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Development of 'Statistics Board' Teaching Media for the Statistics Course in the English Language Education Program

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Abstract

This Research developed Statistics Board teaching materials for English Education students at KH Abdul Chalim University. Statistics is important for students' academic writing and Research, but current materials often do not meet the needs of non-mathematics students. The Research used the ADDIE model, which includes analysis, design, development, implementation, and evaluation. Participants were English Education students and expert validators. Data came from expert validation, student questionnaires, and achievement tests, and were analyzed both quantitatively and qualitatively. The results show that the Statistics board materials are valid, practical, and effective. Students found the materials clear, easy to use, and relevant, and their learning outcomes improved. These materials are a suitable alternative resource for statistics courses.

Keywords: Teaching material development; statistics board; English education; ADDIE.

INTRODUCTION

Statistics is a supporting course that plays a crucial role in higher education, particularly in helping students understand, process, and analyze Research data. For English Language Education students, statistics is not only necessary to fulfil the curriculum but also serves as a basis for compiling scientific papers, analyzing language Research data, and evaluating learning. Therefore, statistics learning needs to be contextually designed to align with the academic needs of language students. However, in reality, statistics learning for non-mathematics students still faces various challenges. Many students struggle to understand abstract and mathematical statistical concepts. This is due to the use of teaching materials and learning media that tend to be general, oriented toward mathematics students, and do not adequately relate the material to the context of English language learning. This situation impacts low learning motivation and student learning outcomes.

Theoretically, effective learning requires teaching materials and learning media that are appropriate to the characteristics of students. Good teaching media can present material in a simple, systematic, and applicable manner(Waru & Irfan, 2019), thus helping students gradually develop conceptual understanding. The use of contextual teaching media is also believed to increase student engagement and facilitate the transfer of knowledge to real-world situations, including in the context of language and education research(Numan, 2019). Several previous Research have shown that developing teaching materials or learning media based on student needs can improve conceptual understanding and learning outcomes. However, most research on developing statistics teaching media has focused on students in mathematics or science programs. Research specifically developing statistics teaching media tailored to the characteristics of English Language Education students is

still very limited, especially those that directly integrate the context of English language research. Based on these issues, a research gap exists between the statistics learning needs of English Language Education students and the availability of relevant and contextual teaching media. Therefore, this research is crucial to develop a "Statistics Board" teaching medium specifically designed for Statistics courses in the English Language Education Research Program. The development of this teaching medium is expected to be a more effective learning solution, enhance student understanding, and support English language students' academic and research skills.

REVIEW OF RELATED LITERATURE

The development of teaching media in learning is based on the constructivist theory, which emphasizes that the learning process occurs when students actively construct knowledge through experience and interaction with the learning environment. In statistics learning, abstract concepts require the assistance of teaching media to be understood more concretely(Affandi et al., 2025).Well-designed teaching media can help students relate statistical concepts to real-life situations, particularly in the context of language research and English language education. In addition to constructivism, contextual learning theory (Contextual Teaching and Learning) is also an important basis for developing teaching media(Batubara & Ariani, 2019).

This theory emphasizes the importance of linking learning materials to the context of students' lives and academic fields. In statistics learning, a contextual approach enables students to understand the use of statistics in analyzing language research data, thus making learning more meaningful and relevant(Baharuddin dan Esa Nurwahyuni, 2020). Research and Development (R&D) is an appropriate approach for producing quality educational products (Agustien et al., 2018). R&D focuses not only on testing theories but also on developing and refining learning products through systematic stages. One R&D model widely used in developing teaching media is the ADDIE model, which consists of analysis, design, development, implementation, and evaluation stages. This model allows researchers to make continuous improvements based on validation and trial results.(Amalia, 2020). The analysis stage in the ADDIE model serves to identify learning needs, student characteristics, and problems faced in statistics learning(Bansu Irianto Ansari & Taufiq, 2020). The design stage is used to design the structure of teaching media, learning objectives, and the presentation of materials and practice questions. The development stage involves the process of creating teaching media and validation by subject matter experts and media experts. Next, the implementation stage is carried out through limited trials, and the evaluation stage aims to assess the final quality of the product(Zulfikar & Hilliyani, 2025).

Previous research results indicate that teaching media developed through R&D methods have higher levels of validity, practicality, and effectiveness than conventional teaching media. Teaching media tailored to student characteristics can improve learning motivation, conceptual understanding, and student learning outcomes(Aaker, 1997). These findings reinforce the importance of developing teaching media that is oriented towards user needs. However, a literature review reveals limited research specifically developing statistics teaching media for language Research program students, particularly English Language Education. Most statistics teaching media still emphasize mathematical calculations and do not connect the material to applications in language research or language education. This creates a gap between the material taught and students' academic needs.

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Another research gap lies in the lack of teaching media that prioritizes simplicity, conceptual integration, and clarity of presentation for non-mathematics students. Existing teaching media do not fully consider the background of language students who experience math anxiety. Therefore, teaching media specifically designed to address these challenges is needed. Based on previous theory and research, this Research developed the "Statistics Board" teaching media using the R&D method with the ADDIE model. This teaching media was designed through the steps of needs analysis, contextual material design, development, and validation by experts, limited trials, and product evaluation. The expected end result is teaching media that is content-valid, practical for students, and effective in improving the understanding and learning outcomes of English Language Education students, thereby expanding and complementing Research on developing statistics teaching media for non-mathematics students.

RESEARCH METHOD

This Research employed a Research and Development (R&D) design aimed at developing and testing the feasibility of the "Statistics Board" teaching media for the Statistics course in the English Language Education Research Program. The development model used is the ADDIE model, which consists of five stages: Analysis, Design, Development, Implementation, and Evaluation. This design was chosen because it provides a systematic development flow and allows for continuous product evaluation. Participants in this Research consisted of English Language Education students as users of the teaching media, as well as expert validators, including statistics material experts and learning media experts(Annur, 2020). Students were involved in the limited trial phase to determine the practicality and effectiveness of the developed teaching media.

The instruments used in this Research included: (1) validation sheets from material experts and media experts to assess the validity of the teaching media in terms of content, language, presentation, and appearance; (2) a student response questionnaire to measure the level of practicality of the teaching media; and (3) a learning outcome test to determine the effectiveness of the teaching media in improving students' understanding of statistical concepts(Sugiyono, 2022). Data collection was conducted in accordance with the ADDIE development stages. During the development stage, data were collected through expert validation to obtain input and recommendations for improving the teaching media. During the implementation stage, the teaching media were piloted with students, who were then asked to complete a response questionnaire. Furthermore, a learning outcome test was administered after the teaching media were used to measure student learning achievement.

The data obtained were analyzed using quantitative and qualitative descriptive techniques. Quantitative data derived from expert validation scores, student response questionnaires, and learning outcome tests were used to determine the validity, practicality, and effectiveness of the teaching media. Qualitative data, in the form of suggestions and comments from validators and open-ended student responses, were used to refine the developed teaching media.

FINDINGS

The results of this Research are presented based on the objective of developing the Statistics Board teaching media, which is to produce valid, practical, and effective teaching media for students in the English Language Education Research Program. Data were obtained from expert validation results, student responses, and learning outcome tests after the teaching media were implemented. The validation results by material experts indicate

that the Statistics Board teaching media have a high level of validity. Aspects assessed include the suitability of the material to learning outcomes, the accuracy of statistical concepts, clarity of presentation, and the relevance of the material to the context of English language research. The validator stated that the material was systematically structured, easy to understand, and relevant to the characteristics of language students. Thus, the teaching media meet the eligibility criteria in terms of content and pedagogy.

1. Validation by Material Experts

The validation results by media experts indicate that the Statistics Board teaching media is suitable for use in terms of appearance and readability. Aspects of design, language use, layout, and clarity of illustrations were assessed as good to excellent. The validator suggested minor improvements to the consistency of appearance and emphasis on contextual examples, which were then used as the basis for product revisions prior to implementation. The practicality of the teaching media was demonstrated through the results of a student response questionnaire after using the Statistics Board. The majority of students responded positively to the ease of use, the clarity of the material explanations, and the relevance of the examples and exercises to English research. Students stated that the teaching media helped them gradually understand statistical concepts and reduced the difficulties of the Statistics course.

The validation of the Statistics Board teaching media was conducted by Ms. Anita Shofiana, S.Pd., a material expert. This validation aimed to assess the appropriateness of the teaching media in terms of statistical scientific substance and its suitability for the learning outcomes of the Statistics course in the English Language Education Research Program. Aspects assessed included the accuracy of statistical concepts, the completeness and depth of the material, the systematic presentation, the clarity of examples and exercises, and the relevance of the material to the context of English research. The validation results indicated that the Statistics Board teaching media were valid and suitable for use in learning. The material expert assessed that the material was structured coherently, used language that was easily understood by language students, and was able to help students grasp statistical concepts gradually. Several suggestions for improvement were provided, particularly regarding the addition of conceptual explanations in certain sections and the strengthening of contextual examples. These were then used as the basis for revising the teaching media.

2. Media Expert Validation

Media expert validation was conducted by Ms. Salwa, M.Pd., a learning media expert. This validation aimed to assess the suitability of the teaching media in terms of appearance, design, readability, and language use. Aspects assessed included layout, format consistency, use of illustrations, clarity of symbols, and suitability of the teaching media to the characteristics of English Language Education students. The results of the media expert validation indicated that the Statistics Board teaching media were considered suitable for use. The media expert assessed that the teaching media's appearance was quite attractive, the proportion of text and visuals was balanced, and the language used was communicative and easy to understand. Suggestions provided related to improving the layout and writing consistency were then used as revision material to improve the quality of the teaching media before the implementation stage.

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Validation at the dissemination stage was conducted through the limited implementation of the Statistics Board teaching media in Statistics lessons for English Language Education students. This stage aimed to assess the applicability of the teaching media in real-life learning situations. The implementation results indicate that the teaching media can be used effectively in the learning process, both independently and with lecturer guidance. Students were able to follow the flow of the material, understand the explanations, and complete the provided exercises. This demonstrates that the teaching media is suitable for dissemination and use as a supporting learning resource for Statistics courses. The following documentation demonstrates the implementation of the statistics board in the classroom:

Figure 1.1. Implementation of the Statistics Board

3. Product Trial Results

A product trial was conducted to determine the practicality and effectiveness of the Statistics Board teaching media. Practicality was measured through a student response questionnaire, while effectiveness was measured through a learning achievement test. The trial results showed that students responded positively to the teaching media, especially in terms of ease of use, material clarity, and relevance to academic needs. Furthermore, the learning achievement test results showed an increase in students' understanding of basic statistical concepts after using the teaching media. These findings indicate that the Statistics Board teaching media is not only theoretically feasible but also effective in improving student learning outcomes. Here are some photos of the statistics board application activity for students, along with the results of a sample test on 18 students:

Table 1.1 Student Result on The Product

Nama	Pre-test	Post-test
M1	60	90
M2	70	100
M3	50	90
M4	70	100
M5	45	80
M6	45	80
M7	50	80

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M8	50	85
M9	50	85
M10	45	85
M11	45	85
M12	60	100
M13	70	100
M14	70	100
M15	50	80
M16	40	90
M17	40	85
M18	40	85

Based on the pre-test and post-test results of 18 English Language Education students, it can be concluded that the use of the Statistics board learning materials has a positive impact on improving student learning outcomes. Students' pre-test scores generally fell in the low to moderate range, indicating that their initial understanding of Statistics material was still limited before using the developed learning materials. After implementing the Statistics board learning materials, all students experienced an increase in their post-test scores. The post-test scores showed a significant increase, with most students achieving high and very high scores. This indicates that the Statistics board learning materials are able to help students understand Statistics concepts more clearly, systematically, and applicably, in accordance with the characteristics of English Language Education students.

The uniform improvement in learning outcomes across all students indicates that the Statistics board learning materials are effective for students with varying initial abilities. These teaching materials not only help students with high initial abilities but also improve the understanding of those with low initial abilities, thereby reducing the difficulty of learning Statistics. Thus, it can be concluded that the development of the Statistics Board teaching material through the Research and Development (R&D) method meets the criteria for effectiveness and is suitable for use as an alternative learning resource in Statistics courses in the English Language Education Research Program. The effectiveness of the teaching media is evident in the results of student learning tests after implementation. The data indicate an increase in student understanding of basic statistical concepts, such as data presentation, measures of central tendency, and interpretation of simple analysis results. Students are able to solve the given problems and relate them to the context of language research. These findings indicate that the use of the Statistics Board teaching media has a positive impact on student learning outcomes. The following are the positive impacts of the Statistics Board, resulting in a positive impact in the classroom:

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Figure 1.2. Demonstration of the use statistics board

Based on these overall results, it can be concluded that the developed Statistics Board teaching media have met the criteria of validity, practicality, and effectiveness. These results directly answer the research question: the development of Statistics Board-based teaching media is feasible for use and can improve the quality of statistics learning for English Language Education students.

DISCUSSION

Learning statistics for non-mathematics students, particularly English Language Education students, requires a different conceptual approach than learning statistics for mathematics students. Theoretically, statistics is understood not merely as a collection of formulas and calculation procedures, but as a thinking tool for understanding data and drawing conclusions. This perspective aligns with the view of statistical literacy, which emphasizes understanding the meaning of data, interpreting results, and making data-based decisions. However, in learning practice, this approach is often not optimally implemented due to the limited availability of teaching media relevant to the context of language students. Constructivist theory provides a strong foundation that learning will be more meaningful when students actively construct knowledge through experiences and contexts close to their field of Research(Nurhayati et al., 2025). Within this framework, teaching media serve not merely as a means of conveying information but as a means to facilitate the process of knowledge construction. Compared to traditional learning approaches that focus on lecturers and formulas, the constructivist approach demands teaching media that can link statistical concepts to real-world applications, such as analyzing English language research data. The weakness of conventional learning lies in the lack of context and the limited space for students to understand the meaning behind statistical calculations.

The contextual teaching and learning approach complement constructivism by emphasizing the connection between learning materials and students' real-world needs. In the context of statistics, CTL encourages the presentation of examples, exercises, and case Research relevant to the field of language and language education (Ratnasari & Saefudin, 2018). However, although CTL is widely recommended theoretically, its implementation is often not supported by learning media specifically designed for non-mathematics students. This indicates a disconnect between the adopted learning theory and the learning tools used (Juliansyah, 2018). Research and Development (R&D) methods, particularly the ADDIE model, offer a systematic framework to bridge this gap. Unlike experimental research, which focuses on testing the effectiveness of treatments, R&D emphasizes an

iterative process in producing quality learning products. The ADDIE model allows for the integration of constructivist and contextual learning theories into every stage of development, from student needs analysis to evaluating the effectiveness of instructional media (Amalia, 2020). Thus, R&D is not only technical but also conceptual, linking learning theory with media development practices.

The Statistics Board instructional media developed in this Research are positioned as a synthesis of these various theoretical frameworks. The Board concept emphasizes simplicity of presentation, conceptual integration, and the applicability of statistical material in the context of language research. This approach expands existing literature by offering a teaching media model that is not only mathematically valid but also pedagogically and contextually relevant for language students. Thus, this teaching media addresses the issues of statistical literacy and math anxiety often experienced by non-mathematics students (Hasanah, 2021). The conceptual contribution of this research lies in the formulation of statistics teaching media that integrates constructivist theory, contextual learning, and the R&D approach in an integrated manner(Affandi et al., 2025). Theoretically, this research clarifies how learning media can serve as a bridge between abstract statistical concepts and the academic needs of language students. Practically, these findings provide implications for lecturers and learning developers to design learning media that are more adaptive to student characteristics. For future research, this conceptual model can be further developed by integrating digital technology or tested in the context of other non-mathematics Research programs.

CONCLUSION

This research resulted in the Statistics Board learning media, developed through Research and Development (R&D) methods using the ADDIE model for the Statistics course in the English Language Education Research Program. The results indicate that the developed learning media meet the criteria of validity, practicality, and effectiveness. The validity of the learning media is demonstrated through assessments by material experts and media experts, who stated that the content, presentation, language, and appearance of the learning media are appropriate for the learning outcomes and characteristics of language students. The practicality of the teaching media is evident in students' positive responses to its ease of use, clarity of material explanations, and the relevance of examples and exercises to the context of English research. This teaching media helps students understand statistical concepts in a simpler and more applicable way, thereby reducing difficulties and anxiety in learning statistics. Furthermore, the effectiveness of the teaching media is demonstrated by the improvement in student learning outcomes after using the Statistics Board teaching media in the learning process.

This research significantly contributes to the development of statistics learning for non-mathematics students by presenting contextual and user-oriented teaching media. The Papan Statistics teaching media can be used as an alternative learning resource to support statistical literacy and academic skills in English Language Education students.

For further research, it is recommended that the development of the Statistics Board teaching media be expanded by integrating digital technology or be tested on a broader scale and in other non-mathematics Research programs. In terms of learning practices, lecturers are expected to adapt a contextual approach in teaching statistics to make learning more meaningful and relevant to students' needs.

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