in the fifth grade at the school.

## 2. Method

This research was conducted using research and development (R&D). According to (Rahmawati & Zaka Hadikusuma Ramadhan, 2025), development is the process of creating new or improving existing products to refine them, and the product is further refined to produce a superior final product after field testing. The development process refers to the ADDIE model. There are five stages in the ADDIE model: (1) Analysis, (2) Design, (3) Development, (4) Implementation, and (5) Evaluation. (Nova et al., 2022). The ADDIE model was chosen because it has advantages in each stage, which always includes an evaluation process, so that in developing the IPAS lesson plan design with the Understanding by Design approach, researchers can evaluate its shortcomings from the start. This research was piloted at SD Negeri Karangsono 02, Mranggen District in Demak. The school still needs a lesson plan design with the Understanding by Design approach to assist teachers in making lesson plans that suit students' needs and can avoid content overload by focusing on enduring principles and key concepts essential for students to understand. The products are teaching modules, teaching materials, LKPD, assessment instruments, and learning media with the Understanding by Design approach. Limited testing was conducted on 15 students to determine the readability and attractiveness of the products made before being applied or implemented in real learning activities.

At the analysis stage, a needs analysis study on learning plan was conducted through observation, interviews, and questionnaire distribution. This stage was carried out to determine the needs of fifth-grade students and teachers at Karangsono 02 Public Elementary School related to the learning plan used during learning activities, the suitability of curriculum implementation, and classroom conditions.

At the design stage, researchers designed lesson plans using the Understanding by Design approach for IPAS subjects in fifth-grade elementary school. This was done through backward design using the 'WHERE TO' guidelines. a) 'Where and What' refers to teachers helping students to clearly understand the learning objectives, so that students also know the targets to be achieved. b) 'Hook the student' means teachers attract students' attention and enthusiasm by asking provocative questions. c) 'Explore, Equip, Experience' refers to determining the learning experiences and lessons that students will gain. d) 'Rethink, Revise, and Reflect' provides opportunities for students to rethink, review, and improve their understanding. e) Evaluate means teachers invite students to evaluate the learning outcomes. f) 'Be Tailored' refers to learning that is tailored to students' different needs, interests, and abilities. g) 'Be Organised' means teachers and students reflect on the learning activities that have been carried out.

At the Development stage, prepared products such as teaching modules, student worksheets, assessment instruments, and learning media are refined through the steps described above. (a) Following the established plan, the author combines the collected elements. After that, the researcher revises the learning plan design developed before validation. If deemed appropriate, the product is ready for validation. (b) Subject matter experts, learning planners, practitioners, educators, and students conduct a validity questionnaire on the developed product. The learning plan validity questionnaire covers the clarity of learning objectives, the appropriateness of the assessment form, the clarity of the activity flow, and the clarity and accuracy of terms. The material validity questionnaire covers aspects of material suitability with the independent curriculum, grammatical accuracy, and clarity of material distribution. The teacher response questionnaire covers several aspects of applying the Understanding by Design approach, materials and activities carried out in accordance with student characteristics, and learning design with Understanding by Design. Meanwhile, the student response questionnaire covers reactions to supporting or additional facilities. The purpose of validating the IPAS learning plan design using the Understanding by Design approach is to collect assessments and suggestions from subject matter experts, learning planners, and practitioners regarding the suitability of the strategy. (d) Weaknesses were found after receiving validation and input from experts. The next step is to improve the product in order to overcome existing weaknesses. After revisions, if the product achieves a good or excellent rating, it proceeds to the implementation stage.

The implementation phase was carried out in class V of Karangsono 02 Public Elementary School, Mranggen in Demak, involving 15 students as test subjects. During the trial, the researchers noted weaknesses and problems during the product's implementation, namely the need for teacher assistance to maintain a conducive classroom atmosphere and more time to prepare for learning. In addition, students were also given a response questionnaire regarding learning activities using the Understanding by Design approach. The trial duration was adjusted to the learning time in class, which lasted for two meetings. Each meeting focused on applying UbD, which included identifying learning objectives, determining evidence of achievement, and implementing learning experiences through mind mapping activities. The evaluation stage, the final stage in the ADDIE model, was carried out to provide feedback on the feasibility of the IPAS learning plan design using the Understanding by Design approach. If the learning activities were not optimal, revisions were needed to develop the learning plan. If no revisions are needed, the learning plan is deemed feasible. The validators were subject matter experts, learning plan experts, and practitioners. The test subjects were fifth-grade students at Karangsono 02 Public Elementary School, Mranggen in Demak, consisting of fifteen children who participated in the trial under the guidance and direction of the teacher.

Data collection techniques were carried out using data triangulation techniques through interviews with teachers, principals, and 15 students and questionnaires completed by teachers and students. The process of testing the validity and feasibility of the lesson plan design was carried out by lecturers from PGRI University Semarang and motivational teachers from Karangsono 02 Elementary School using several instruments, namely (1) a validation sheet for learning plan experts using the Understanding by Design (UbD) approach, which assessed the completeness of the plan structure, the clarity of the activity flow, and the integration of the UbD stages, (2) a validation sheet for learning plan material experts using the Understanding by Design approach, which evaluated the suitability of the content with the curriculum, the accuracy of the concepts, and the relevance to the learning steps, (3) a validation sheet for learning plan practitioners using the Understanding by Design approach, which assesses the feasibility of implementation in the classroom, ease of application, and suitability of teacher and student activities, (4) a teacher response instrument in learning activities, and (5) a student response instrument in participating in learning activities. Data analysis techniques use quantitative data to analyse data obtained from student questionnaires, expert validation, and practitioner validation of learning designs using the Understanding by Design approach. Additionally, the quality of the developed product can be assessed by converting the original quantitative scores into qualitative data in the form of a rating scale with the categories: Excellent, Good, Fair, Poor, and Very Poor. Meanwhile, teacher response questionnaires were analysed using qualitative data, consisting of questions related to learning activities in the classroom using the Understanding by Design lesson plan.

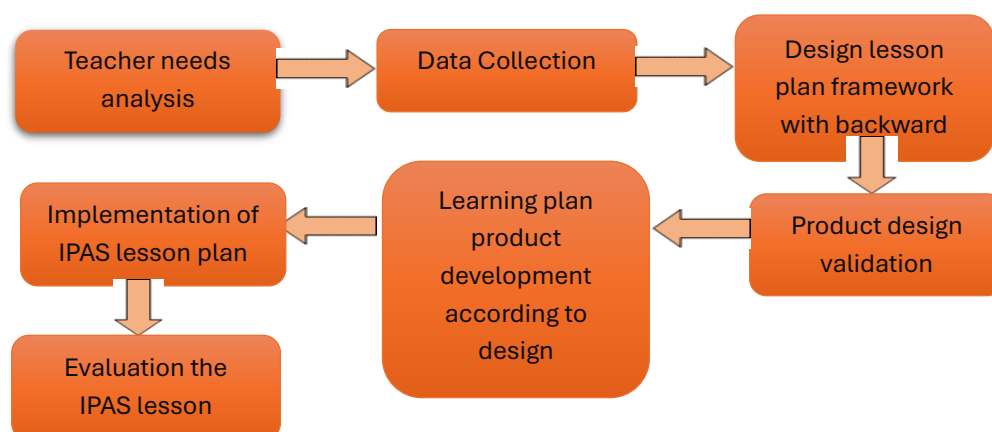


Figure 1. Chart of steps to design a lesson plan with understanding by design approach

This study has several limitations, including the use of a small sample size. This small sample cannot be generalised to a large and diverse population, so the research has low statistical power. This research was conducted only twice, with 1 study class, namely class V of Karangsono 02 State Elementary School. It requires more time to prepare for learning.

### 3. Results

Based on the research results, the design of the IPAS lesson plan with the Understanding by Design approach received a score of 81% from the learning planning expert with the Good category, received a score of 91% from the material expert with the Excellent category, received

a score of 93% from the practitioner with the Excellent category, received a positive response from the teacher in learning activities, and received a score of 87% from student responses related to learning activities with the Understanding by Design approach. This data was obtained from a questionnaire that researchers distributed to material expert validators, learning planning experts, practitioners, teachers, and students. The discussion related to the research results is as follows:

**Table 1.** Results of lesson planning expert validation

| No                                            | Aspects                                                                                                   | Rating Scales |    |    |   |    |
|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------|---------------|----|----|---|----|
|                                               |                                                                                                           | TB            | KB | CB | B | SB |
|                                               |                                                                                                           | 1             | 2  | 3  | 4 | 5  |
| 1.                                            | Clarity of learning objectives developed                                                                  |               |    |    | ✓ |    |
| 2.                                            | The suitability of the formulation of essential questions with the competence and context of the material |               |    |    | ✓ |    |
| 3.                                            | Accuracy of Learning Objectives explanation                                                               |               |    |    | ✓ |    |
| 4.                                            | Linkage between the Planning and the Backwards Design stages                                              |               |    |    | ✓ |    |
| 5.                                            | Clarity and measurability of learning outcome achievement indicators                                      |               |    |    |   | ✓  |
| 6.                                            | Appropriateness of the form of assessment with learning objectives and indicators                         |               |    |    | ✓ |    |
| 7.                                            | Appropriateness of assessment instruments with authentic assessment principles                            |               |    |    | ✓ |    |
| 8.                                            | Clarity of assessment criteria and assessment rubrics used                                                |               |    |    | ✓ |    |
| 9.                                            | Alignment of learning activities with the Project-Based Learning model                                    |               |    |    | ✓ |    |
| 10.                                           | Alignment of learning activities with the Pancasila learner profile                                       |               |    |    | ✓ |    |
| 11.                                           | Clarity of the flow of learning activities from the introduction, core, to the closing                    |               |    |    | ✓ |    |
| 12.                                           | Appropriateness of using media and learning resources that support the achievement of learning objectives |               |    |    | ✓ |    |
| 13.                                           | Creativity in designing meaningful and contextual learning activities                                     |               |    |    | ✓ |    |
| 14.                                           | The suitability of the learning plan with the real context in the classroom                               |               |    |    | ✓ |    |
| 15.                                           | Clarity and accuracy of the use of terms                                                                  |               |    |    | ✓ |    |
| 16.                                           | Sentences are organised logically, straightforward, and easy to understand                                |               |    |    | ✓ |    |
| 17.                                           | Consistency of scientific and formal language style in the preparation of learning plans                  |               |    |    | ✓ |    |
| Total Skor: 69                                |                                                                                                           |               |    |    |   |    |
| Grand Total: 85                               |                                                                                                           |               |    |    |   |    |
| Percentage: $\frac{69}{85} \times 100 = 81\%$ |                                                                                                           |               |    |    |   |    |
| Category: Good                                |                                                                                                           |               |    |    |   |    |

Data validation from Table 1 shows that the validation conducted by learning planning experts obtains an assessment percentage of 81% in the Good Category. The assessment provided by the learning plan expert indicates that the learning plan is suitable and can be utilised. Minor revisions suggested by lesson plan experts, including teaching materials, student worksheets, assessment instruments, and media designs, to make them more interesting and systematic. This can be seen from the alignment of learning activities with the project-based learning model, the clarity of the learning objectives developed, the alignment of essential questions with competencies and contextual content, the accuracy of learning objective explanations, the alignment of assessment formats with learning objectives and indicators, the clarity and measurability of learning outcome achievement indicators, the relationship between planning stages and backward design, as well as the language being easy to understand and having been categorised as Good.

Table 2. Results of material expert validation

| No                                            | Aspects                                                                                              | Rating Scales |    |    |   |    |
|-----------------------------------------------|------------------------------------------------------------------------------------------------------|---------------|----|----|---|----|
|                                               |                                                                                                      | TB            | KB | CB | B | SB |
|                                               |                                                                                                      | 1             | 2  | 3  | 4 | 5  |
| 1.                                            | Clarity of material distribution                                                                     |               |    |    | ✓ |    |
| 2.                                            | Numbering system                                                                                     |               |    |    | ✓ |    |
| 3.                                            | Room arrangement/layout                                                                              |               |    |    | ✓ |    |
| 4.                                            | Appropriate font type and size                                                                       |               |    |    | ✓ |    |
| 5.                                            | Suitability of material with Merdeka Curriculum                                                      |               |    |    | ✓ |    |
| 6.                                            | Alignment between Learning Objectives and Learning Outcomes                                          |               |    |    | ✓ |    |
| 7.                                            | Congruence between Learning Outcomes                                                                 |               |    |    | ✓ |    |
| 8.                                            | Suitability of material with Learning Objectives                                                     |               |    |    | ✓ |    |
| 9.                                            | Suitability with learning steps.                                                                     |               |    |    |   | ✓  |
| 10.                                           | Learning strategies, methods, and facilities are selected appropriately to enable students to learn. |               |    |    |   | ✓  |
| 11.                                           | Teacher and student activities are formulated operationally and are easy to understand.              |               |    |    |   | ✓  |
| 12.                                           | Compliance with the Understanding by Design approach                                                 |               |    |    |   | ✓  |
| 13.                                           | Appropriateness of teacher and student activities                                                    |               |    |    |   | ✓  |
| 14.                                           | Grammatical correctness                                                                              |               |    |    |   | ✓  |
| 15.                                           | Simplicity of sentence structure                                                                     |               |    |    |   | ✓  |
| 16.                                           | Clarity of guidance and direction                                                                    |               |    |    |   | ✓  |
| 17.                                           | Language is easy to understand                                                                       |               |    |    |   | ✓  |
| Total Skor: 77                                |                                                                                                      |               |    |    |   |    |
| Grand Total: 85                               |                                                                                                      |               |    |    |   |    |
| Percentage: $\frac{77}{85} \times 100 = 91\%$ |                                                                                                      |               |    |    |   |    |
| Category: Very Good                           |                                                                                                      |               |    |    |   |    |

Table 2 shows that the validation carried out by the material expert obtains a percentage assessment of 91% in the Excellent category. The assessment given by the material expert states that the lesson plan is excellent and can be used. It can be seen from the clarity of the division of material, the numbering system, the type and size of the letters, that the suitability of the material

with the independent curriculum, the suitability of the material with the learning objectives, the correctness of the grammar, and the language is easy to understand has been declared Excellent.

Table 3. Results of practitioner validation

| No                                            | Aspect                                                                                               | Rating Scale |    |    |   |    |
|-----------------------------------------------|------------------------------------------------------------------------------------------------------|--------------|----|----|---|----|
|                                               |                                                                                                      | TB           | KB | CB | B | SB |
|                                               |                                                                                                      | 1            | 2  | 3  | 4 | 5  |
| 1.                                            | Clarity of material distribution                                                                     |              |    |    |   | ✓  |
| 2.                                            | Numbering system                                                                                     |              |    |    |   | ✓  |
| 3.                                            | Room arrangement/layout                                                                              |              |    |    | ✓ |    |
| 4.                                            | The module is organised with an attractive and easy-to-read display.                                 |              |    |    |   | ✓  |
| 5.                                            | Suitability of material with Merdeka Curriculum                                                      |              |    |    |   | ✓  |
| 6.                                            | Alignment between Learning Objectives and Learning Outcomes                                          |              |    |    |   | ✓  |
| 7.                                            | The material and activities are adjusted to the characteristics and abilities of grade V students.   |              |    |    | ✓ |    |
| 8.                                            | Suitability of material with Learning Objectives                                                     |              |    |    |   | ✓  |
| 9.                                            | Teacher and student instructions are clear, and learning steps are easy to apply and understand      |              |    |    |   | ✓  |
| 10.                                           | Learning strategies, methods, and facilities are selected appropriately to enable students to learn. |              |    |    |   | ✓  |
| 11.                                           | Teacher and student activities are formulated operationally and are easy to understand.              |              |    |    | ✓ |    |
| 12.                                           | The Understanding by Design approach is done well.                                                   |              |    |    |   | ✓  |
| 13.                                           | Appropriateness of teacher and student activities                                                    |              |    |    | ✓ |    |
| 14.                                           | Grammatical correctness                                                                              |              |    |    | ✓ |    |
| 15.                                           | Simplicity of sentence structure                                                                     |              |    |    | ✓ |    |
| 16.                                           | Clarity of guidance and direction                                                                    |              |    |    |   | ✓  |
| 17.                                           | Language is easy to understand                                                                       |              |    |    |   | ✓  |
| Total Skor: 79                                |                                                                                                      |              |    |    |   |    |
| Grand Total: 85                               |                                                                                                      |              |    |    |   |    |
| Percentage: $\frac{79}{85} \times 100 = 93\%$ |                                                                                                      |              |    |    |   |    |
| Category: Very Good                           |                                                                                                      |              |    |    |   |    |

The practitioner validation result, detailed in Table 3, indicates that the design of IPAS lesson plans with the Understanding by Design approach for grade V obtained a percentage of 93% in the Very Good category. The assessment given by the practitioner states that the learning plan is excellent and can be used, it can be seen from the module arranged with an attractive appearance and easy to read, the suitability between learning objectives and learning outcomes, materials and activities is adapted to the characteristics and abilities of grade V students, and the Understanding by Design approach is carried out well.

Table 4. Result of teacher response questionnaire

| No | Question                                                                                                                              | Answer                                                                                   |
|----|---------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| 1. | In your opinion, has my lesson plan implemented the Understanding by Design principle?                                                | Yes, the Understanding by Design principle has been applied to lesson planning.          |
| 2. | Do you think lesson planning with the UbD approach is effective in learning?                                                          | Yes, it has been effective in learning activities.                                       |
| 3. | How do you respond to the use of quizzes before learning?                                                                             | Good, very innovative, and can be continued                                              |
| 4. | How do you respond to using interactive learning media with the Understanding by Design approach in teaching and learning activities? | Very helpful, so that students have an overview of the material that has been delivered. |
| 5. | Are the learning activities using the UbD approach appropriate for the characteristics of the students in the class?                  | Yes, it is in accordance with the characteristics of students in the class.              |
| 6. | Does the UbD learning design help you in the learning process?                                                                        | Yes, very helpful.                                                                       |

Based on the data in Table 4, which described teachers' responses to the IPAS lesson plan design using the Understanding by Design (UbD) approach, it can be concluded that the lesson plan generally receives an average feasibility score of 93% and has received positive responses from teachers regarding the learning modules, student worksheets, teaching materials, and learning media, which are considered very innovative and very helpful in classroom learning activities. The concept mind map method is considered good and can be used by teachers in the future.

Table 5. Results of student response questionnaire

| No | Question                                                        | Answer Options      | Number of Options | Percentage |
|----|-----------------------------------------------------------------|---------------------|-------------------|------------|
| 1. | Do you like learning IPAS?                                      | (..) Yes<br>(..) No | 11<br>4           | 73%<br>23% |
| 2. | Do you like the learning that has been done?                    | (..) Yes<br>(..) No | 15<br>0           | 100%<br>0% |
| 3. | Does the media used help you learn?                             | (..) Yes<br>(..) No | 14<br>1           | 93%<br>7%  |
| 4. | Are you more excited about learning with the quizzes and games? | (..) Yes<br>(..) No | 14<br>1           | 93%<br>7%  |
| 5. | Do you think this learning should be done in the next lesson?   | (..) Yes<br>(..) No | 11<br>4           | 73%<br>27% |

It can be concluded that IPAS learning planning with the Understanding by Design approach is very feasible, with a percentage of 87%. From the questions listed, around 73% of students prefer IPAS learning. Meanwhile, when asked if they prefer the learning that has been carried out, all students answer yes. On whether the media used helps you learn, 14 students answer yes, and one answer no. On whether you are more enthusiastic about learning with the quizzes and games, 14 students answer yes, and one answer no. Regarding whether you are more

enthusiastic about learning with the quizzes and games, 14 students say yes, and one say no. On the question, do you think learning like this needs to be done in the next lesson, 11 students answer yes, and 4 answer no. There are no suggestions or comments regarding the product being tested. It can be concluded that a lesson plan greatly helps students in their learning.

#### 4. Discussion

This research produces an IPAS lesson plan design with the Understanding by Design approach in grade V elementary school. This lesson plan design is equipped with student activities to create mind mapping related to economic activities around me, and as a solution to create new situations for students. This is in line with Rusman, (2017), learning is planned so that all students have learning experiences that involve mental and physical processes through interactions between students, students with teachers, students with the environment, and other sources.

The design of the IPAS lesson plan with the Understanding by Design approach in grade V elementary school was developed to provide input and alternative IPAS lesson planning using the Understanding by Design approach to teachers, and to provide a new learning activity situation for students by making mind mapping one of the strategies to build the ability to work together, reason critically, and creatively. As well as strengthening students' conceptual understanding of economic activity around me, this research can serve as a teacher practitioner guide and as an innovative effort to improve the student learning process through student-centred activities. This is in line with the theory developed by Wiggins & McTighe (2005), that the understanding by design approach is designed to assist teachers in structuring learning that is more focused on student understanding, in line with Pertiwi et al. (2019), this design can be used as an alternative learning design to improve the quality of education.

The validation results show that this learning design is feasible for use. The high level of validity indicates that the components in the design align with the established indicators. This is reinforced by the results of trials involving teachers and students, in which teachers assessed this design as highly relevant for application in learning. In contrast, students responded positively to the new learning experiences they gained. These responses show that this design is conceptually acceptable and effective in practice. Overall, the IPAS learning design based on Understanding by Design has proven to provide a meaningful learning experience, encourage active student engagement, and open opportunities for teachers to develop more creative learning models. Therefore, this design can be a reference and an innovative alternative in designing learning oriented towards student needs.

The research limitations lie in the small sample size, and the trials were conducted only twice in one class. These conditions mean the study's findings are contextual and cannot be generalised to the wider population of elementary school students with different characteristics. The trials were conducted twice due to very limited facilities and infrastructure, and differences in student backgrounds and teaching styles that affected the implementation of the developed learning design. The study results show positive effectiveness, but its application requires further testing with a larger, more diverse sample size and in different learning contexts to strengthen its external validity.

Mind maps in instructional design align with the backward design principle in Understanding by Design (UbD). In the identifying desired results stage, teachers determine essential understandings related to economic activities around students. At the same time, mind maps serve as a medium for mapping key ideas and their interrelationships so that understanding can be formed more systematically. In the determining acceptable evidence stage, mind maps

become a form of authentic evidence of student understanding. By preparing mind maps, students reproduce facts and demonstrate their ability to connect concepts, organise information, and interpret the relationships between ideas. In the planning, learning experiences, and instruction stage, mind maps are learning activities that encourage active engagement, critical thinking skills, and student cooperation. Therefore, mind maps are not only positioned as a note-taking technique, but as a pedagogical instrument integrated with the three main stages of UbD. These findings reinforce that learning designs based on final objectives can be realised in classroom practice, while supporting the creation of meaningful learning experiences.

The test was carried out to test the feasibility of the product, which involved teachers and fifth-grade students of Karangsono 02 State Elementary School. The test results administered to the fifth-grade teacher at Karangsono 02 State Elementary School yielded a percentage score of 93%, indicating an excellent category, which aligns with the research conducted by Utami (2024). The results of the recapitulation of the teacher's response to the teaching module were 90.3%, a suitable category for use. This feasibility assessment is based on the attractiveness, content, learning outcomes, and learning objectives of the learning planning design developed. Meanwhile, a trial involving 15 students showed that 87% answered "Yes," indicating that most students felt the learning design was useful regarding material clarity, the media used, quizzes and games, and the overall meaning of the learning experience. This percentage is acceptable because it aligns with research conducted by Windya Wati (2022), which states that around 84.35% of students agree with using the Understanding by Design approach to produce positive results. Therefore, it can be concluded that learning plan designs developed with an Excellent rating can help students experience new situations in learning activities.

## 5. Conclusion and Implications

### 5.1 Conclusion

This study successfully developed an IPAS lesson plan design using the Understanding by Design approach in a fifth-grade elementary school, based on the validation results by subject matter experts, learning plan experts, and practitioners. The design received ratings ranging from Good to Excellent, with 81%, 91%, and 93%, respectively. The feasibility assessment by teachers obtained a score of 93%, while student responses reached an acceptance level of 87%. These findings confirm that the developed learning planning design is valid and feasible to be applied in the context of IPAS learning at Karangsono 02 Public Elementary School.

### 5.2 Implications

This design serves as a teacher guide and provides students with a more contextual and meaningful learning experience through mind mapping and interactive media. Hopefully, this research can provide alternatives for teachers when creating lesson plans, allowing them to adapt UbD-based plans by considering the local curriculum context, student characteristics, and learning resources and environments.

#### Credit authorship contribution statement

**First Author:** Understanding by Design, **Second Author:** Lesson Plan, **Last Author:** Methodology

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