

Learning Innovation in Outcome Based Education: Development of Descriptive Statistics Modules for Islamic Religious Education in Islamic Higher Education

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Abstract: *The current education system in higher education is shifting to the Outcome Based Education (OBE) approach which emphasizes what graduates can do at the end of the learning experience. Therefore, this study was conducted to produce a product in the form of a descriptive statistics learning module based on OBE for the PAI Study Program. This research is included in research and development (R&D) with the ADDIE model. Analysis by analyzing module requirements, design includes the initial module design, development with module feasibility testing, implementation with module practicality testing, and evaluation through testing the effectiveness of the developed module. The results of the research and development show that the developed module is valid and effective. The results of the comparative pretest and posttest tests show that the significance value of the p-value is $0.000 < 0.05$. This means that there is a significant difference between students' abilities before and after using the appropriate descriptive statistics module based on Outcome Based Education (OBE) in learning. The average posttest value (77,74) was greater than the pretest (66,26), indicating that this module is effective for use in learning. The results of this study can be used as a reference for higher education which demands innovation in learning processes and tools that are oriented towards achieving graduate abilities (learning outcomes).*

Keywords: *Outcome Based Education (OBE), development of learning modules, descriptive statistics*

Abstrak: Sistem pendidikan saat ini di perguruan tinggi sedang bergeser kepada pendekatan Outcome Based Education (OBE) yang menekankan pada apa yang dapat dilakukan lulusan di akhir pengalaman belajar. Oleh karena itu, penelitian ini dilakukan untuk menghasilkan suatu produk berupa modul pembelajaran statistika deskriptif berbasis OBE untuk Program Studi PAI. Penelitian ini termasuk dalam penelitian dan pengembangan (R&D) dengan model ADDIE. *Analysis* dengan menganalisis kebutuhan modul, *design* meliputi rancangan awal modul, *development* dengan uji kelayakan modul, *implementation* dengan uji kepraktisan modul, dan *evaluation* melalui uji efektifitas modul yang dikembangkan. Hasil penelitian dan pengembangan menunjukkan bahwa modul yang dikembangkan valid dan efektif. Hasil uji perbandingan *pretest* dan *posttest* menunjukkan nilai signifikansi p-value sebesar $0,000 < 0,05$. Artinya terdapat perbedaan yang signifikan antara kemampuan mahasiswa sebelum dan sesudah menggunakan modul statistika deskriptif berbasis Outcome Based Education (OBE). Nilai rata-rata *posttest* (77,74) lebih besar dari nilai *pretest* (66,26), yang menunjukkan bahwa modul ini efektif digunakan dalam pembelajaran. Hasil penelitian ini dapat dijadikan sebagai rujukan pendidikan tinggi yang menuntut adanya inovasi dalam proses dan perangkat pembelajaran yang berorientasi pada capaian kemampuan lulusan (*learning outcomes*).

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Kata Kunci: *Outcome Based Education (OBE), pengembangan modul, statistic deskriptif*

INTRODUCTION

Responding to global challenges in the era of industry 4.0 heading towards 5.0, the education system is no longer only focused on input and process, but is now starting to shift to output/graduates produced by education providers. The existence of 13.33% of college graduates with unemployed status shows that not all of the higher education graduates produced can be absorbed in the world of work (Rosa, 2023). Therefore, the Outcome Based Education (OBE) approach is the solution to answer these challenges.

OBE is an educational approach designed to prepare graduates at the global level. OBE emphasizes more on what graduates can do at the end of their learning experience (Handayani et al., "Implementation of Outcome-Based Education from the Perception of Lecturers and Students"). so the curriculum design developed in OBE should be specific to the output (Hassan et al., 2016). This is in accordance with what is written that in OBE it is defined as students doing from what is known (Elihami, 2021). In addition, the curriculum designed refers to clear and relevant learning outcomes, the basic principle in implementing OBE is student involvement (Arifin, 2020). Students are encouraged to participate fully in every learning and are given the opportunity to learn more broadly in achieving optimal results. Of course, this is applied in every subject taken by students, including descriptive statistics courses.

These descriptive statistics are effective for collecting, tabulating, and interpreting quantitative data (Huwaيدا, 2019). More (Kaur et al., 2018) states that

measures of frequency, central tendency, dispersion/ variation, and position are all included in descriptive statistics, along with several types of variables (nominal, ordinal, interval, and ratio). Descriptive statistics are also used as an analysis tool in quantitative descriptive research (Irwan and Surachman, 2023).

The function for students in descriptive statistics subject is for quantitative data processing, especially in completing final assignments. Descriptive statistical analysis provides a complete picture of phenomena and facts that allow rational conclusions to be drawn. Likewise, in the field, statistical information is often found in the form of tables and diagrams/graphs or histograms that contain information about a particular situation with numerical characteristics, quantitative numbers. However, this subject is often a problem for students. Many students think that this subject is a difficult course to understand. The results of the researcher's observations while teaching this course, the problems experienced by students in learning descriptive statistics are firstly the school background where most come from madrasahs and Islamic boarding schools.

The absence of a handbook that makes it easier for students makes students less interested in this subject. This certainly has an impact on the ability to absorb statistics lectures where the material is mostly in the form of data, mathematical formula numbers, and the ability to interpret data. In addition, the skills of calculating and interpreting data are also still lacking, as a result students have difficulty in understanding the

material taught both in calculating, reasoning, concepts and applications in everyday life. an data and the suitability of presenting data in the form of tables or graphs.

The outcome based education system focuses on output results, so current statistical learning is encouraged to emphasize more on the skills aspect in statistics, focusing on developing literacy, thinking and reasoning (Kalobo, 2024; Yasin et al., 2025; Namora at al., 2025). Learning is not only in theoretical concepts but also considers aspects of graduate achievements in responding to global challenges. Skills in processing, analyzing and interpreting data distribution supported by the use of computers are certainly a priority today. This is certainly a challenge for lecturers in developing innovations in the lecture process so that the learning achievement objectives in this course are met. Developing modules for learning can be an alternative in improving students' knowledge and skills.

Research related to OBE has basically been carried out by previous researchers, but related to the development of OBE-based teaching materials in courses, not much has been found. For example (Shaheen, 2019; Tambak, 2021) the focus of the research is to investigating the theoretical and philosophical foundation of OBE. Next about trend on 21st-century outcome based education which shows that a mature concept is needed in education 4.0 towards society 5.0. where one of the steps needed is to link non-formal education and Islamic education to spur the quality of life that is characterful and knowledgeable about Islam in activities outside of school (Elihami). Further related to the impact and implications of the implementation of OBE on the creativity and innovation in both curriculum development and learning and supports the implementation of innovative assessment techniques, project-based and collaborative evaluations of lecturers in

higher education (Asbari and Novitasari). Outcome-Based Assessment in The Evaluation of Education Programs (Agir et al., 2018; Tambak et al., 2020) and implementation of OBE such as the implementation of OBE seen from the perspective of lecturers and students (Handayani et al., 2024), and the application of OBE principles in the curriculum of English Language Education study programs (Allo et al., 2024; Rasyidi et al., 2025).

However, a clear research gap remains in the development of OBE-based teaching materials or modules, particularly in the context of university lectures. Studies specifically integrating OBE principles into the development of teaching materials or learning modules are still limited, even though this is a crucial element in ensuring the achievement of desired learning outcomes.

Meanwhile, research on the development of statistical modules has shown positive results on the effectiveness of learning and improving students' statistical literacy. For example, the development of a statistical module for higher education demonstrated that the module made statistical learning more effective (Rangkuti et al., 2020; Tambak and Sukenti, 2023). Further the research also stated that the development of a descriptive statistics module based on statistical reasoning was effective in improving students' statistical reasoning skills (Subekti and Jazuli, 2022). Furthermore, research also shows that the developed statistical module is effective for use in statistics lectures to facilitate students' statistical literacy (Hafiz et al., 2025)

Several studies have concluded that the use of statistical modules can improve students' statistical reasoning skills and make learning more effective and contextual. However, most of these studies have not linked the development of statistical modules to the OBE approach.

Based on the literature review conducted by the researcher, there is a research gap in the development of OBE-based modules or teaching materials that are not only oriented towards delivering material but also systematically designed to support the achievement of student learning outcomes, particularly in statistics courses in higher education. This research is expected to bridge this gap by presenting innovative OBE-based teaching materials that are measurable, applicable, and relevant to the demands of 21st-century education.

The results of previous studies show that the development of competency-based education in the PAI curriculum which is adaptive to technological advances while simultaneously fostering a generation that is intellectually capable, morally based, and practically skilled to navigate the complexities of the digital era can integrate the integration of science, morality, and practical skills which are very relevant in facing the challenges of Society 5.0 (Azis et al., 2024).

So that this research can be said to be unique and has characteristics that can be developed by the PAI study program. It is hoped that the development of this module can produce a teaching module product that is relevant to the needs of this century's learning so that it can produce graduates who are in accordance with the achievements of the study program. Students not only understand theoretical concepts, but can have skills in processing, analyzing and interpreting technology-based data. This research focuses on the development stages of developing a descriptive statistics module based on Outcome Based Education (OBE) of the Islamic Religious Education Study Program (PAI) using the ADDIE model (analysis, design, development, implementation, evaluation).

THEORITICAL CONCEPTS

Outcome Based Education (OBE)

Outcome-based education, defined by Spady (1994), is a higher education system that aims to create the education students need to succeed. Outcome-based education (OBE) refers to the basis for planning a curriculum framework, learning activities, and assessing student abilities as outcomes of education. The curriculum, learning activities, and assessments are designed to meet learning objectives. In accordance with Spady's statement, AUN-QA emphasizes OBE in its Study Program Evaluation Guide Version 4 (2020), which explains how to define, organize, and design a curriculum based on all student needs to complete the educational process. It can be said that OBE emphasizes not only the learning process but also the outcomes of graduates.

Ministry of Research, Technology, and Higher Education explains that the main principles in OBE are five, which include 1) Learning Outcomes focus on learning outcomes based on the graduate profile produced by the study program. 2) Backwards curriculum design, the curriculum contains the formulation of learning objectives, specifications, design, and assessments then developed, 3) Structured suitability (Learning outcome-learning activities-assessment) contains the resulting outputs, learning experiences and assessments carried out, 4) Facilitating learning opportunities, emphasizing the SCL (student center learning) approach, 5) Systematic P-D-C-A Cycle contains PDCA, namely plan, do, check, action. Where "Plan" is related to the curriculum and RPS. "Do" is related to learning activities. "Check" is related to evaluation, and "action" is related to improvements to be made (Arifin, 2020).

The implementation of OBE requires a paradigm shift in education, where lecturers are not only information providers, but also facilitators who help students achieve learning outcomes through various active and measurable

strategies (Surachman and Kusmawati, 2025). In the OBE system, all components of education, from planning, implementation, to evaluation of learning, are arranged based on the final objectives that have been set. In other words, learning success is measured by the extent to which students demonstrate the expected competencies, skills, and attitudes.

Descriptive Statistics Module Based on Outcome Based Education (OBE)

A module is a collection of materials accompanied by practice questions. The objectives of developing a descriptive statistics module for the Islamic Religious Education Study Program are as follows: 1) To facilitate mastery of learning materials to achieve educational goals or specific knowledge, skills, and abilities. 2) The module is presented in a way that enables students to learn independently. 3) The module is written to guide and control the learning process. 4) This module aims to increase student motivation to learn, making learning more focused and programmed, thus making the learning process more efficient and effective. Related to the discussion above, the development of a descriptive statistics module as a compulsory course at the Islamic Religious Education Study Program at STAI Pati is necessary. This course aims to improve quantitative data processing, particularly for completing quantitative final assignments.

Descriptive statistics is a branch of statistics which includes organizing data, summarizing and also presenting data (Larson and Farber, 2018). Descriptive statistics are statistics used to analyze data by describing it as it is without the

intention of drawing general conclusions. Furthermore, descriptive statistics can provide a comprehensive picture of facts from which meaningful conclusions.

The development of a Descriptive Statistics learning module based on Outcome-Based Education (OBE) is a strategic step to ensure the achievement of meaningful, measurable, and relevant learning outcomes to meet the needs of the times. The OBE approach emphasizes that all learning activities must be directed at achieving learning outcomes that have been formulated specifically, both in terms of knowledge, skills and attitudes. Descriptive Statistics as a basic course in the field of statistics has a very important position because it equips students with the ability to understand, process, present, and interpret data systematically.

This module is designed not only to convey theoretical statistical concepts and formulas but also to develop applicable data analysis skills in real-world contexts. This OBE-based module is designed with reference to established graduate learning outcomes (CPL) and course learning outcomes (CPMK). Each topic in the module is complemented by specific learning outcomes, success indicators, active learning activities, and authentic assessments to support competency achievement. The learning approach used is student-centered, where students are encouraged to actively explore data, work collaboratively, and reflect on their learning outcomes. In addition, the development of this module also takes into account the principle of constructive alignment, namely the alignment between learning objectives, learning activities, and assessment strategies. Thus, this module

serves not only as a means of transferring knowledge but also as a thinking skills, which are highly needed in today's data-driven era.

The development of this OBE-based Descriptive Statistics module is expected to encourage students to optimally achieve the expected competencies, while simultaneously improving the quality of the learning process and outcomes in a sustainable manner.

RESEARCH METHOD

This research includes Research and Development (R&D) with the ADDIE model, Analysis, Design, Development, Implementation, Evaluation (Winarni, 2018). The product to be developed is a descriptive statistical module based on Outcome Based Education (OBE) of the PAI Study Program. The stages of research and development with the ADDIE model are as follows (Winarni, *Teori Dan Praktik Penelitian Kuantitatif Kualitatif Penelitian Tindakan Kelas (PTK): Research and Development (R and D)*). For more details regarding the stages of the ADDIE process in developing a descriptive statistical module based on Outcome Based Education (OBE) of the PAI Study Program.

medium for developing critical, creative, and reflective

The subjects in this study were lecturers of statistics, and students of Islamic Religious Education Study Program who took descriptive statistics lectures. While the object is the development of a descriptive statistics module based on Outcome Based Education (OBE) of the Islamic Religious Education Study Program (PAI). The data collection techniques used were observation, interviews, questionnaires, and tests. Observations and interviews with lecturers were used to obtain an overview of the lectures, descriptive statistics were used to compile a module needs analysis, questionnaires were used to obtain data for testing the module's feasibility and practicality, and tests were used to determine the module's effectiveness. Data analysis techniques are descriptive statistics for assessing the feasibility of the module, readability tests, and practicality tests. Inferential statistics are used to determine product effectiveness using paired sample t-tests using a one-group pretest-posttest design, consisting of one class group, with observation values before and after treatment (Irwan and Surachman, 2023).

Table 1. Assessment Criteria Guidelines

Interval	Criteria
$X > \bar{x}_i + 1.5 SB_i$	Very valid/ Very good
$\bar{x}_i + SB_i < X \leq \bar{x}_i + 1.5 SB_i$	Valid / good
$\bar{x}_i - 0.5 SB_i < X \leq \bar{x}_i + SB_i$	Enough
$\bar{x}_i - 1.5 SB_i < X \leq \bar{x}_i - 0.5 SB_i$	Less
$X \leq \bar{x}_i - 1.5 SB_i$	Very less

Source: (Azwar, 2021)

Description

\bar{x}_i = ideal mean score

$$\bar{x}_i = \frac{\text{maximum scor} + \text{minimun scoree}}{2}$$

SB_i = Simpangan baku ideal

$$SB_i = \frac{\text{skor maksimal} - \text{skor minmal}}{6}$$

X = ideal standar deviation

Ideal maximum score = Σ criteria item x
highest response

Ideal minimum score = Σ criteria x lowest
response

RESULT AND DISCUSSION

Result

In developing a descriptive statistical module based on OBE, of course, it is necessary to pay attention to the aspects contained in OBE. Ristekdikti explains that there are five main principles in OBE, which include containing focus on learning achievements focusing on learning achievements based on the graduate profile produced by the study program, backwards curriculum design, the curriculum contains formulating learning objectives, specifications, designs, and assessments then developed, structured suitability (Learning outcome-learning activities - assessment) contains the outputs produced, learning experiences and assessments carried out, facilitating learning opportunities, emphasizing more on the SCL (student center learning) approach, and systematic Cycle P-D-C-A contains PDCA, namely plan, do, check, action. Where *plan* is related to the curriculum and RPS, *do* is related to learning activities, *check* relates to evaluation, and *action* relates to course learning outcomes (CLO) in the descriptive statistics course which

improvements to be made (Arifin). The development stage of the descriptive statistics module based on OBE for the PAI Study Program with the ADDIE model (analysis, design, development, implementation, evaluation) is as follows.

Analysis

The analysis stage includes needs assessment, problem clarification and development goal setting (Zulkifli et al.). Analysis of the needs for developing a descriptive statistics module based on OBE must of course pay attention to the principles in OBE. In addition, it is also necessary to analyze the needs of users, namely students and lecturers in charge of the course. Facts in the field based on the researcher's experience while teaching descriptive statistics show that students find it difficult to follow statistics learning. This is caused by several factors, including those related to the educational background of STAI Pati students, most of whom are madrasah graduates, study while working, are not fresh graduates when entering college, and there are no supporting books for lectures such as module teaching materials developed by lecturers. Based on this, there is a need for a supporting learning module for lectures that can be used by students to study independently according to current global needs.

Design

First, the compilation of this concept map is in accordance with the program learning outcomes (PLO) and consists of 8 learning activities. The module framework consists of an

introduction that includes the course identity, course description, course which includes learning activities, learning steps and assessment components. Identification and determination of PLO and CLO are very important in the OBE method because they will determine learning methods and assessment planning (Wahyudi and Wibowo). Second, the module content section includes learning activities I - VIII, where each learning activity consists of an introduction, sub-CLO, material description, student activities, summary, competency test, empty space for student notes and references. When selecting an application in the module display design, the module cover design: CorelDraw, while the module content design uses Canva. The selection of this module format takes into account the type of font, spacing, column format, icon, empty space (Arsyad, 2016) with module size: UNESCO, 15.5 cm x 23 cm, font/module content size is cambria, 12pt and manuscript space 1.15 spaca.

learning outcomes (CLO), main material, and instructions for using the module suggestions from experts. The first is instrument validation with construct validity through expert judgment, namely by consulting with two experts, namely Lecturers at Nusantara PGRI Kediri University and Lecturers at UIN Sultan Aji Muhammad Idris Samarinda. The results of the validation of the research instrument showed an average of 4.00 in the filling instructions aspect, 3.63 in content, and 3.60 in language, all three of which were very feasible.

Furthermore, the second is the feasibility test of the product produced at the design stage which was carried out by 2 material experts and 2 media experts. Based on table 2 and tabel 3, overall, the developed module meets the aspects of material and media feasibility. This can be seen from the average score of the assessment of the 2 material experts of 3.68 in the very feasible category, while the media expert is 3.89.

Developmet

This stage is intended to produce a revised product based on input and

Table 2. Results of Expert Validation of Material

Aspect	Material Expert		Average	Category
	A1	A2		
Self Intruction	3.47	3.60	3.53	Very Valid
Self Contained	3.67	3.67	3.67	Very Valid
Stand Alone	4.00	4.00	4.00	Very Valid
Adaptive	3.33	3.67	3.50	Very Valid
User Friendly	3.67	4.00	3.83	Very Valid
OBE Criteria	3.40	3.70	3.55	Very Valid
Total	3.59	3.77	3.68	Very Valid

Table 3. Results of Expert Validation of Media

Aspect	Media Expert		Ave-rage	Cate-gory
	A1	A2		
Format	4.00	3.50	3.75	Very Valid
Organization	4.00	4.00	4.00	Very Valid
Attractiveness	3.70	3.80	3.75	Very Valid
Font Shape and Size	4.00	4.00	4.00	Very Valid
White Space	4.00	3.67	3.83	Very Valid
Consistency	4.00	4.00	4.00	Very Valid
Total	3.95	3.83	3.89	Very Valid

Overall, both material experts and media experts gave positive suggestions. However, there were suggestions for improvement given by material experts, including those related to the preparation of CPMK in the introduction, the main material of the discussion should be in accordance with the RPS, there needs to be an example in interpreting data

presentation, an example of sample calculation, steps of work instructions on the material are clarified. Media experts' suggestions include writing the title of the front cover design model, instructions for the QR-Code, too much synopsis on the back cover. Here are examples of before and after repair results from the expert.

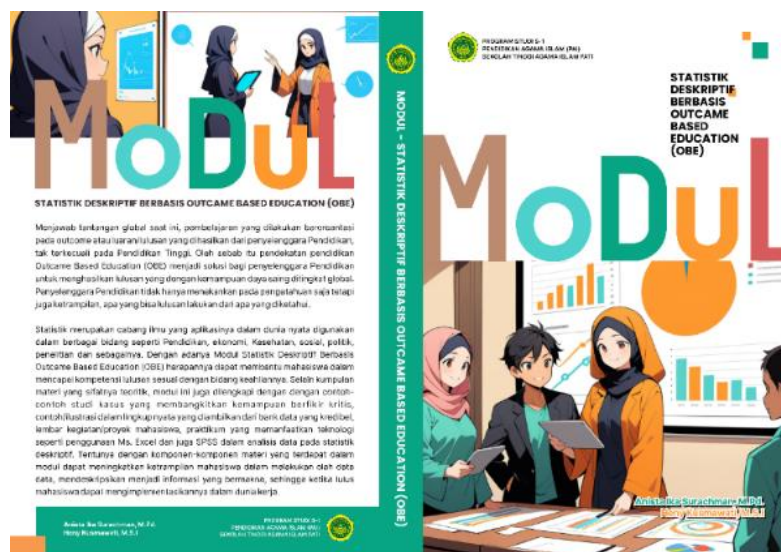
**Figure 1. Initial Design of Front Cover of Module**



Figure 2. Design of Front Cover Module after Revision

Adding interpretation to data presentation material

5. Cara Penyajian Data

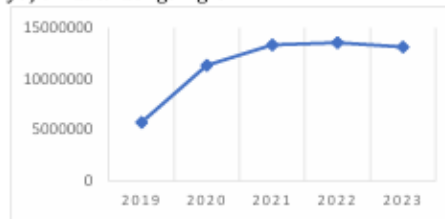
Untuk mempermudah membaca data yang diperoleh, maka data yang diperoleh perlu disajikan agar menjadi lebih informatif. Tujuan penyajian data yaitu untuk mempermudah dalam membaca ataupun menganalisis data. Penyajian data dapat dilakukan dengan menggunakan tabel, grafik ataupun diagram (Astuti, 2016).

a. Penyajian data dengan tabel

Tabel 3.2 Distribusi Jenis Kelamin

No	Jenis Kelamin	Frekuensi
1.	Laki-laki	12
2	Perempuan	15
Total		27

b. Penyajian data dengan grafik

**Gambar 3.2** Grafik Trend Penjualan Kain Batik Toko Antik**Figure 3. Initial View of Data Presentation Material**

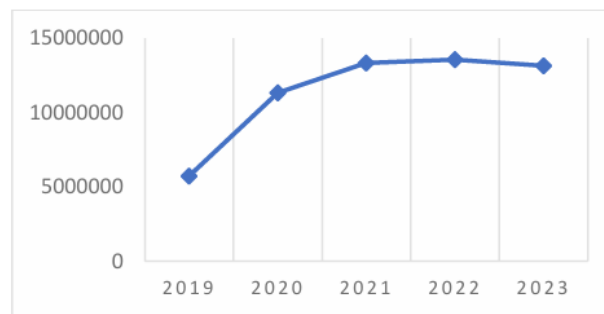
a. Penyajian data dengan tabel

Tabel 3.2 Jenis Kelamin Mahasiswa Kelas A

No	Jenis Kelamin	Frekuensi
1.	Laki-laki	12
2	Perempuan	15
Total		27

Berdasarkan tabel 3.2 tersebut maka dapat dideskripsikan bahwa sebagian besar mahasiswa berjenis kelamin perempuan yaitu sebanyak 15 mahasiswa. Mahasiswa laki-laki yaitu sebanyak 12 mahasiswa.

b. Penyajian data dengan grafik



Gambar 3.2 Grafik Trend Penjualan Buku Toko "Mas Budi"

Berdasarkan gambar trend penjualan buku di toko "Mas Budi" terlihat ada kenaikan dari tahun 2019 sampai dengan 2022. Namun demikian, pada tahun 2023 mengalami penurunan.

Figure 4. View of Data Presentation Material after Revision

Next, Instructions for the barcode used.

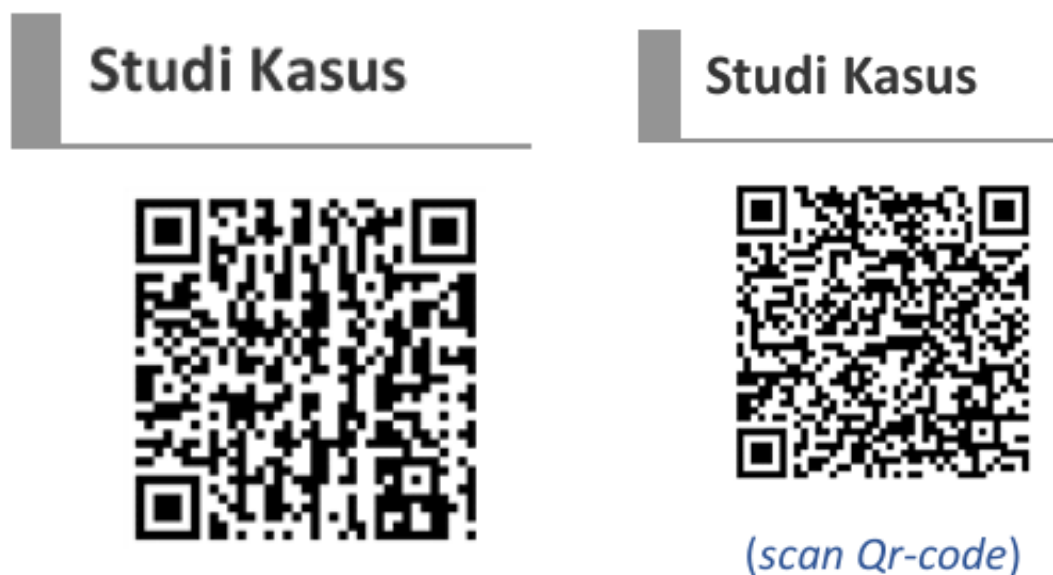


Figure 4. View of Barcode Design Before and After Revision

After improvements were made based on expert advice, a product readability test was then carried out which

was given to 7 PAI Study Program students, and the result:

Table 4. Average Product Readability Test by Students

Student	Aspect			Average
	Content	Language	Presentation	
M1	3.29	3.67	3.38	3.44
M2	3.29	3.33	3.50	3.37
M3	3.57	4.00	3.75	3.77
M4	4.00	3.67	3.88	3.85
M5	3.86	3.33	3.63	3.61
M6	3.29	3.33	3.63	3.41
M7	3.14	3.00	3.63	3.26
Ave-rage	3.49	3.48	3.63	3.53
Cate-gory	very good	very good	Very good	Very good

Table 4 shows the average total score for the readability test of 3.53, which means it is in the very good category.

Implementaion

The draft results of the readability test are then implemented to the users to assess the practicality test of the resulting product users, namely descriptive statistics lecturers and PAI study program students at STAI Pati. The practicality test of users from the lecturer's side includes aspects of material, language, presentation, assignments/evaluation/exercise,

usefulness, and ease. Overall, the developed module falls into the very good category with an average of 3.46. The practicality test of PAI study program students was given to 20 students. Students were given an assessment instrument in the form of a questionnaire. Based on the results of the user practicality test seen from 3 aspects, namely usefulness, ease and presentation.

Table 5. Distribution of Product Practicality Tests by Students

Cate-gory	Useful-ness		Easi-ness		Presen-tation	
	F	%	F	%	F	%
Verry good	11	55.0	11	55.0	14	70.0
Good	8	40.0	9	45.0	6	30.0
Enough	1	5.0	0	0.0	0	0.0
Less	0	0.0	0	0.0	0	0.0
Very less	0	0.0	0	0.0	0	0.0
Total	20	100	20	100	20	100

Based on Table 5. it is known that most of each aspect is included in the very good category. Furthermore, in the good and

quite good categories. This means that students show a positive response to the development of descriptive statistics

modules based on Outcome Based Education (OBE) of the Islamic Religious Education (PAI) Study Program.

Evaluation

The evaluation stage is to conduct an overall evaluation of the developed product. This is done so that the descriptive statistics module based on Outcome Based Education (OBE) is appropriate for learning. The learning simulation was carried out in 2 meetings on the data presentation material where in this activity the researcher took pretest data on student abilities at the first meeting and posttest at the second meeting. The results of the comparative pretest and posttest tests showed that the significance value of the p-value t-count was $0.000 < 5\%$ significance level. This means that there is a significant difference between student scores before and after using the descriptive statistics module based on Outcome Based Education (OBE) appropriate for learning. The average posttest value (77.74) was greater than the pretest (66.26) indicating that this module is effective for use in learning.

Discussion

The current education system that is shifting to outcome based education (OBE), makes this research conducted to produce a module product of Descriptive Statistics Module Based on Outcome Based Education (OBE) in Islamic Religious Education Study Program (PAI) which can later be used as a learning support. Based on the stages carried out in the ADDIE model, it shows that the developed module is valid and effective for use in learning descriptive statistics courses.

Basically, the research emerged based on the number of students who

considered this course to be a difficult course to understand. In addition, the school background where most of them came from madrasahs and Islamic boarding schools, there were no textbooks that made it easier for students, making students less interested in this course (Tambak and Sukenti, 2025). This certainly has an impact on the ability to absorb statistics lectures where the material is mostly in the form of data, mathematical formula numbers, and analytical skills in interpreting data. In addition, the skills of calculating and interpreting data are also still lacking, as a result students have difficulty understanding the material being taught (Tambak et al., 2025). The difficulties experienced by students vary, ranging from skills in calculating, conceptual reasoning, to application in everyday life. This is in accordance with who stated that the difficulties that arise are making, interpreting, and applying histograms in a real environment (Zaidan et al., 2012). Furthermore mentioned the difficulties that arise in terms of classifying various types of data and the suitability of presenting data in the form of tables or graphs (Maryati and Priatna, 2018).

Modules can be said to be one of the most popular teaching materials for students. This is because the material contained in the module is specific, detailed and certainly makes it easier for students to learn independently which is used as support in the learning process (Drastiawati et al., 2025). Modules are very easy to use, with basic instructions already in them and the language used in the module reflects the teaching language, so that teachers do not directly teach or talk to students (Kumanireng, 2020). The purpose of the module is so that it can be

studied independently, educators are not too dominant in the teaching and learning process, train honesty, accommodate all students abilities in learning, and measure the extent of their ability to master the material they have learned (Prastowo, 2015; Tambak et al., 2021). The preparation of the module is of course based on the desired learning achievement objectives. This is in accordance with the characteristics of OBE which teaches students to be more independent in the learning process, accustoms students to take the initiative from other sources that support learning activities, and provides freedom to seek information in terms of honing their own abilities.

In the OBE system, the learning system that is carried out focuses on output, where learning is not only on cognitive achievement, but also pays attention to the value system and skills needed by graduates. In the developed module, learning activities are conducted using a student-centered learning approach using project-based learning and problem-based learning methods. The application of descriptive statistics in projects supports the achievement of specific and measurable learning competencies according to the Outcome-Based Education (OBE) approach. This is in line with the results of previous research which stated that PjBL can improve competency (Tambak, Sukenti, et al., 2024). Likewise with PBL, where with this method, descriptive statistics learning becomes more lively and meaningful because students not only learn concepts but also experience directly how statistics are used to solve real problems, thereby improving their social competencies as

students (Tambak, Marwiyah, et al., 2023). Through PjBL and PBL, students can strengthen their competencies in critical thinking, data analysis, and evidence-based decision-making, all of which are important in outcomes-based education (OBE).

The characteristic of the OBE system is student-centered learning. This is also stated in the developed module. Students are encouraged to participate fully in every learning and are given the opportunity to learn more broadly in achieving optimal results. Because in implementing learning for generation Z, which is characterized by confidence, creativity, and always connected or what we know as 3C (confident, creative, and connected), is a challenge in itself that must be responded to quickly. In facing this challenge, it is necessary to prepare an active, innovative, creative, and effective learning strategy that is oriented towards OBE (Soni, 2020; Tambak et al., 2020). In addition to students developing more independence in seeking and finding knowledge through reality and field dynamics such as ability requirements, real problems, social interactions, collaboration, self-management, performance demands, targets and their achievements.

In addition, new literacy skills and abilities that are centered on character integrity which include data, technology, and human literacy are very much needed now (Suryaman, 2020; Tambak et al., 2023). The systematics of this OBE module are more focused and in accordance with user needs, and produce an innovative, interactive, and effective learning module (Kumanireng, 2020; Tambak, Sueknati and

Firdaus, 2024). In interactive learning, lecturers must have deeper abilities in developing learning materials, communicating and explaining the usefulness of learning materials (Handrianto et al., 2016; Tambak and Sukenti, 2023).

The OBE Education System focuses on output results, so current statistical learning is encouraged to emphasize more on aspects of statistical skills, focusing on developing literacy, thinking and reasoning (Kalobo, 2016; Tambak et al., 2021). The results of previous research stated that to improve student learning outcomes by using the OBE concept as a role model in developing learning tools (Harmaman and Musriani, 2024). Learning is not only in theoretical concepts but also considers aspects of graduate achievements in responding to global challenges. Skills in processing, analyzing and interpreting data distribution supported by the use of computers are certainly a priority today. Learning activities are no longer carried out conventionally but prioritize creative, innovative learning methods and strategies by utilizing technology. This is because technological literacy, data utilization and the internet are components of literacy that are very much needed in the future (Martini, 2020). In this digital era, the ability to use technology effectively is one of the most important competencies for students (Murtadho et al., 2023).

Previous research on 21st century skills shows that digital skills evolve sequentially, building on digital information skills, making them key future skills that teachers must have and can be passed on to future generations

(Saikkonen and Kaarakainen, 2020). The OBE-based descriptive statistics module developed contains elements of technology utilization where the data that appears in the material, examples or competency tests are integrated with the use of the internet. This is done so that students' learning resources are not only from conventional books but also follow the development of the latest data available. This is in accordance with Nasution's opinion which states that the use of internet technology is expected to increase students' learning resources (Nasution, 2018; Tambak and Sukenti, 2025).

The utilization of technology in the developed module is not only in the utilization of the internet but also the utilization of computers and learning support software. Along with the development of the era, of course the development of software and learning support applications is also increasingly sophisticated which can facilitate its users (Nasution, 2018). By adopting and utilizing computer and communication technology in education, learning becomes more active (Alnajdi, 2018). The developed module is equipped with material that is applicable and practical in nature related to data processing in computerized descriptive statistics, both simple ones using Microsoft Excel or the utilization of statistical software with SPSS. This is done to support graduates' skills in facing global challenges. In accordance with what was stated that in facing challenges and opportunities in the global era in the Islamic religious education study program, it is necessary to utilize digital platforms to share knowledge and enrich students' understanding and skills (Aprianti et al., 2024). This is intended, in addition to

forming student learning independence, also to accustom students to update data from accessible data banks such as the Central Statistics Agency (BPS), and Satudata from the Ministry of Religion and student skills in statistical data processing.

CONCLUSION

Based on the results of the study and discussion, it can be concluded that this study produces a descriptive statistical module product based on Outcome Based Education (OBE) in the PAI Study Program which is valid and effective for use in descriptive statistical learning in the S-1 Islamic Religious Education Study Program. This is shown in the development stage of product validation results both by material experts and media showing a very feasible category with the assessment of material experts obtaining an average score of 3.68 and media experts of 3.89. Based on the results of the readability test from 7 students with an average result of 3.53 (very good). The implementation stage, the results of the practicality test of product users from statistics lecturers showed an average score of 3.46 (very good), the practicality test on 20 students showed that most student responses were in the very good and good categories; and 5) evaluation, the results of the comparative pretest and posttest tests showed that the significance value of the p-value t-count was $0.000 < 5\%$ significance level. This means that there is a significant difference between the students' scores before and after using the appropriate Outcome Based Education (OBE) based descriptive statistics module in learning. The average posttest score (77.74) is greater than the pretest (66.26) indicating

that this module is effective for use in learning descriptive statistics courses.

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