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Evaluating Educational Concepts Mastery of Prospective Teachers in Ambon: An-ex-post-facto Study from Comprehensive Examination Result

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Abstract: Evaluating Educational Concepts Mastery of Prospective Teachers in Ambon: An-ex-post-facto Study from Comprehensive Examination Result. **Objectives:** This study aims to describe prospective teachers' education field comprehensive examination results. **Methods:** A descriptive ex-post-facto method is employed to obtain data from students who took the final project on three study programs (Islamic Education, Biology Education, and Mathematics Education) in one of Ambon's Education Institutes of Education Personnel. Through observation and documentation, comprehensive examination scores of 108 students (27 males; 81 females) were obtained. Further, this data was analyzed using presentation techniques on six sub-components of the comprehensive educational exam. **Findings:** The results showed that the average ability of prospective teacher students was 83.94% (high category). **Conclusions:** Some prospective teachers were unable to adequately explain teacher competence and teaching theory. Therefore, they have to improve their capability in this topic.

Keywords: learning outcomes, prospective teacher, comprehensive, Education field.

Abstrak: Evaluasi Penguasaan Konsep Pendidikan Calon Guru di Ambon: Studi Ex-post-facto Hasil Ujian Komprehensif. **Tujuan:** Penelitian ini bertujuan untuk mendeskripsikan hasil ujian komprehensif-bidang pendidikan mahasiswa calon guru. **Metode:** Metode deskriptif ex-post-facto digunakan dalam penelitian ini, untuk mendapatkan data dari mahasiswa yang memprogramkan tugas akhir pada tiga program studi (Pendidikan Agama Islam, Pendidikan Biologi, Pendidikan Matematika pada salah satu Lembaga Pendidikan dan Tenaga Kependidikan di kota Ambon. Data diperoleh melalui studi dokumentasi hasil ujian komprehensif bidang pendidikan berupa skor yang diperoleh dari 108 mahasiswa (27 laki-laki; 81 perempuan). Data dianalisis menggunakan teknik persentase pada enam sub komponen ujian komprehensif-bidang pendidikan. **Temuan:** Hasil penelitian menunjukkan bahwa rerata kemampuan mahasiswa calon guru adalah 83,94% (kategori Tinggi). **Kesimpulan:** Masih ada mahasiswa yang belum dapat menjelaskan dengan baik tentang teori belajar dan kompetensi guru, mengindikasikan bahwa penguasaan bagian ini perlu diperkuat lagi.

Kata kunci: hasil belajar, calon guru, komprehensif, bidang pendidikan.

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■ INTRODUCTION

Comprehensive is a course to assess undergraduate students who have studied for at least six semesters or have earned at least 110 credits. They need to pass all compulsory courses (excluding electives) as per their study plan. However, some universities do not give credit for comprehensive (0 credits). Regardless, comprehensive is a course that each student has to take in order to complete their studies. This course includes thesis proposal seminar, examination results, and final exams or *munaqasah* (undergraduate thesis, thesis, dissertation). The cognitive domain is the focus of the comprehensive examination that is usually accomplished through a variety of tests, such as written, oral, or memorization tests (Nurasyiah, 2016; Mertasari, 2016). The test results from the evaluation are factored into the assessment of the *munaqasah*.

Generally, before *munaqasah*, students have to take a comprehensive examination before the committee or it can be separated based on the field of the exam. This test is conducted to assess students' scientific mastery of their study program. Before the exam, the department or the study course distributes thorough exam materials and the exam is made based on these materials (IAIN Ambon, 2013). The material for the comprehensive exam consists of several primary courses that serve as the study program's identity as specified in the study program's curriculum framework and regulated in the guidebook. Dean or personnel with the same level appoints the examiners for the comprehensive examination by decree or letter of appointment in which three lecturers will be examiners. Before moving to the final exam (*munaqasah*), students are required to pass this exam to ensure that they have met the requirements (Biro Skripsi, 2015).

The evaluation system in higher education is an assessment mechanism used to determine

student progress or success in achieving the educational goals that have been set by the department's or study program's curriculum. These evaluations can be done by providing an assessment of student's academic capability, practicum/internship, comprehensive, and final exam. The goals include assessing the efficacy of lecturers' learning processes, assessing curriculum effectiveness, and obtaining feedback to improve the learning process. Because it is process-oriented, it values the process over the outcomes (Natsir, 2010; IAIN Ambon, 2013).

Comprehensive examinations for final-year students at the Education Institutes of Education Personnel (LPTK/*Lembaga Pendidikan Tenaga Kependidikan*), such as the Faculty of Tarbiyah and Teacher Training, are in accordance with the characteristics of the Higher Education Curriculum (KKNi/*Kerangka Kualifikasi Nasional Indonesia*). The exams are intended to simultaneously explore students' abilities in understanding course material in the subject group of institutes, faculties, and study programs, and receive feedback to help lecturers and departments/study programs improve the learning process. These topic groupings lead to mastery of three domains or sub-exams: religion, education, and study program science. If a student passes the comprehensive exam, they are eligible to register for the final exam or *munaqasah*. However, if they fail, they have to retake the exam in the field in which they failed (IAIN Ambon, 2013; FTIK IAIN Ambon, 2018; IAIN Ambon, 2018).

LPTK undergraduates are prospective teachers for the title of Bachelor of Education who will become prospective teachers after completing a series of processes and phases because lecturer and teacher are professions that require principle of professionalism (Huda, 2009). There are two types of performance competencies of the teaching profession: a set of

generic or performance competencies and a set of enabling competencies. Generic competencies can be obtained through educational practice. These activities include Field Experience (PPL/*Praktek Pengalaman Lapangan*), Integrated Teacher Professional Practices (PPKT/*Praktek Profesi Keguruan Terpadu*), or similar. On the other hand, enabling competencies can be obtained through lectures or education processes (Suyitno, 2009; Sa'ud, 2013). Comprehensive examinations can be considered as a part of the quality of education. At a level of education, quality can be achieved through optimal processes and procedures in learning. The quality should focus on creating a good figure (student) as it has been expected (Toatubun, 2011; Banawi & Banawi, 2017).

Most educators have considered assessment as summative and assessing learning outcomes that have enhanced assessment's orientation as a measure of learning performance. However, the purpose of assessment is not limited to this matter as it can also help students to develop their skills. If the evaluation is employed as "assessment for learning" and "assessment as learning," student abilities can be improved (Koksal & Cogman, 2013; Wulan, 2018). Assessment as learning focuses on learning tools whereas assessment for learning focuses on reflection and improvement from feedback.

If data on learning outcomes is analyzed, feedback and learning reflection can be done. Creating a profile and table of learning outcomes specifications is a technique to examine student learning outcomes. By using this method, exam results can be used effectively by creating a table of standards for student achievement on a concept or theme. It can be done by grouping the items according to indicators on concepts or themes (Mardapi, 2008). As a result, educators (lecturers) can obtain several visual images of

student learning outcomes, both individually or as a group, in several aspects of a course or several fields of science in one or several test periods. Assessment result or learning outcomes profile is useful for educators in their decision-making process since it can be used to reflect on and improve learning programs and activities (Kompasiana, 2015; Jusuf et al., 2018).

As it can be seen from the preceding description, it is important to create a profile of prospective teachers' comprehensive examination outcomes. However, student's profile of their comprehensive examination result is still minimal. Furthermore, an investigation on the six sub-components of the comprehensive examination in the field of education for prospective teachers is yet to be done. The six sub-components are related to the eight basic teaching skills that a teacher is expected to master (Miflahussirojudin, 2009) and four teacher competencies. It is in form of mastery of information, values, attitudes, and personality, and abilities represented in the teacher's responsibilities (Latuconsina, 2011; Subhan, 2012). Therefore, this study needs to be conducted. However, this study only investigates the six sub-components of the comprehensive examination at a religious LPTK, which are (1) explaining the significance of the research topic or theme on teaching and lectures, (2) explaining three of the eight teaching skills, (3) explaining at least two known learning theories, (4) explaining at least two competencies that a teacher/prospective teacher must possess, (5) explaining the teacher's/prospective teacher's position in the study material, and (6) explaining the implementation and the benefit of the research topic or theme for the school. As per the background of the study, this study aims to investigate the comprehensive exam result profile of the prospective teachers in the field of education. This study is expected to enrich student

mastery of educational materials as a learning reflection that may inspire them to take corrective actions and further study.

METHODS

Research Design

This is a descriptive study using ex-post-facto method. In this study, there is no treatment given by the researcher or a causal relationship that is not manipulated (Sappaile, 2010). This research was conducted from August to December 2021.

Participants

The subject is the prospective teachers at one of LPTK in Ambon, Indonesia, who have completed a comprehensive exam in the 2020/2021 Academic Year and come from three different study programs (Islamic Education, Biology Education, and Mathematics Education). The subjects were selected using cluster proportional random sampling. There are 108 subjects (27 male and 81 female) taken half of 216.

Instruments

The object is the scores on the six sub-components or the comprehensive examination aspects. A tabulation table of comprehensive exam scores is the study instrument. The research instrument used was adapted from the comprehensive examination assessment form of the Faculty of Tarbiyah and Teacher Training at IAIN Ambon, the test instrument used has met content validity because it measures certain objectives in line with the material provided (Arikunto, 2006) and the test reliability was 0.88 (high category).

Procedures

The data was collected through observation and document study on the comprehensive examination assessment sheet, results, and student answers scoring (Abdillah, 2013). The

scoring follows the applicable guidelines as per the standard operating procedure (IAIN Ambon, 2018). The following is the maximum score for each of the six components of the exam: 15, 10, 20, 25, 10, and 20 (the total score is 100). The pass threshold is e" 65.

Data analysis

Descriptive statistics are used to present data in tabular form (measure of central tendency, measure of diversity) and graphs so that they are easy to understand. The data were analyzed by calculating the percentage of the scores on each of the six components or the total number of questions. The percentage score of each aspect was obtained by comparing the score with the total score multiplied by one hundred percent (Mardapi, 2008; Kadir, Natsir & Banawi, 2015).

Proportion (P), or difficulty index, and Discriminatory (D), or discriminatory power index, were used to observe the characteristics of the questions using the following formula: Question difficulty index, $P = (S_A + S_B) / (2N \times (Score_{max} - Score_{min}))$. Discriminatory power index, $D = (S_A - S_B) / N \times (Score_{max} - Score_{min})$

(Noll et al., 1979; in Nurgiyantoro, 2013). S_A = the number of correct scores for the upper group; S_B = the number of correct scores for the lower group; $Score_{max}$ = the highest score of an item; $Score_{min}$ = the lowest score of an item; and N = the number of subjects or testees of the upper and lower groups (27.5%). The classification of P is as the following: Difficult (0.00 – 0.30); Neutral (0.31 – 0.70); and Easy (0.71 – 1.00). The classification of D is as the following: Poor (0.00 – 0.20); Fair (0.21 – 0.40); Good (0.41 – 0.70); and Very Good (0.71 – 1.00) (Arikunto, 2006).

RESULT AND DISCUSSIONS

One way that can be used to analyze student learning outcomes in this paper is to create a profile and table of specification of learning

outcomes in the form of scores on the six sub-components or aspects of the comprehensive exam-in the field of education. The six sub-components are: (1) explaining the significance of the research topic or theme on teaching and lectures, (2) explaining three of the eight teaching skills, (3) explaining at least two known learning

theories, (4) explaining at least two competencies that a teacher/prospective teacher must possess, (5) explaining the teacher's/prospective teacher's position in the study material, and (6) explaining the implementation and the benefit of the research topic or theme for the school. The description of the scores obtained by students, as in Table 1.

Table 1. Comprehensive-education question statistics

Element	Score Number	Score Number	Score Number	Score Number	Score Number	Score Number	Total Score
	1	2	3	4	5	6	
N Valid	108	108	108	108	108	108	108
Missing	0	0	0	0	0	0	0
Mean	12.9815	8.6667	15.6667	20.6208	8.8981	17.1111	83.9444
Std. Error of Mean	.22091	.15000	.33932	.36546	.13217	.27227	.77427
Median	13.6486 ^a	9.0794 ^a	16.5333 ^a	20.6905 ^a	9.2206 ^a	17.6842 ^a	85.1000 ^a
Mode	15.00	10.00	10.00	20.00	10.00	20.00	85.00
Std. Deviation	2.29580	1.55882	3.73416	3.79798	1.37358	2.82953	8.04640
Minimum	5.00	5.00	5.00	5.00	5.00	10.00	60.00
Maximum	15.00	10.00	20.00	25.00	10.00	20.00	98.00
Sum	1402.00	936.00	1692.00	2227.00	961.00	1848.00	9066.00

a. Calculated from grouped data.

Based on the data in Table 1, the characteristics of the six exam questions can be described as follows: the first question states the importance of the research topic/theme for education and teaching. The highest score and mode of this question is 15 with the lowest score of 5. It means that most of the students are able to answer this question correctly. The mean score of Number-2 is 8.67. On questions Number-2, Number-5, and Number-6 the mode is the same as the highest score, thus most students are able to answer these questions well. While in question Number-3, the mode is equal to half of the maximum score for that number. This means that only half of the students are able to explain at least two known learning theories while the others are still wrong. Question Number-4, the mode score is smaller than the highest score ($20 < 25$). This means that not all students are able to explain at least two competencies that must be possessed by a teacher/prospective teacher. Theoretically, the examinees are a heterogeneous population.

Thus, when subjected to a test, the results will be reflected in a normal curve. Most of them are in the middle area, a small part is on the left and right tails of the curve

(Arikunto, 2006; Haryono et al., 2022). Table 1 data shows that the mean is smaller than the median, and the median is larger than the mode, so the curve is not symmetrical (tends to be left skewed). The results of this study tend to be in line with research conducted by Abdillah (2013) that conceptual errors are common mistakes that are often made by students related to the lack of basic abilities.

The test results above can help us make an objective assessment of the tests that have been prepared and can be improved through the identification of questions. The identification of the questions carried out is related to the characteristics of the questions, namely: Difficulty Index (P) and Discrimination (D) Comprehensive-Educational Questions. The results of the analysis, as in Table 2.

Table 2. Difficulty (P) and discriminatory index (D) of the comprehensive education questions

Number	S_p	S_d	N	Score _{max}	Score _{min}	P	D
1	411	342	30	15	1	0.83 (easy)	0.16 (poor)
2	287	218	30	10	1	0.82 (easy)	0.26 (fair)
3	535	402	30	20	1	0.77 (easy)	0.23 (fair)
4	702	522	30	25	1	0.81 (easy)	0.25 (fair)
5	272	253	30	10	1	0.86 (easy)	0.07 (poor)
6	556	461	30	20	1	0.84 (easy)	0.17 (poor)

Based on the analysis of item Number-1, it is shown that this item is relatively easy ($P = 0.83$), but has poor discriminatory power ($D = 0.16$). Questions Number-2, Number-3, and Number-4 are quite easy with enough differentiating power. Question Number-5 is easy ($P = 0.86$) with poor discriminating power ($D = 0.07$). Question Number-6 is easy ($P = 0.84$) with poor discriminatory power ($D = 0.17$). The six questions are relatively easy, but have Discrimination (D) with sufficient and bad categories. The characteristics of the questions are derived from the scores obtained by students. It is strongly suspected that these results are related to the time in solving the existing problems. The time provided in working on the exam questions is not enough so that it affects the scores obtained by students. In fact, the tests carried out are basically not speed tests, but ability tests (Mardapi, 2008; Masole & Howie, 2013). The results of this study have not seen the relationship between length of study and comprehensive exam scores as has been done by Medika & Tomi (2020).

Given that a written test (description) favors power tests over-speed tests, it would be important to consider the availability of time to answer the questions. In certain cases, students may open their books to find information relevant to topics that demonstrate concept application, problem-solving, or a generalization (Sudjana, 1991; Myyry & Joutsenvirta, 2015; Senkova et al., 2018). It would be preferable if the assessment for learning and the assessment as

learning are synergized to increase the implementation and the benefit of a comprehensive examination. Learning reflection, feedback on learning improvement, learning facilities improvements, such as test instruments and processes, and time availability has to be taken into account and improved (Houston, Fraser & Ledbetter, 2008; Wulan, 2018, Sone & Gboyega, 2021).

The fact that the test is being implemented as a measurement does not negate the possibility of measurement errors originating from either the object or the participant. One of the leading reasons for measurement errors is bias. Different students with the same abilities may receive a different score. This is quite likely given that comprehensive tests are administered both vocally (memorization) and in writing (description) (Nurasyiah, 2016; Mertasari, 2016). The assessment may include aspects such as writing neatness or composition, participant discipline, and other emotive dimensions. Furthermore, it has been discovered that teacher education institutions lack the competency standard reference for the development of educators in assessments (Moskal & Mines, 2013; Wulan, 2015). One method to reduce bias is by utilizing an assessment rubric that monitors the assessors to keep on track (Timuçin & Kokoç, 2011; Segara, 2014). In addition, assessment development standards have to be met in which test materials have to be prepared and provided to students. The test material design has to take into account graduate competency criteria and

important concepts that should be taken as linking items (Kumaidi, 1999; Erden & Ozer, 2013).

The test score (comprehensive-education exam) can be adopted as diagnostic data to explore the strengths and weaknesses of learning outcomes (Duskri, Kumaidi & Suryanto, 2014; Banawi et al., 2018). The achievement of

students' abilities on the six questions tested can provide an overview of students' abilities in these sections. The percentage of student achievement in each item indicates the achievement by the group. This percentage is obtained from the comparison of the average score of the items with the highest score for each item (Table 3).

Table 3. Student's ability achievement percentage of each item

Number	Average Score	Score _{max}	Average Mastery (%)
1	12.98	15	86.54
2	8.67	10	86.67
3	15.67	20	78.33
4	20.62	25	82.48
5	8.90	10	88.98
6	17.11	20	85.56
Mean			83.94

The mean score of Number-1 is 12.98 or 86.54% of students were able to state the importance of the research topic/theme for education and teaching. The mean score of Number-3 is 8.67 or 86.67% of students were able to explain three of the eight teaching skills. The average ability of prospective teacher students was 83.94% (High category). In this case, lecturers can get information on areas of the course that are difficult for their students by observing the student learning outcome profile. This information can then be shared among

lecturers of the same subject or those who work as examiners in the same field (Mardapi, 2008; Rogers, 2011; Zhou, Kim & Kerekes, 2011).

The comprehensive examination results are more than just the score and which question is wrong. The results can be used to analyze the pattern of student learning mastery (Table 3). The comparison of the student's position against the passing grade and the results of the six questions reveals the concepts or themes that the students are still lacking (Duskri, Kumaidi & Suyanto, 2014; Baylon, 2014).

Table 4. Pass percentage of each item

Number	Completed	0%	Not Completed	0%	Total	0%	Explanation
1	105	97.22	3	2.78	108	100	Failed if the ratio of the score with the maximum score for each item < 65%
2	99	91.67	9	8.33	108	100	
3	86	79.63	22	20.37	108	100	
4	94	87.04	14	12.96	108	100	
5	102	94.44	6	5.56	108	100	
6	99	91.67	9	8.33	108	100	

The first question, there are three students (2.78%) who failed. Question Number-2, also found that 9 or 8.33% of students have yet mastered three of the eight teaching skills. Question Number-3, there are 22 (20.37%)

students who failed in which they could not explain the known learning theories. The fourth question has the lowest average mastery score after the third question, by the students. There are around 12.96% or 14 students were unable to explain

the competencies that must be possessed by a teacher/prospective teacher well enough. Question Number-5, It was found that six participants could not explain the related position (researcher) in the material. Similar to question Number-2, in question Number-6 there are about 8.33% or 9 students could not explain the implementation or the benefit of their research theme or topic for the school Classically, the six questions have met the learning mastery requirements. The results of this study are in line with previous research (Damis, 2018) that a

comprehensive exam is carried out to test the ability and determine the competence of prospective teachers. Students who have not passed will need to take a re-examination.

From Table 4, Figure 1 was made. From the figure, it can be inferred that that question number 3, which is related to students' ability to explain known learning theories, has the highest score of incompleteness. Question number 4 relates to the ability to explain at least two competencies that a teacher/prospective teacher must possess.

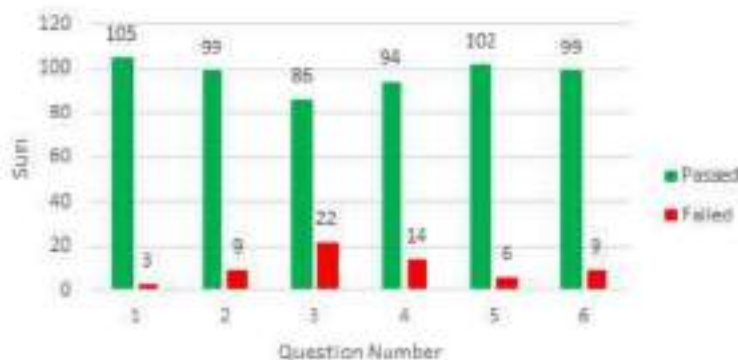


Figure 1. Completeness percentage of each item

The results show that students who have not passed should be given attention. The attention can be done in form of remedial test, tutoring, and group study (Abdillah, 2013; Karagöl & Bekmezci, 2015). To achieve comprehensive learning, students who have not passed could take remedial tests related to the question in which they failed. Those who failed can learn on their own and take an assessment test by answering several questions or completing an assignment. Moreover, the remedial test process can be done based on an agreement between the students and their respective lecturers (IAIN Ambon, 2018; Sulistiawati, Sulistyowati & Lefudin, 2021). Therefore, the learning outcomes (third and fourth question)

require special attention because there were less than 90% of students who could pass. These two questions are related to the professional knowledge of teachers. As prospective teachers, students are required to understand and master this knowledge properly (Cameron, Mulholland & Branson, 2013). Prospective teachers are required to understand the three dimensions of teacher professional knowledge in addition to the curriculum, subject matter, and pedagogical content knowledge (Purwianingsih, 2011; Monsour et al., 2013; Xu & Brown, 2016; Lee, Capraro & Capraro, 2018; Nilsson & Karlsson, 2019).

The finding of students who were unable to adequately explain learning theory and teacher

competence implies that the knowledge mastery of this section is still lacking. This is likely related to students' knowledge about the educational or pedagogic foundation. Based on the observation, several educational courses can be found, but there is no educational or pedagogic foundation course. This finding emphasizes the importance of these courses that are needed to be included in the educational study programs that are a part of the LPTK. Education course lecturers must develop pedagogy as a common ground for graduates and in a study program as an educational institution. It can be done by making a pedagogical foundation as a compulsory course (Supriatna, 2014; Pliushch et al., 2022).

Computer-based examination, which has several advantages compared to traditional exams, is a method to improve the credibility of the comprehensive examination. It can also be done by designing an evaluation system that automatically corrects description answers based on the closeness of sentences on student answer sheets, such as utilizing Google Forms (Hikamudin, 2015; Hayatin, 2015; Zupanca & Posni, 2017; Arbiyanto & Ekohariadi, 2021). In addition, information obtained during this examination can be used for educational research and as a foundation for developing future education policies. These results would benefit students, lecturers, and faculty leaders ² material for diagnosing student competency and improving lectures (Ma'rifah, 2017; Yona & Kim, 2010; Ibrahim et al., 2012; Akerson et al., 2017).

■ CONCLUSIONS

The average abilities of the prospective teacher include: (1) explaining the significance of the research topic or theme on teaching and lectures (86.54%), (2) explaining three of the eight teaching skills (86.67%), (3) explaining at least two known learning theories (78.33%), (4) explaining at least two competencies that a teacher/prospective teacher must possess

(82.48%), (5) explaining the teacher's/prospective teacher's position in the study material (88.98%), and (6) explaining the implementation and the benefit of the research topic or theme for the school (85.56%). It was found that the average ability is 83.94% (High). In general, the six questions have met the learning mastery requirements. This study found that six questions in the field of education were able to describe the ability profile of prospective teacher's in ¹ three study programs (Islamic Education, Biology Education, and Mathematics Education) in terms of educational insight.

Limitations and Implications

In addition to having advantages in this study, there are also a number of limitations. These limitations include: there is no treatment given to the subject because it only focuses on the scores of six questions in the field of education obtained by students. There is more than one examiner in the field of education so that it can lead to bias in scoring. The scores used as research material do not include other comprehensive examination areas (religion and study program science). Item analysis conducted using classical ⁴ theory has not yet applied item response theory. The results of this study have several implications ¹ in the field of education, among others: some prospective teachers were unable to explain teacher competence and teaching theory well enough. Therefore, their capability in this topic needs to be improved further. For example, by requiring the Dean for Educational or Pedagogic Foundation to be a compulsory subject in the curriculum of the study program. Lecturers need to use a conceptual approach in teaching learning theory and teacher competencies. Improvements in the appearance of test instruments and implementation procedures by the academic department of the faculty are absolutely necessary. Development of computer-based comprehensive exam test instruments to facilitate

the provision of feedback. The results of the study suggest to the next researcher to conduct further research related to all fields of comprehensive examinations (education, religion, and scientific study programs) with a larger number of study programs, the implementation of computer-based tests and the use of item response theory in the analysis of test results.

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