

# Effectiveness of Problem-Based Learning Textbooks: ICARE's Pedagogical Approach to the Teaching Profession

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## ABSTRACT

The objectives of the study are to design a problem-based learning-based teaching profession textbook using the ICARE (Introduction, Connection, Application, Reflection, Extension) pedagogical approach; to assess the viability and efficacy of a PBL-based teaching profession textbook. Using the Borg and Gall paradigm, this research methodology called research and development (R&D). The study was carried out at the FIP Unimed, PGSD Department, Teaching Profession course. Students and instructors with expert validation—that is, specialists in learning design, visual design, and materials—were the study's subjects. Additionally, by carrying out field, small-group, and individual trials. Expert validation from subject matter experts, learning design experts, and graphic design experts is required for the entire product's results. In order to identify a teaching profession textbook based on PBL and assess its viability and efficacy, the following step involves conducting individual, small group, and field trials as well as carrying out revisions and analysis. ANOVA and/or the t-test will be used to examine the quasi-experimental approach (pretest-posttest with control group design) and the study's findings. The study's findings show that the PBL-Based Teaching Profession Textbook is deemed useful and appropriate for use in the classroom, with the potential to enhance student learning outcomes.

## KEYWORDS

textbook; education profession; problem-based learning; pedagogic ICARE.

## INTRODUCTION

At the practical level, the challenges related to the implementation of our education are related to daily learning activities. These learning activities focus too much on the interests of policy and the interests of teachers rather than the interests of children, but face the past rather than the future, so that priority is given to continuing children's learning. For children who will enter social life, the benefits of learning rather than education prioritize the content of knowledge rather than the abilities that children can use to achieve life (Djohar, 2006).

So far, studying at universities and colleges still has the essence of conveying information from lecturers to students. Learning must be centered on the process of education rather than just the use of problem-based learning to transmit knowledge. It is essential to support the growth of learning accomplishments (like collaboration), respecting opinions, knowing yourself and others, etc.). Studying at colleges and universities requires not only technical skills but also achievements (abilities and mentality, mental attitude, personality, wisdom, and broad knowledge).

Particularly for university students, the professional education course is a vital requirement. Students will get an understanding of the fundamentals of professional ethics, the teaching profession, the teaching profession association, the teaching profession code of ethics, and teacher professional development through this course. The aim of this course is to help students become more knowledgeable, perceptive, and aware of the concept of professional ethics through a variety of educational career-related topics.

The learning paradigm that is being employed is adequate given the needs of the pupils in terms of both thinking skill development and learning. The ICARE approach is intended to facilitate effective online learning for students. ICARE's guiding idea is to supply the resources required for every subject. You may quickly use what pupils have learnt in the real world by using the ICARE approach. The introduction, connection, application, reflection, and extension are the five components of the ICARE approach. Student character can be developed with this approach (Nisya' and Muchlis, 2013). A meaningful learning experience can be had by improving learning through application and practice (Wahyudin et al., 2010). As a result, learning for students should include applying the material they acquire to real-world situations in addition to simply acquiring it.

Prospective educators and learners can use this lecture as a resource to help them prepare for a career in education. The way the content is delivered is determined by the ICARE learning model's grammar and particular student instances. With these concrete examples, it is intended that students will be able to experience firsthand how this learning paradigm sparks their attention and enhances their assignments and learning results. This methodology can also be used by students who wish to become teachers after gaining experience in the classroom.

According to Nurdin (2010), a profession is a line of employment that is founded on a certain set of skills and training. defining a profession as "a profession that delivers esoteric service based on esoteric knowledge systematically formulated and applied to the needs of a client" (i.e., a profession that works with clients to meet their needs by formulating and applying knowledge that is systematically understood by certain people).

Educators, as referred to in Law Number 1 of the Republic of Indonesia dated 14 of 2005, consist of teachers and lecturers. In this study, we will specifically discuss problems related to teachers. According to the description of Law Number, Article 1 paragraph (1) 14 of 2005, "Teachers are professional educators whose main task is to educate, teach, and guide students in early childhood education through formal education, basic education, and secondary education. Guidance, training, evaluation, and evaluation.". Article 10 paragraph 1 reads: " Teaching talents, personality abilities, social abilities, and professional abilities acquired via professional education are all included in the teacher abilities mentioned in Article 8." The abilities of educators regulated in the 2003 National Education System Law are the abilities of educators in managing student learning, including: (1) ability to understand students; (2) The five abilities are: (1) designing learning; (2) implementing learning; (3) evaluating learning outcomes; and (5) helping students reach their full potential. A teacher must possess pedagogical competence in order to effectively manage students' learning, which includes understanding learning theories and student characteristics.

Educator/teacher is a profession, which means that the position requires special professional knowledge as an educator and cannot be held by anyone outside the field of education. In fact, this problem still exists in the field of education. Asmani (2009) believes that, in a simple sense, a teacher is someone who prioritizes the transfer of knowledge from learning sources to their students. Society views teachers as people who educate.

Nurdin (2010) asserts that teachers are professionals in education because they willingly and covertly take on a portion of their parents' educational obligations. According to Kartikawati and Lusikooy (1993), teacher professionalization entails official credentials and teaching permits as well as the inculcation of actual credentials that are only obtained via experience. Nurdin (2010) defined a teacher as a somebody who aspires to teach. It is the primary duty of educators to instruct students.

The course on the educational profession is quite important, particularly for college students. Students will get an understanding of the fundamentals of professional ethics, the teaching profession, the teaching profession association, the teaching profession code of ethics, and teacher professional development through this course. The aim of this course is to enable students to have a deeper comprehension and awareness of the notion of professional ethics by exploring diverse facets associated with the field of education.

San Diego State University's Bob Hoffman and Donn Ritchie originally presented the ICARE learning approach in 1997. The ICARE learning model was first created by San Diego State University for use in online instruction, but it eventually evolved and became useful in classroom settings as well. Indonesia started implementing and utilizing the ICARE pedagogical framework in teacher preparation programs and classroom instruction in 2006 as part of the Decentralization of Basic Education (DBE) initiative.

As a teaching profession textbook based on PBL, the ICARE pedagogical approach certainly has stages starting from the planning stage, implementation, and final evaluation. The stages of the ICARE learning model begin with the preparation of topics, analysis of class needs, and development of contexts.

PBL is an approach to education where students solve problems using steps of the scientific method in order to gain knowledge about the subject and develop their problem-solving abilities (Ralph et al., 2005). Problem-based learning is a learning paradigm that uses a real-world problem background to help students develop critical thinking and problem-solving abilities as well as essential knowledge and concepts, according to study by Indrawati and Wawan (2009). The goal of problem-based learning is to promote higher order thinking, which includes learning how to learn. Inquiry and dialogue are encouraged, and the teacher's job in problem-based learning is to ask plenty of questions.

PBL, according to Arends (2008: 41), is teaching through the presentation of authentic, significant issue scenarios to students, which can serve as a springboard for further research and inquiry. In the meantime, PBL, according to Sanjaya (2009: 214), can be seen as a sequence of educational exercises that highlight the problem-solving techniques used in science.

Trianto (2007: 67) shows that problem-based learning provides students with real and meaningful problem situations, which makes it easier for them to conduct investigations and investigations. Through the questions given, students will try to solve the problem based on previous knowledge so that students can find the relationship between previously learned material and new material.

According to Amir (2008: 12), the characteristics of PBL include: (1) learning begins by asking questions; (2) groups of students actively ask questions; (3) research and find their own material related to the problem and report solutions. Sugiyanto (2008: 140) stated that there are 5 stages that must be implemented in PBL, namely: (1) Providing direction to students regarding the issue. (2) Setting up the students' research projects. (3) supporting both group and independent investigations. (4) Create and present the outcomes. 5. Examine and assess the process of solving problems. The problem formulation used in this investigation consists of: (1) How to develop a teaching profession textbook based on PBL with the ICARE pedagogical approach; (2) Is the teaching

profession textbook based on PBL with the ICARE pedagogical approach suitable for use; (3) Is the teaching profession textbook based on PBL with the ICARE pedagogical approach effective in improving student learning outcomes.

## RESEARCH METHODS

The research methodology employed in this study is the R&D (Research and Development) paradigm. According to Borg and Gall (1983), in their book "Educational Research," research and development (R&D) in education is an industry-based development model in which learning products are designed using research findings, which are then methodically tested in the field, assessed, and improved until a learning product is created that satisfies standards for effectiveness, efficiency, and quality.

The PGSD Department, FIP Unimed Academic Year 2021/2022, carried out this study during the sixth semester of the Education Profession course. by creating PBL instructional resources for the course on education professions.

The following expert groups are the focus of the research on the creation of PBL-based educational profession textbooks utilizing the ICARE pedagogical approach: experts in instructional design, graphic design, learning media, and learning materials. Development study using students and instructors as participants in validation group and individual trials, small group trials, and field studies. In this instance, the aim is established during the learning model development stage by lecturers, subject matter experts, learning experts, and students who assess the learning model according to the following standards: (1) Expert judgment (2) Evaluators who conduct evaluations Determined according to the lecturer's ability and expert classification in the field of evaluating research results.

The procedure and design that will be used in this study is by implementing the ASSURE development model. In the development procedure, it can be done with research on the development of educational profession textbooks based on PBL with the ICARE pedagogical approach as the initial step in making the product, which contains Adjustment Journal material.

This trial stage is carried out in order to collect data in order to conduct a formative assessment, which serves as the foundation for deciding if the product is engaging or appropriate for use. The following is the order in which the activities were completed: (1) Certification of specialists in accounting education materials; (2) Certification of experts in media, learning design, and multimedia; (3) individual trials; and (4) student group trials.

After the interactive accounting multimedia product produced was After being verified by specialists in media, materials, and design, the product was put to the test on three students who were split up into three testing phases: (1) individual trials carried out by three individuals with low, medium, and high levels of understanding who were taught. (2) Small group trials conducted by 15 students randomly. The questionnaires needed are as follows: (1) assessment questionnaire from learning design experts; (2) assessment questionnaire from media experts; (3) assessment questionnaire from material experts; (4) trial questionnaire on students.

**Table 1.** Expert Validation Assessment Instrument Grid

| Aspect                | Indicator  |
|-----------------------|--|
| Guide and Information | Description of textbook product; Guide to using textbook; Implementation guide; Formulation of objectives; Formulation of competencies / objectives / learning achievements of the course (CPMK) |
| Multimedia Material   | Suitability of objectives with curriculum demands; Suitability of material with objectives (CPMK); Suitability of material with user characteristics; Up-to                                      |

| Aspect     | Indicator   |
|------------|---|
|            | dateness of material; Description of concepts or theories; Sequence (syntax) of material presentation; Suitability of material coverage with objectives (CPMK); Suitability of material depth with objectives (CPMK); Providing examples or illustrations to support the material; Providing a summary; Suitability of time duration with the presented material; Use of spelling and grammar in presenting the material  |
| Evaluation | Exercise/exam instructions; Suitability of question coverage with objectives or CPMK; Suitability of cognitive level of question items with objectives or CPMK; Suitability of question difficulty level with objectives or CPMK; Distribution of questions for each level based on objectives or CPMK; Suitability of exam questions with the time duration provided; Variation of question materials and their suitability with objectives or CPMK; Feedback (review) of exercise or exam results |

**Table 2.** Expert Validation Assessment Instrument Grid for Learning Design

| Aspect              | Indicator  |
|---------------------|--|
| Learning Design     | Accuracy of Topic Selection; Suitability of material with learning indicators; Provision of practice; Consistency of tests with learning indicators  |
| Information Design  | Provision of motivation; Use of Learning Instructions; Clarity of material description; Clarity of examples given; Feedback on student learning test results; Explanation of terms; Maximizing the learning process; Ease of use |
| Presentation Design | Color composition; Use of graphics and layout/layout; Selection of font type and size; Use of learning menu; Image and animation quality;  |

**Table 3.** Expert Validation Assessment Instrument Grid for Media

| Aspect   | Indicator  |
|--|--|
| Guide and Information                                | Description of the textbook product; Guide to the use of textbooks by lecturers; Assistance facilities   |
| Operation of Textbook Devices                        | Ease of installation and or configuration settings; Accuracy of textbook use; Ease of use of textbooks; Accuracy of search and material links; Image quality; Consistency of textbook operations; Reliability of textbook operations; Support for required operating systems; Interactivity of responsive user stimuli with the system   |
| Systematics, Aesthetics, and Principles of Textbooks | <p><b>Media Systematics:</b> Systematics of textbook display; Textbook facilities; letter, number, and symbol acceleration</p> <p><b>Media Aesthetics:</b> Visual quality (resolution) of graphics or images; Color composition and display resolution on the screen; Suitability of text color with background; Acceleration of text, visuals, and animation</p> <p><b>Quality of narrative:</b> Clarity of textbooks; Language in stories is easy to understand; stories are communicative according to user needs; Suitability with presentation material; Quality of textbook animation; Use of animation resolution; Suitability of objects to the presentation material; Visualization of objects on abstract concepts and properties of the material; Ability to reduce misperceptions of objects; Learning principles in textbooks; Application of spatial principles; Use of temporal principles; Application of learning principles;</p> |

**Table 4.** Expert Validation Assessment Instrument Grid for Material

| Aspect              | Indicator  |
|---------------------|--|
| Content Feasibility | Suitability of the material provided; Learning instructions provided; Sentences in the text are easy to understand; Sequence of presentation of material; Practice questions and assignments provided; There is feedback from learning outcomes; Suitability of practice questions to material content   |
| Presentation        | Textbook appearance; Text used is easy to read; Image and animation quality; Color composition; Interaction in learning  |
| Benefits            | I can understand the material of the educational profession textbook based on PBL with the ICARE pedagogical approach; I find it easier to learn using the educational profession textbook based on PBL with the ICARE pedagogical approach; I am interested in learning with the educational profession textbook based on PBL with the ICARE pedagogical approach |

**Table 5.** Student Field Trial Instrument Grid

| Aspect              | Indicator   |
|---------------------|---|
| Content Feasibility | Clarity of learning objectives; Accuracy of material; Truth of concept; Depth of learning material; Suitability with curriculum; Accuracy of the arrangement of learning material; Suitability of questions to the material |
| Presentation Aspect | Quality of presentation; Student involvement in learning; Quality of feedback; Time of presentation; Quality of practice questions  |
| Language            | Logical presentation; Use of language; Ease of language understanding   |

### **Product Feasibility Test Data Analysis Technique**

Data analysis in this development research uses quantitative descriptive analysis, where all data that has been obtained from the questionnaire sheet is examined using descriptive statistical techniques that are quantitatively grouped by category to sharpen the assessment in drawing conclusions. Quantitative data with a value scale of 1 to 5 is created from qualitative data in the form of assertions that are extremely lacking, lacking, sufficient, good, and very feasible.

The following formula and criteria will be used to translate the product development criteria into values using a Likert scale:

**Table 6.** Product Assessment Criteria

| Value | Criteria           | Percentage (%) |
|-------|--------------------|----------------|
| A     | Very Feasible      | 81 – 100       |
| B     | Feasible           | 61 – 80        |
| C     | Quite Feasible     | 41 – 60        |
| D     | Less Feasible      | 21 – 40        |
| E     | Very Less Feasible | 0 – 20         |

*Source: Sugiyono (2011: 134-136)*

The testing criteria are:

Ho :  $\mu < 61\%$  then the product is not feasible

H1 :  $\mu > 61\%$  then the product is feasible

### **Feasibility Test Data Analysis Technique**

The input obtained from the results of the multimedia assessment by experts is then analyzed using the following formula (Sriadhi, 2018):

Make a tabulation of the response ratings for every instrument question in every category. Use the following formula to find the average score for each aspect's answers:

$$\bar{x} = \frac{\sum X}{n}$$

Description:

$\bar{x}$  : Average score

$\sum X$  : Total score of statement items

$n$  : Total data (number of statement items)

By including all item scores in the three assessment components and computing the average value using the following formula, the overall viability of the medium is evaluated:

$$\bar{x}_t = \frac{\sum X_i}{N}$$

Description:

$\bar{x}_t$  : Average score

$\sum X_i$  : Total score of the three assessment aspects

$N$  : Total data of the three assessment aspects

The results of this calculation are interpreted as shown in Table 7 below to ascertain the feasibility:

**Table 7.** Interpretation of Product Quality Assessment

| No | Interval Mean Score | Interpretation |
|----|---------------------|----------------|
| 1. | 1.00 – 2.49         | Not Feasible   |
| 2. | 2.50 – 3.32         | Less Feasible  |
| 3. | 3.33 – 4.16         | Feasible       |
| 4. | 4.17 – 5.00         | Very Feasible  |

*(Adapted from Sriadhi, 2019)*

### **Effectiveness Test Data Analysis Techniques**

Techniques for both descriptive and inferential data analysis are employed. When analyzing data, descriptive approaches are statistics that describe the data that has been gathered without trying to make any kind of generalization or conclusion. Tables, graphs, pie charts, pictograms, and computations of mode, median, mean, decile, percentile, average, standard deviation, percentage, correlation, and regression without significance testing are examples of descriptive data display strategies. Conversely, inferential procedures are statistical methods for examining sample data and extrapolating findings to the entire population, the conclusions drawn have the potential for error and truth. The steps of data analysis techniques are as follows:

#### **Average value**

The following formula is used to obtain the average value of Sugiyono (2011):

$$\bar{x} = \frac{\sum X_i}{n}$$

Description:

$\bar{x}$  : Mean (Average)

$\sum X_i$  : sum of x values from I to n  
 $n$  : Number of individuals

### Standard deviation (Standard Deviation)

$$s = \sqrt{\frac{\sum(X_i - \bar{X})^2}{(n - 1)}}$$

Description:

$s$  : sample standard deviation  
 $X_i$  : x values from 1 to n  
 $\bar{x}$  : average  
 $(n - 1)$  : degrees of freedom  
 $n$  : Number of samples

The normality test is undertaken to assess whether the study data is normally distributed or not. This indicates whether or not the population's data distribution is normal. The Chi Square formula is used in this data normalcy test as follows:

$$x^2 = \sum \left( \frac{(F_o - F_h)^2}{F_h} \right)$$

Description:

$x^2$  = Chi Square  
 $F_o$  = Frequency obtained from the sample  
 $F_h$  = Expected frequency from the sample

As stated by Arikunto (2014), degrees of freedom for the number of frequency classes - 1 ( $dk = K-1$ ) and a significance threshold of 5% were applied to the Chi Square Price. It is possible to determine that the data is regularly distributed if  $\leq$ . The purpose of the homogeneity test is to ascertain whether the population's data distribution is homogeneous. According to Sudjana (2005: 249), the homogeneity test of variance can be calculated using the Barlett test, namely:

$$F = \frac{s_1^2}{s_2^2}$$

Description:

$s_1^2$  = variance of group one sample  
 $s_2^2$  = variance of group two sample

Testing criteria:

If  $F_{count} < F_{table}$ , then the sample has the same variance.

If  $F_{count} > F_{table}$ , then the sample does not have the same variance.

### Hypothesis Testing

The validity of the research hypothesis must be ascertained; in this study, the t-test (an independent test) is the statistical method employed to do this. The post-test results in the sample group are the prerequisites that need to be satisfied for the t-test data analysis. The following is the hypothesis for the effectiveness test that has to be verified:

$H_o$  :  $\mu_1 = \mu_2$   
 $H_a$  :  $\mu_1 \neq \mu_2$

Description:

$\mu_1$ : average learning outcomes of students who study using the PBL-based educational profession textbook with the ICARE pedagogical approach

$\mu_2$ : average learning outcomes of students who study conventionally.

$H_a$ : Learning outcomes in different classrooms varied significantly from one another that learn using interactive multimedia-based learning models and conventional ones

$H_0$ : There is no significant difference in learning outcomes between classes that learn using PBL-based educational profession textbooks with the ICARE pedagogical approach and conventional ones

For hypothesis testing, a two-tailed test formula is used:

$$t_{count} = \frac{\bar{x}_1 - \bar{x}_2}{S \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

where S is the formula-calculated root of the total variance:

$$S^2 = \frac{(n_1-1)S_1^2 + (n_2-1)S_2^2}{n_1 + n_2 - 2} \quad \text{where } S = \sqrt{S^2}$$

Description:

$\bar{x}_1$  : average score of the experimental class

$\bar{x}_2$  : average score of the control class

$n_1$  : number of samples of the experimental class

$n_2$  : number of samples of the control class

$S_1^2$  : variance in the experimental class

$S_2^2$  : variance in the control class

S : combined variance

t : calculation price

If  $t_{count} > t_{table}$ , which was derived from the t distribution list with degrees of freedom  $dk = n_1 + n_2 - 2$ , and a significance threshold of 5%, is met, the  $H_1$  test requirements are accepted.

The effectiveness value of the educational profession textbook based on the ICARE pedagogical approach PBL is obtained based on the percentage of classical completeness, which is then categorized based on the minimum learning completeness standard of 75 in the accounting subject where the effectiveness criteria are met if students who achieve completeness are greater than or equal to 75.

## RESULTS AND DISCUSSION

At the development stage, the collection and creation of the educational profession textbook based on the ICARE pedagogical approach PBL that has been developed in this study are described as follows:

**Table 8.** Results of Overall Validation of Material

| No             | Assessment Aspects    | Mean        | Percentage   | Criteria             |
|----------------|-----------------------|-------------|--------------|----------------------|
| 1              | Guide and Information | 4.00        | 100          | Very Feasible        |
| 2              | Textbook material     | 3.52        | 88.00        | Very Feasible        |
| 3              | Evaluation            | 3.62        | 90.50        | Very Feasible        |
| <b>Average</b> |                       | <b>3.79</b> | <b>94.63</b> | <b>Very Feasible</b> |

**Table 9.** Results of Overall Validation of Learning

| No             | Assessment Aspects        | Mean        | Percentage   | Criteria      |
|----------------|---------------------------|-------------|--------------|---------------|
| 1              | Learning Objectives       | 4.00        | 100          | Very Feasible |
| 2              | Information Design        | 3.37        | 84.25        | Very Feasible |
| 3              | Learning Model Structure  | 3.53        | 88.25        | Very Feasible |
| 4              | Desired Learning Outcomes | 4.00        | 100          | Very Feasible |
| <b>Average</b> |                           | <b>3.73</b> | <b>93.13</b> | Very Feasible |

**Table 10.** Overall Validation Results of Learning Media

| No             | Assessment Aspects                                 | Mean        | Percentage   | Criteria      |
|----------------|--|-------------|--------------|---------------|
| 1              | Guide and Information                              | 4.00        | 100          | Very Feasible |
| 2              | Operation of Textbook Devices                      | 3.33        | 83.25        | Very Feasible |
| 3              | Systematic Aesthetics, and Principles of Textbooks | 3.52        | 88           | Very Feasible |
| 4              | Textbook Quality                                   | 3.21        | 80.25        | Very Feasible |
| 5              | Principles of Textbook Design                      | 3.85        | 96.25        | Very Feasible |
| <b>Average</b> |  | <b>3.58</b> | <b>89.55</b> | Very Feasible |

Individual trials to students totaling 3 students based on 3 assessment aspects as seen in Table 11 below:

**Table 11.** Student Assessment Results Trial Individual

| No             | Assessment Aspects | Mean        | Percentage   | Criteria      |
|----------------|--------------------|-------------|--------------|---------------|
| 1              | Content Feasibilit | 3.91        | 97.75        | Very Feasible |
| 2              | Presentation       | 3.86        | 96.5         | Very Feasible |
| 3              | Usefulness         | 3.77        | 94.25        | Very Feasible |
| <b>Average</b> |                    | <b>3.85</b> | <b>96.17</b> | Very Feasible |

Small group trials on 15 students based on 3 assessment aspects as seen in Table 12 below:

**Table 12.** Student Assessment Results in Small Group Trials

| No             | Assessment Aspects  | Mean        | Percentage   | Criteria      |
|----------------|---------------------|-------------|--------------|---------------|
| 1              | Content Feasibility | 3.88        | 97           | Very Feasible |
| 2              | Presentation        | 3.91        | 97.75        | Very Feasible |
| 3              | Usefulness          | 3.85        | 96.25        | Very Feasible |
| <b>Average</b> |                     | <b>4.13</b> | <b>97.00</b> | Very Feasible |

Summary results of the assessment results of the feasibility test on professional textbooks educational PBL-based ICARE pedagogical approach to educational profession learning by material experts, design experts, media experts, individual trials, and small group trials can be seen in Table 13 below:

**Table 13.** Summary of Average Results of Feasibility Test Assessment

| No             | Respondent             | Assessment Results (%) | Criteria      |
|----------------|------------------------|------------------------|---------------|
| 1              | Material Expert        | 94.63                  | Very Feasible |
| 2              | Learning Design Expert | 93.13                  | Very Feasible |
| 3              | Learning Media Expert  | 89.55                  | Very Feasible |
| 4              | Individual trial       | 96.17                  | Very Feasible |
| 5              | Small group trial      | 97.00                  | Very Feasible |
| <b>Average</b> |                        | <b>94.10</b>           | Very Feasible |

Table 14 below is a summary of the data normality test:

**Table 14. Summary of Normality Test**

| Class  | Lcount | Ltable | Conclusion |
|--|--------|--------|------------|
| Average student learning outcomes when adopting the educational profession textbook's PBL-based ICARE pedagogical method | 0,071  | 0,180  | Normal     |
| Average learning objectives imparted under the traditional learning paradigm   | 0,148  | 0,180  | Normal     |

The aforementioned table demonstrates the normal distribution of average data on student learning results taught utilizing the ICARE pedagogical technique in conjunction with the PBL-based educational profession textbook. This is determined by looking at the big L count < L table at a 5% significance level, which is 0.071 < L table at a 5% significance level, which is 0.180. And the same thing also applies to the average learning outcomes of students taught conventionally distributed normally. This is determined by looking at the huge L count < L table at a 5% significance level, which is 0.148 < L table at a 5% significance level, which is 0.180. Table 15 below shows the summary of the data homogeneity test:

**Table 15. Summary of Homogeneity Test**

| Class  | Fcount | Ftable | Conclusion |
|--|--------|--------|------------|
| Average student learning outcomes when adopting the educational profession textbook's PBL-based ICARE pedagogical method | 1,063  | 1,80   | Homogen    |
| Average learning objectives imparted under the traditional learning paradigm   |        |        |            |

Table 15 above shows that the student learning outcomes data are homogeneous when taught utilizing the PBL-based educational profession textbook with the ICARE pedagogical technique. This was determined by looking at the huge Fcount \Ftable at a significance level of 5%, where 1.80 was the Ftable value and 1.0633 was the Fcount value.

When students utilize educational profession textbooks built on the PBL pedagogical paradigm ICARE, their average learning results are higher than when they use traditional learning models. The formulation of the research hypothesis to be tested is:

$$H_0 : \mu_1 \leq \mu_2$$

$$H_a : \mu_1 > \mu_2$$

Description:

$\mu_1$  = average learning outcomes of students who study using educational profession textbooks based on PBL pedagogical approach ICARE

$\mu_2$  = average learning outcomes of students who study conventionally.

H<sub>0</sub>: The learning outcomes of classrooms that use the PBL-based educational profession textbook with the ICARE pedagogical approach and classes that are taught traditionally differ significantly.

H<sub>a</sub>: Between classrooms that use the PBL-based educational profession textbook with the ICARE pedagogical method, there is no discernible difference in the learning outcomes and classes that are taught conventionally

From the calculation results in the Appendix, tcount = 4.363 and the ttable value at the 5% significance level is 1.677, indicating that H<sub>0</sub> is rejected and H<sub>1</sub> is accepted since

tcount > ttable (4.36 > 1.677). In light of this, it can be said that using an ICARE pedagogical method in conjunction with a PBL-based educational profession textbook yields better learning outcomes than using a traditional learning model. In Table 16 below, the hypothesis test is summarized:

**Table 16. Summary of Hypothesis Test Calculation**

| Average Posttest Value   |                                   | tcount        | ttable | Conclusion                        |
|--|-----------------------------------|---------------|--------|-----------------------------------|
| Using PBL-based educational profession textbooks with ICARE pedagogical approach | Using Conventional Learning Model | 4.36          | 1.67   | There is a significant difference |
| <b>80,60%</b>  |                                   | <b>70.20%</b> |        |                                   |

The learning outcomes of students using the PBL-based educational profession textbook with the ICARE pedagogical approach are higher than those of students using the conventional learning model, according to empirical evidence derived from the results of the hypothesis testing. The following describes the efficacy of the ICARE pedagogical technique in conjunction with the PBL-based educational profession textbook for accounting learning:

$$\bar{x} = \frac{\text{score obtained}}{\text{total ideal score}} \times 100\%$$

$$\bar{x} = \frac{2015}{2500} \times 100\% = 80,6\%$$

While the effectiveness of learning using the conventional model

$$\bar{x} = \frac{\text{score obtained}}{\text{total ideal score}} \times 100\%$$

$$\bar{x} = \frac{1755}{2500} \times 100\% = 70,2\%$$

As a result, the PBL-based educational profession textbook that uses the ICARE pedagogical approach has a greater efficacy value than the traditional learning model.

### **Discussion**

Summary of the results of the feasibility test assessment of the PBL-based ICARE pedagogical approach textbook on educational profession learning by material experts, design experts, media experts, individual trials, and small group trials with an average of 94.10 Very Feasible criteria. So the product developed can be used in the learning process with the ICARE pedagogical approach PBL-based educational profession textbook.

The results of the study by Rachmanisa and Fauji (2024) showed the same thing in improving learning outcomes by showing that The book creator's medium for teaching Arabic maharah istima was found to be highly reliable and to be in perfect condition, making it an excellent choice for class X bilingual Madrasah Aliyah Terpadu Darul Fikri Sidoarjo students learning maharah istima. The media experts' validity was 81.81% with the criteria "very valid," while the material experts' validity findings showed a percentage of 82.5% with the same criteria.

Research by Nisa et al. (2024) shows that the validity of the product is confirmed through the assessment of media, material, and practitioner experts with percentage scores of 85.5%, 85%, and 92.3%, which indicates a very high level of validity. The practicality and effectiveness of the product are proven through trials on students. The average score of

89% of students in the limited trial. Meanwhile, a broader trial produced an average percentage of 86.7%. This indicates that the interactive learning material is very practical. The effectiveness of the product is seen based on the increase in the number of students who meet the value above the KKM with an initial percentage of 40% to 84%, making the teaching material meet the effective criteria.

Through one-to-one evaluation data on the research of Tri and Muslihah (2024), a student response of 95% was obtained; in the small group tryout evaluation, a student response of 92.44% was obtained; and in the field tryout evaluation, a student response of 87.08 was obtained. The average student response to the textbook was 88.58, indicating a very practical category. For the level of readability of the textbook, the average learning outcome test score was 81.07 in the very good category. Thus, it can be said that contextual-based Indonesian morphology teaching materials have a very high level of practicality and a very good level of readability. The same thing applies to the development of teaching profession textbooks.

According to the findings of Taqwa (2024), there was an increase in students' comprehension of concepts with an average score in the medium category; (2) this textbook has practical criteria; and (3) the content validity and reliability scores were included in the high category. The Derivative Calculus Textbook has improved STKIP Andi Matappa students' conceptual knowledge by meeting the requirements of validity, reliability, and practicality. High-quality textbook development will enhance student learning objectives.

After implementing the contextual teaching and learning model with the ICARE approach, students in the experimental class demonstrated higher levels of motivation and activity in their learning. As a means of encouraging students to be able to apply the material they are studying to real-life circumstances, CTL is a learning approach that places a strong emphasis on the process of complete student involvement (Sanjaya, 2008: 255). The ICARE model is an ICT learning strategy that prioritizes happy, creative, and active learning qualities (Wahyudin, 2010).

Research conducted by Faulina and Fitria (2017) on the influence of the CTL learning model with the ICARE approach on ICT lessons shows the same thing: the contextual teaching and learning learning model with the ICARE approach turns out to have a more significant effect on learning outcomes in information and communication technology compared to using conventional learning models.

The use of the ICARE learning model is consistent with the findings of a number of other researchers cited in this text, who have previously researched the development of the ICARE learning model in class expansion that is in line with the culture and character of students and found that using the ICARE model, student learning outcomes were higher; Kuntum and Siti (2018) investigated whether the ICARE approach can improve autistic children's General Life Skill abilities; Siti (2017) discovered a rise in creative thinking when using the ICARE-based problem solving learning model and the Scientific Approach; and Desi et al. (2017) investigated the development of ICARE-K character learning. The study's findings led to the conclusion that student learning outcomes were impacted by the ICARE learning paradigm. This is so that students are engaged in the learning process and the ICARE learning model may produce engaging learning for them. Students' learning outcomes rise as their education takes on greater significance for them.

Triani et al. (2018) conducted a study on I-CARE learning assisted by practicums, and their findings revealed the following implications of using this model: (1) it is a learning model that prioritizes contextual aspects based on students' daily experiences and strengthens problem-solving skills holistically, systematically, integrated, and

meaningfully, starting from the introduction of concepts and problems to implementation; (2) it must be implemented flexibly, adjusting to class/environmental conditions and student characteristics, even though syntactically it includes the stages of introduction, connect, apply, reflect, and extend; (3) the I-CARE model is flexible, universal, and open to continued development according to the characteristics of the material and subjects.

According to Wahyudin (2010) research findings, the ICT learning model, when combined with the ICARE model, has a good impact and has the potential to enhance learning experiences by making them more pleasurable and meaningful. This study demonstrates that the ICARE model affects content mastery through the use of a statistical test with a 95% significance level of 0.05 and a comparison of pre- and post-test results. Validation tests at the same level of significance demonstrate that the ICT learning model through ICARE is more effective than other models that instructors have used in urban, borderline, and rural schools. Suendarti & Liberna (2018) research demonstrates that the ICARE model can support students' metacognition, enabling them to generate knowledge will be better. Students and teachers have a reciprocal relationship while using manipulative learning materials, or vice versa.

Suween (2011) research provides support for this statement. It indicates that the use of mathlet (GeoGebra) in the classroom increases student engagement and raises learning achievement levels compared to students not using GeoGebra. Numerous other studies (Putrawan, 2014; Supriadi, 2015; Nopiyani et al. 2016) also reported similar findings, demonstrating that students' learning activities and mathematical communication skills were enhanced by the use of learning devices in conjunction with GeoGebra media. Every learning exercise in the student book that was created is predicated on the ICARE paradigm.

## **CONCLUSION**

The following conclusions can be drawn from the formulation, goals, outcomes, and discussion of the development of the PBL-based educational profession textbook using the ICARE pedagogical approach:

1. The PBL-based Educational Profession Textbook with the ICARE Pedagogic Approach is declared feasible for use in learning; it received good ratings on assessments from material experts, learning design experts, and graphic design experts. The kids' trial results showed an extremely high average score.
2. Compared to learning in the traditional control class, learning in the experimental class using the PBL-based Educational Profession Textbook with the ICARE Pedagogic Approach was more effective. Students eagerly anticipate using the PBL-based Educational Profession Textbook with the ICARE Pedagogic Approach to enhance their learning results in the educational profession course.

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