Mentoring And Developing Pedagogical Evaluation Instrument For Preservice Teacher To Overcome Teaching Misconception

Mery Berlian, Rian Vebrianto, Nurhasnawati

Abstract: Teachers are the most important factor contributing to students' misconception of a particular material. If teachers misunderstand and wrongly explain a concept of learning, the students will also accept incorrect conception. Thus, it is very important for teachers to have pedagogical evaluation of their competence. In this study, the researchers developed a teacher pedagogical development instrument to overcome student misconception. This research is a research development that develops an instrument to evaluate pedagogical competence. From the results, it is known that the instrument consists of 3 parts: Part A that contains the background of the respondents' demographic, Part B that contains an open questionnaire of pedagogical skills, and Part C that contains an open questionnaire of scientific integration, concepts and media and learning resources as well as obstacles faced by teachers. From the validity and reliability tests, it is known that the croanbach alpha value of all pedagogical skills is 0.94 which consists of 10 constructs of competence of pedagogical skills. This means that the instrument developed is highly credible and effective in enhancing pedagogical skills of preservice teachers and has clear implication for producing professional teachers.

Index Terms: pedagogical skills, instrument mentoring and development.

1. INTRODUCTION

Having decent education is a must and necessity for every one to improve the quality of life. Therefore, education must be able to empower all components of society and participate in realizing the objectives as clearly stated in the National Education Goals in Law No. 20 Year 2003 that national education is aimed to develop the potential of students to become human beings who have faith and devote to God Almighty, self-control, personality, intelligence, noble character, and skills, society, nation, and country[1]. To realize the goals of the National education, every citizen should pursue formal learning process at schools[2]. By considering the important role of science for life, Winaputra stated that knowledge is a weapon for children to be used wisely to live, not to commit error or damage nature. Thus, providing children with practical knowledge is aimed to help them facing modern life that is both practical and appropriate, instill scientific life attitudes, provide skills and educate them to respect the discovery of science, science workers who have contributed a lot to the world and humanity in general. In line with this, Science is a subject about nature and natural phenomena that occur in the real world that is necessary to study at schools. Nature that is meant here includes living things such as humans, animals, plants, viruses, bacteria and inanimate objects. From this understanding, as human beings endowed with intelligence more than any other creature of God, we should be able to understand that this nature was created to be studied by humans so as to produce knowledge that is beneficial to human life[3]. The general vision of higher education is to create educated people to have good characters, to be intelligent and skilled to build a dignified and highly competitive nation, to have comprehensive capabilities, and to create prosperity, security, welfare and justice. This objectives can be achieved if higher education curriculum is developed effectively to meet the needs of students, develop values, science and technology, skills, mental attitude and ethics to become citizens as well as responsible global citizens, and contribute to building civilization, benefit, and happiness for the nation in particular and humanity in general[2]. In line with the policy of higher education strategy to carry out its functions in the XXIst century, every education unit should have a system to produce quality graduates. As a process of system, higher education will have four main stages, namely (1) input, (2) process, (3) output and (4) outcomes which all influence each other in education system (Megawati, 2010). The institutions that contributes to the quality of education are LPTK as the preservice teacher training provider, schools as the service training provider, and MGMP as the organizer of inservice training.

Furthermore, the Regulations of the Government of the Republic of Indonesia Number 19 Year 2005 concerning National Education Standards and Number 32 Year 2013 concerning Amendments to National Education Standards article 1 paragraph 8, explicitly confirm that educators and staff personnel must fulfill the criteria and eligibility of pre-service and in service educators. Teacher is a professional educator with the main task of educating, teaching, guiding, directing, training, assessing, and evaluating students in early childhood education through formal education, basic education and secondary education. Professional teachers will produce quality educational processes and results in order to create intelligent and competitive citizens, namely people who have faith and are devoted to God Almighty, noble, healthy, knowledgeable, capable, creative, independent, democratic and responsible. To become a professional teacher, one should have the ability to develop aspects of competency. Based on the Regulation of the Republic of Indonesia Number 14 Year 2005 concerning Teachers and Lecturers, teacher competencies include pedagogical competencies, professional competencies, social competencies, and personality competencies. With good pedagogy, teachers will have the ability to solve the problem about student misconception[3]. Student misconception in learning often occurs from elementary school to university level. Misconception will hinder the process of receiving and assimilating new knowledge, so that it will hinder students' success in learning process.

- *Mery Berlian is Lecture at Department of Agribusiness, Open University, Indonesia. Email : mery@ecampus.ut.ac.id*
- *Rian Vebrianto is Lecturer at Faculty Tarbiyah and Teacher Training, State Islamic University of Sultan Syarif Kasim Riau, Indonesia. Email : rian.vebrianto@uin-suska.ac.id*
- *Nurhasnawati at Faculty Tarbiyah and Teacher Training, State Islamic University of Sultan Syarif Kasim Riau, Indonesia.*

Misconception that occurs in learning Biology subject at schools remains a major problem and the focal point of educational research in recent years[4]. Misconception happens because students have wrong initial knowledge of the initial concept or the student's initial concept is correct, but they are wrongly connect the concept. The concepts contained in one material are interconnected with the concepts in the next materials, so that students should have correct understanding of concepts[5].

RESEARCH PROBLEM

Teachers are the most important factor contributing to students' misconception of a particular material. If teachers misunderstand and wrongly explain a concept of learning, the students will also accept incorrect conception. Misconception happens because students have wrong initial knowledge of the initial concept or the student's initial concept is correct, but they are wrongly connect the concept. The concepts contained in one material are interconnected with the concepts in the next materials, so that students should have correct understanding of concepts. There are many scholars in education field that have limited pedagogical understanding. However, this is an important thing to be concerned in order to avoid student missunderstanding because there are many preservice teachers who have difficulty in teaching and managing the audience or students in the learning process. This makes the learning process do not go well. The lack of understanding is very likely to cause student misconception. Hence, mentoring and developing pedagogical evaluation instrument for preservice teacher to overcome teaching misconception is needed.

RESEARCH OBJECTIVE

The aim of this research is to improve the pedagogical skill and competency of teacher candidates from FTK SUSKA RIAU to overcome student misconception. Moreover, this study was carried out to develop a highly qualified model to improve the pedagogical skill and competency of students of FTK MI and Tadris IPA UIN SUSKA RIAU to meet professional, social, and industrial needs.

Specifically, the objectives of this study are as follow.

1. To design and develop a model to improve teacher pedagogical competence
2. To create a learning instrument model to overcome student misconception

THE RELATIONSHIP OF TEACHER PEDAGOGICAL SKILL AND STUDENT MISCONCEPTION IN LEARNING PROCESS

Pedagogical skill is a dominant professional quality needed in teaching and learning process. In this study, the researchers analyzed pre-service teachers' understanding level through their pedagogic skill that have three criteria, namely: misconception, do not know the concept (guessing) and know the concept. In learning process at schools, sometimes teachers forget about their important roles to explore students' potential or hidden talents. In this case, pedagogical skill is needed by the teachers in order to facilitate and direct students to carry out the teaching and learning process effectively, efficiently and innovatively to avoid misconception. Pedagogic skill allows the teachers to think and maximize product outcome as expected in the learning objectives. Knowledge is the initial process of learning for students that is obtained through daily experience from the process of assimilation or initial information, so that an accommodation with other information is formed to form a balance (aquilibration) recorded in their brain. Students get their initial knowledge from the process of seeing, hearing, feeling and understanding the surrounding environment without formal teaching, or is called as preconception. Preconception helps students to understand the environment around them, although sometimes preconception is not in accordance with the reality. The knowledge owned by students before learning is called as initial knowledge or preconception[6]. Preconception is the main basis or benchmark of student ability in learning. Thus, it helps them to understand concepts based on the experience gained. Early knowledge in everyday life has many objects to observe. On the other hand, concept is an abstract idea that is generalized from specific examples. Teaching concept involves the use of many and proficient examples. Tennyson and Park in Robert E. Slavin explained that students should follow three rules when presenting concepts, namely: give examples from easy to difficult and select examples differ from one another and can compare and differentiate each example. According to Piaget, concept does not have objective procedures that are directed. It is only in the form of understanding that involves various things and aspects contained therein[7]. Concept should be formed by means of abstraction. The process of abstraction requires time and a lot of experience with objects in a variety of different situations. In addition, according to Amin in Achmad Ansori, concept is an idea based on certain relevant experiences and can be generalized that is formed if two or more objects are distinguished based on general characteristics, form or properties[8]. Furthermore, Webster in the book written by Joel J. Mintzet et al, defined knowledge as the power to make an experience so that it eases people to understand according to the right concept. Someone can be said to understand or have understanding if[9]:

a. the understanding build is in accordance with the understanding of others.
b. the differences in views or understanding possessed by someone meet the common ground.
c. the explanation given does not require proof or theory.
d. the views given can be supported by applicable conceptual standards and methodologies of scientific paradigms.

Understanding is the process of meaningful learning as the basis for understanding the process of knowledge occurrence. According to Ausubel theory, meaningful learning differs from rote learning to learn meaningfully[10]. Thus, students must have new knowledge for concepts that are true to the knowledge they had before. On the other hand, memorizing knowledge is obtained through verbal and random memories in its incorporation in the structure of knowledge that is owned, yet the person does not pay attention to the knowledge he/she has. Hence, teacher pedagogical competence is important in teaching[11]. Understanding concept is aimed to see a person's thoughts, not only about what is known but also how to think about information that is built, organized, stored, taken and manipulated. Assessing conceptual understanding is like a glass or camera that can capture and evaluate individual or group images of a concept at a particular time[12]. Misconception does not only happen to students, it can happen to teacher. Therefore it is necessary to evaluate

teacher pedagogical competence. Teacher and student are said to understand if the construction or development of thought they have is in accordance with the concepts contained in scientific science. Understanding makes teacher and student have meaningful knowledge about a concept. With meaningful learning, teacher and student can choose new knowledge that is in accordance with the concepts had by experts. Misconception refers to a concept that is not in accordance with scientific understanding or the understanding explained by experts in a particular field, then it is said that misconception is a mistake and is an incorrect relationship between concepts[13]. Hasan Sahid and Bilal said that misconception is an understanding that is not in accordance with scientific reality[14]. Fowler and Jaoude defined misconception as the understanding of the concept term, mistakes in clarifying examples of concepts, doubts about different concepts, not appropriate in connecting various concepts in the hierarchical arrangement or making generalizations of excessive concepts or unclear[15]. Based on some of the defeinitions aforementioned, misconception can be interpreted as an understanding that is not in accordance with the understanding or what is explained by scientists. Teacher and Student who have misconception will continue to instill wrong concepts of a knowledge in their cognitive knowledge so that further analysis is needed regarding the sources and causes of misconception.

HOW TO IDENTIFY MISCONCEPTION

Before trying to overcome misconception happened to teachers, it is necessary to know where they got the misconception, after that misconception can be identified. One method that can be used to identify misconception is through Certainty of Response Index (CRI) method. CRI can explore understanding, level of confidence associated with the understanding and identify misconception. Hasan et al (1999) stated that CRI is obtained by using respondents' answers, in this case the teacher. In this instrument, the choice of status of the level of understanding refers to teacher pedagogical skill[16]. Certainty of Response Index (CRI) is invented by Saleem Hasan. This method is used to identify the occurrence of misconception as well as to be able to distinguish it by not knowing concepts and understanding concepts. This method is a tool used to measure the level of confidence/certainty of respondents in answering each question given that has been adapted by the researcher.

2 RESEARCH METHODS

The method used in this study is descriptive research method. Descriptive method is a method that examines the status of the conditions and systems of thought of a group of people on an event that occurs at the present time. Descriptive method can be used to describe something in a systematic, factual and accurate manner according to the facts, nature and careful relationships[17]. Research and development design is aimed to produce competency instruments for teacher pedagogical skill.

Research Respondent

The subjects of this study were pre-service teachers from elementary school/Madrasah Ibtidaiyah and Tadris Science study programs in Faculty of FTK UIN SUSKA RIAU. The number of respondents was 61 from the two study programs.

Research Instrument

Research instrument is important to help the reseaerchers to achieve the objectives of the study for they depends on to measure something[17]. The perfect research instrument is the one that is able to measure precisely what permissions change and answer the questions raised correctly. In this study, the instrument is consisted of a complete set of instrument that was developed based on the constructs contained in Pedagogical skill, which consisted of 3 parts namely Part A that contains the background of the respondents' demographic, Part B that contains an open questionnaire of pedagogical skills, and Part C that contains an open questionnaire of scientific integration, concepts and media and learning resources as well as obstacles faced by teachers.

Research Procedure

This research was done through 3 stages, namely, preparation, implementation, and analysis stages.

a. Preparation Stage
   In this stage, the research instrument in the form of CRI Misconception test for pre-service teacher was made. For requirements analysts, the design used document and profile analysis of the skills needed. The expert judgment used to develop the competency improvement model instrument, for the initial stage, with Pearson correlation is a procedure that is often used by researchers to identify, subtract and arrange instrument items into certain constructs under a single dependent variable in the study[17]. The validity of the instrument can be seen from the correlation value of the corrected item-total correlation based on Pearson correlation coefficient between scores for each item related to the total score without the items concerned.
b. Implementation Stage
   In this stage, the researchers determined the implementation in preparing the test process for the instrument. The test on the evaluation of pedagogical competency of preservice teachers was carried out in PGMI and Tadris IPA study programs at FTK UIN SUSKA RIAU, that was taken by 61 respondents. This number has represented and is sufficient to conduct an analysis of the development of the instrument.
c. Data Analysis Stage
   The CRI test result obtained was classified into 3 categories, namely knowing concept (TK), misconception (M), and not knowing concept (TTK), and then the percentage of the answers for each of the categories was calculated.
   After that, the researchers did validation and testing by using a questioner analysis of Pedagogic skill with Alpha Croanbach analysis using SPSS 22. The result is used as the basis in the development of pedagogical evaluation instrument. The assessment of the development of this product was done by evaluating the pre-service teachers. The result of the analysis is used as the basis for revising the product prototype.

3 INSTRUMENT DEVELOPMENT RESULTS

3.1 General Overview of Research Instrument

This study was aimed to produce a credible and effective instrument for assessing the generic skills of pre-service

teachers of Islamic elementary school and Tadris Science study programs at Universitas Islam Negeri Sultan Syarif Kasim, Riau. The mentoring process was done through a neat and gradual process in order to get an instrument that fits the purpose where in the Instrument designed in this study is composed of a complete set of instrument that was based on the constructs contained in Pedagogical skill, which consist of 3 parts namely parts A about respondent's background, part B contains closed questionnaire of Pedagogical skill, and part C contains open questionnaire. Part A that contains the background of the respondents' demographic consits of: name (initial), study program, gender, ethnicity and computer course and contact number. The pedagogical skill studied is the respondents' skill in using computer. In Part B contains an open questionnaire of pedagogical skill, namely Mastering the characteristics of students (based on physical, moral, spiritual, social, cultural, emotional, and intellectual aspects), Mastering Learning Theory and the principles of Educating Learning, Developing related curriculum with the subjects taught, Utilizing information and communication technology for the benefit of learning, Facilitating the development of potential learners to actualize the various potentials possessed, Communicating effectively, empathically, and politely with students, Carrying out assessment and evaluation of the learning process and results, Utilizing the results of assessment and evaluation for the benefit of learning, able to design and carry out research that is relevant to the learning problem according to the rules of scientific research and take reflective action to improve the quality of learning.

Part C that contains an open questionnaire of scientific integration, concepts and media and learning resources as well as obstacles faced by teachers in the form of objective questions and brief essays.

3.2 Instrument Validity and Reliability

The instrument used in this study was analyzed in advance by experts, both expert lecturers and teachers who were involved in Madrasah Ibtidaiyah/elementary school and Tadris IPA study programs. In creating and assessing credible and effective research instrument, the researchers reviewed the instrument according to the parts.

Respondent Profile

Instrument Part A only needs to be adjusted and agreed by the experts in accordance with the research objectives to analyze the research respondents. The variables studied can be seen and used for further research.

Questionnaire

Instrument part B is in the form of a questionnaire. The validity and reliability tests were performed by using SPSS 22 software. Instruments Parts A and C were approved by the experts. In this study, the instruments were spread to students from two study programs namely Madrash Ibtidaiyah Teacher Education and Tadris IPA. The results were then selected. A total of 61 good and rightly answered instruments were obtained and adjusted to the proposal and were then analyzed. The result of the validity test using Pearson analysis was used and the data was compiled and then forwarded to see the reliability of the instrument rather than the research data as shown in the table below.

Table 3.1 *Instrument Validity based on Corrected Item-Total Correlation and Cronbach Alpha Reliability Index for Each Construct of Pedagogical Skill*

Construct of Pedagogical Skill	Statement	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
I. Knowing Student Characteristics based on physical, moral, spiritual, social, cultural, emotional, and intellectual aspects	Understand the stages of student's personal and behavioral development	0.644	0.938
	Understand various types of students' intelligence based on their characteristics	0.593	0.938
	Understand various aspects of student development based on their characteristics	0.613	0.938
	Understand the stages of students' intellectual abilities development	0.579	0.938
	Understand the stages of students' emotional intelligence development	0.682	0.937
	Understand the stages of students' spiritual intelligence development	0.456	0.939
	Understand the process of students' social aspects development	0.640	0.937
	Can describe the diversity of students' social skill based on their characteristics	0.276	0.940
	Can describe the stages of students' moral aspects development	0.501	0.939
	Can describe the characteristics of adolescent physical development	0.313	0.940
	Can identify the students' potential in the subjects taught	0.453	0.939
II. Mastering Learning Theory and principles of Educative Learning	Able to choose the learning material that is related to the learning experience and objectives	0.472	0.939
	Able to organize learning material correctly in accordance with the approach chosen and the characteristics of students	0.683	0.937
	Able to understand the principles of educational design	0.593	0.938
	Able to develop components of learning design	0.396	0.939
III. Develop a curriculum related to the subjects being taught	Able to develop a complete learning design for activities in the classroom, laboratory, and outside the class	0.636	0.938

	Able to carry out educative learning in the classroom, laboratory and outside the class by taking into account the required safety standards	0.428	0.939
	Able to determine the appropriate learning experience to achieve goals	0.098	0.942
	Able to carry out teaching and learning process in the classroom, laboratory and outside the class by taking into account the required safety standards	0.456	0.939
	Able to take transactional decisions in learning that are in accordance with the developing situation	0.404	0.939
IV. Utilizing information and communication technology for learning purposes	Able to utilize information and communication technology in learning	0.153	0.940
	Able to use learning media and learning resources that are relevant to the characteristics of students	0.507	0.939
	Able to determine the form of ICT that fits the topic	0.538	0.938
V. Facilitating the development of potential learners to actualize the various potentials they have	Able to provide a variety of learning activities to encourage students to achieve optimal performance	0.422	0.939
	Able to identify students' ability based on their knowledge	0.621	0.938
	Able to facilitate differences in students' skills to help them to get optimal achievement	0.569	0.938
	Able to carry out learning that facilitates differences in students' ability based on their knowledge to achieve optimal learning achievement	0.699	0.937
VI. Communicate effectively, empathically, and politely with students	Able to prepare students' psychological conditions to take part in the game through persuasion and examples	0.411	0.939
	Able to effectively engage students to take part	0.201	0.941
	Able to respond to students effectively	0.204	0.940
	Able to teach students politely	0.233	0.940
VII. Carry out assessment and evaluation of the process and learning outcome	Able to determine aspects of the process and learning outcomes that are important to be assessed and evaluated according to the characteristics of the subjects taught	0.576	0.938
	Able to develop instruments for assessment and evaluation of processes and learning outcomes	0.558	0.938
	Evaluate the learning process and results	0.211	0.940
VIII. Utilizing the results of assessment and evaluation for the benefit of learning.	Able to use information from the results of assessments and evaluations to determine mastery level in learning	0.547	0.938
	Use information from the results of assessments and evaluations to design remedial programs	0.391	0.939
	Use information from the results of assessments and evaluations to design Enrichment programs	0.578	0.938
IX. Able to design and carry out relevant research according to scientific research principles	Able to identify variables in research	0.681	0.937
	Able to determine the exact problem formulation in research	0.514	0.938
	Able to make the right research hypothesis	0.568	0.938
	Able to make a class action research proposal prepared systematically	0.654	0.937
X. Perform reflective actions to improve the quality of learning.	Able to reflect from the learning that has been carried out	0.590	0.938
	Able to make a report from the results of classroom action research prepared in accordance with systematic research results	0.445	0.939
	Able to use research results for the purpose of improving the quality of learning in the subjects taught	0.599	0.938
Teacher Pedagogical Skill (0.94)		10.000	0.937

Based on Corrected Item-Total Correlation and Croanbach Alpha Reliability Index for each pedagogic construct and statement items in this study, it is showed that the overall croanbach alpha value obtained from the total construct is 0.94. Thus, this research instrument has a good reliability index and is credible and effective. In addition, if it is seen from corrected item-total correlation for all constructs in this research instrument, the score is greater than 0.30. According to Nunally (1978), if the corrected item-total correlation exceeds 0.25, the items have high validity and may be used to measure the constructs involved in the study. Therefore, from the above table, it can be concluded that the instrument or pedagogical skills questionnaire has been proven to have high validity and reliability and this makes this mentoring instrument credible and efficient for assessing pedagogical skill of pre-service teachers.

4 CONCLUSION AND SUGGESTION

4.1 Conclusion

Based on the results of this study, it can be concluded that improving pedagogical competencies of pre-service teacher is needed to make the learning process in the classroom run effectively and efficiently. From the mentoring and the development of the instrument that have been carried out, it is known that a complete set of instrument is developed based on the constructs contained in pedagogical skill, which consist of 3 parts, namely Part A that contains Respondent Background (demography), Part B that contains enclosed questionnaire of pedagogical skill, and Part C that contains

objective questions and descriptions relating to the integration of scientific concepts and pedagogy, media and learning resources as well as teacher obstacles. From the results of the study, it is known that the total Croanbach alpha value of the pedagogical competency evaluation questionnaire is 0.94. Therefore, it can be concluded that the instrument developed by the researchers has good validity and reliability, this means that this instrument is highly credible and effective in improving pedagogical skill of pre-service teachers.

4.1 Suggestion

For further research, the subject could be developed more fully, not only for students who are prepared to become teachers, but also study books to improve the competence, quality, and professionalism. The increase of competence and mastery of good concepts will produce quality pre-service teachers and improve the progress and development of the nation, “Better Teacher, Better Future”.

REFERENCES

[1] Mardia Hayati, Desain Pembelajaran Berbasis Karakter, (Pekanbaru: Al-Mujtahadah Press, 2012), hlm

[2] Wina Sanjaya, Strategi Pembelajaran Berorientasi Standar Proses Pendidikan, (Bandung: Kencana, 2006), hlm. 2.

[3] Evi Suryawati, (Lppm: laporan penelitian stranas , 2014), hlm. 6.

[4] Hidayati, Irma. Analisis Miskonsepsi Guru dan Buku Teks Biologi Kelas XI SMAN pada Materi Sistem Saraf di Kabupaten Nagan Raya. Tesis. Banda Aceh: Universitas Syiah Kuala. 2013. Hlm, 1..

[5] Kusumaningrum, Ratri. Pengaruh Model Guided Discovery Learning terhadap Miskonsepsi siswa kelas XI IPA SMA Muhammadiyah 1 Karanganyar pada Konsep Sistem Imun. Skripsi. Surakarta: Universitas Sebelas Maret. 2014. Hlm, 2-3..

[6] Yasin Kutluay, “Diagnosis Of Eleventh Grade Students” Misconceptionsabout Geometric Optic By A Three-Tier Test”, Tesis Master, Middle East, Technical University. TurKay, 2005, p.l.

[7] Robert E. Slavin. Psikologi Pendidikan Teori dan Praktik. (Jakarta:PT Indeks, 2008), h.299.

[8] James P. Byrnes, Cognitive Deveplopment and Learning, (America: Pearson and AB, 2009), Third Edition, h.15

[9] Joel J. Mintzet et al, Assesing Science Understanding, (California: Elsevier Academic Press, 2005), h. 42

[10] Ibid, h. 8.

[11] Joseph. D. Novak, D. Bob Gowin, Learning How to Leearn, (America:Cambridgae University Press, 1984), p. 7..

[12] Mintzes, op cit, p.202.

[13] Paul Suparno, Miskonsepsi dan Perubahan Konsep dalam pendidikan fisika. (Jakarta: PT Grasindo, 2005), h. 4.Mintzes, op cit, p.202.

[14] Hasan Sahid & Bilal, Developing Three-Tier Minconception Test About Regular Circular Motion, Journal of Edecation , 2011, p. 278-292.

[15] Achmad Z. Ansori. “Miskonsepsi dalam pembelajaran sains di Madrasah Ibtidaiyah”’ Jurnal Edukasi, tt, h.3.

[16] Hasan, Saleem, dkk. Misconceptions an The Certainly Of Respon Index (CRI). Phys. Educ. 34 (5), PD,1999. 294-299.

[17] Moh Nazir, Metode Penelitian, (Bogor:Ghalia Indonesia, 2011), h. 54.