Self-perceived assessment skill of prospective physics teachers

R Efendi*, N Y Rustaman2 and I Kaniawati1

1Department of Physic Education, Universitas Pendidikan Indonesia, Bandung, Indonesia
2Science Education, Universitas Pendidikan Indonesia, Bandung, Indonesia

*Corresponding author’s e-mail: ridwanefendi@upi.edu

Abstract. Assessment skills are an important component of assessment practice, without adequate assessment skills it is unlikely that teacher assessment practices will produce desired student learning outcomes. This study was conducted to reveal self-perceived assessment skills of prospective physics teachers by using quantitative descriptive analysis, and involving 92 prospective physics teachers who were experiencing teaching practice in junior high school and final project related to assessment. Data was collected by using Self-Perceived Assessment Science Skills Questionnaire consisted of 29 items related seven assessment competencies was developed and used in the study. Internal consistency reliability coefficient for the total scale scores was 0.87 as measured by Cronbach's alpha. Determination of self-perceived assessment science skills detected from prospective physics teachers was carried out in descriptive statistics, in the form of respondent average values. Research findings show that self-perceived assessment skills of prospective physics teachers was categorized as transition.

1. Introduction
Assessing students' learning progress is one of the most crucial skills that new science teachers need to develop if they want to make informed decisions in class [1]. Beginning teachers need to know how to elicit students’ ideas and assess student learning [2]. Recent studies have also confirmed the importance of self-perceived competence in educational assessment when considering teachers’ educational assessment [3]. Research on self-perceptions of skills concerning educational measurement has shown that perceived usefulness and relevance of educational measurement is positively related to perceived skillfulness in assessment [4].

In general education literature, several study has uncovered perception of assessment competencies by using self-reported. Study of teacher assessment competencies based on seven standard of teacher competencies in assessment education by using and calibrating the Assessment Practice Inventory to reveal teacher’s self-perception of their assessment competence [5]. The finding show that the competence of teachers in using the result of assessment to make decisions is the most difficult competency, while the competence of communicating the result of assessment is the easiest competency to perform. Another study of designed and calibrated a personal report of survey instrument related to the practice of high school teachers from seven state school in Illinois, founded that item on aggregating, scoring, and interpreting assessment result and using assessment result to make decisions are the items that most easily approved by teachers. Contradictory, the items related to choosing the right assessment
method and developing a valid assessment procedure are the most difficult items approved by the teacher [6].

The teachers with measurement training, irrespective of teaching experience, reported a higher level of perceived skillfulness in educational assessment than those without measurement training [7]. It results imply that formal training in educational measurement might convey to teachers that they are capable of performing classroom assessment tasks, teachers also need a clear vision about the usefulness and relevance of the training to daily classroom assessment practices. In other words, raising teachers to the desirable level of assessment literacy, measurement training should simultaneously give attention to teachers’ knowledge, skills, and attitudes related to educational measurement. It could be argued that measurement training in pre-service teacher education needs to introduce knowledge and skills within an authentic classroom context for prospective teachers to practice what has been learned. This critical feature of the pre-service teacher education program might help future teachers develop a deeper understanding of educational measurement principles.

In a study of self-perceived assessment skills of 213 Omani teachers, founded that teaching experience correlated positively with self-perceived assessment skills, and teachers with in-service assessment training showed a higher level of assessment skills than those without in-service assessment training [8]. In a survey of assessment skills of 69 pre-service teachers, founded that the self-described levels of assessment skills remained relatively low for the pre-service teachers across the four years of the teacher education program, thereby suggesting the need for in-service assessment training to ensure an acceptable level of assessment skills [9]. Along similar lines, teachers’ self-perceived confidence in assessment should be a vital component in the professional development of in-service teachers [10].

This article aims to describe the results of research on self-perceived assessment skills of prospective physics teachers by using self-report. Hopefully the result that found in this article can expand other related research.

2. Methods
This study used a descriptive survey research which involved a total of ninety two prospective physics teachers. The respondents are Indonesian prospective physics teachers who experienced teaching practice in junior high school and final project related to assessment. Self-perceived skills of prospective physics teacher has been collected by using Self-Perceived Assessment Prospective Science Teacher Skills Questionnaire that developed and used in the study, consisted of 29 items related seven assessment competencies test. (1) choosing assessment methods appropriate for instructional decisions; (2) developing assessment methods appropriate for instructional decisions; (3) administering, scoring, and interpreting the results of both externally produced and teacher-produced assessment methods; (4) using assessment results when making decisions about individual students, planning instruction, developing curriculum, and improving schools; (5) developing valid student grading procedures; (6) communicating assessment results to students, parents, other lay audiences, and other educators; and (7) recognizing unethical, illegal, and other inappropriate methods and uses of assessment information. The questionnaire using Likert-type scale of five, i.e.: 0 = do not do; 1 = not skilled; 2 = a little skilled; 3 = skilled; and 4 = very skilled. Determination of self-perceived assessment science skills detected from prospective physics teachers was carried out in descriptive statistics, in the form of respondent average values. Based on the average response score of respondents to each statement in the questionnaire, the level of self-perceived skills of prospective physics teachers are then categorized as being five criteria as follows: 0 to 0.80, traditional; 0.81 to 1.60, close to the traditional; 1.61 to 2.40, the transition; 2.41 to 3.20, close to constructivist; and 3.21 to 4.00, constructivist [11].

3. Results and Discussion
The self-perceived assessment skills of prospective physics teachers obtained from their response to Self-Perceived Assessment Prospective Science Teacher Skills Questionnaire (SPAPSTQ). Based on responses to seven competencies of SPAPSTQ, data showing the self-perceived assessment skills of prospective physics teachers can be seen in Table 1.
Table 1. The Self-perceived Assessment Skills of Prospective Physics Teachers

| No | Skills                                                                 | N  | Minimum | Maximum | Average | SD    | Category           |
|----|------------------------------------------------------------------------|----|---------|---------|---------|-------|--------------------|
| 1  | Choosing assessment methods appropriate for instructional decisions   | 92 | 1       | 4       | 2.64    | 0.82  | Close to Constructivist |
| 2  | Developing assessment methods appropriate for instructional decisions  | 92 | 1       | 4       | 2.14    | 1.04  | Transition          |
| 3  | Administering, scoring, and interpreting the results of both externally produced and teacher-produced assessment methods | 92 | 1       | 4       | 2.31    | 0.97  | Transition          |
| 4  | Using assessment results when making decisions about individual students, planning instruction, developing curriculum, and improving schools | 92 | 1       | 4       | 2.54    | 0.93  | Close to Constructivist |
| 5  | Developing valid student grading procedures                           | 92 | 1       | 4       | 2.34    | 1.10  | Transition          |
| 6  | Communicating assessment results to students, parents, other lay audiences, and other educators Recognizing unethical, illegal, and other inappropriate methods and uses of assessment information | 92 | 1       | 4       | 2.14    | 1.17  | Transition          |

Average 1.84 1.01 Transition

Table 1 shows that in general the average of self-perceived assessment skill of prospective physics teachers is transition (1.84/4.00) is still far from the maximum standard. These results indicate that assessment skills of prospective physics teachers change over from a ‘traditional’ skills to a ‘constructivist’ skills. Prospective physics teachers show competence most excellent on standard 1 (M = 2.64/4:00 and the lowest in the standard 2 and standard 6 (M = 2.14/4.00). This result could be explained by the fact that these prospective physics teachers were surveyed after they have taken their assessment course where they were study varied assessment methods and were provided with the experience to choose assessment methods for assess learning target certainly as requirements in assessment course and experience teaching practice. The standard 6 should have been developed by the prospective physics teachers since they had lessons in their assessment course on reporting assessment data and in experience teaching practice. It is possible that skill of reporting assessment data has not maximally given in assessment course. The participants are still prospective teachers, so they have had no hands-on experience in applying the lessons they had for this area of competency. The levels of assessment skills of prospective teachers remained relatively low across the years of the teacher education program [9].

Generally, the results of this study incompatible with the previous finding [5,6] on self-perceive assessment skill of teachers. It possible that teaching experience of prospective physics teachers are limited and correlated positively with self-perceived assessment skills [4] and need for assessment training to ensure an acceptable level of assessment skills [9]. Prospective physics teachers enrolled in a measurement course should be encouraged to base their assessment projects on the instructional activities taking place in their own classrooms [5]. Assessment projects should be integrated with student teaching and other practical experiences. It found also that prospective physics teachers are weak on
standard 2 and 6, thus a need to continue developing the competence of prospective physics teachers in that standard.

4. Conclusion
Self-perceived assessment skills of prospective physics teacher are transition. Of the overall competence, competence choose the method of assessment is the most excellent competencies possessed by prospective physics teachers. While developing assessment methods appropriate for instructional decisions and communicating competency assessment results to students, parents, educators and lay audience are the weakest competence controlled by prospective physics teacher. The achievement of assessment skills of prospective physics teachers’ results of this study should be used as input to the education of prospective teachers of physics in developing the assessment skills in educational programs at the university. Used of self-report surveys and the participating sample might be lack of generalizability of the results in this study. Multiple methods of data collection including classroom observation, analysis of prospective teachers made tests, teachers’ grade books, and teacher interviews to validate teacher self-reports should use in future studies. The survey should be sent to a more representative sample selected from a variety of prospective physics teachers across university in Indonesia.

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