



## Gauging the assessment literacy of Malaysia's home economics teachers: An empirical study

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### Abstract

In the effort to develop a world class educational system for Malaysia, the knowledge and skill in classroom assessment has to be upgraded to allow teachers to carry out a more effective teaching and learning process. Thus, the objectives of this study were to measure the level of assessment literacy based on the Standard for Teachers' Competence in Educational Assessment of Students (AFT, NCME, NEA, 1990) and also to identify differences in assessment literacy based on teachers' experience practising competency-based assessment. The instrument used to measure Teacher's Assessment Literacy consisted of 41 multiple choice items with the reliability index ( $KR_{20}$ ) = .73. Primary data were gathered from questionnaires completed and returned by 187 home economic teachers teaching Vocational Subjects in Malaysian secondary schools. The result of One-Way ANOVA test indicated that there was a significant difference between teachers' assessment literacy and their experience of practising competency-based assessment ( $F(2,184) = 3.46, p < .05$ ). The findings reflected that Home Economics teachers in Malaysia's secondary schools had an average level of assessment literacy. Therefore, there is an urgent need for continuous professional development courses involving classroom assessment for Home Economics teachers to improve their practices, in particular, competency-based assessment.

**Keywords:** assessment literacy, competency-based assessment, educational assessment, home economics, school based assessment, standard for teacher competence

### Introduction

A programme by the name of Vocational Subjects was introduced in the Malaysian secondary schools starting 2002. There are a total of 22 subjects being clustered into six major areas, where one of which is Home Economic. The teaching and learning approach of these courses mainly competency based where, 80% practical work and 20% is based on theory. The changes in assessment system are needed to full fill the teaching and procedure. According to Prodromou (1995) the backwash effect happens when what is being thought influences how it is assessed. Bartman, Bastiaens, Kirscher & Vleute (2006) stated that assessment, learning and instruction should be aligned with each other. Therefore competency-based assessment is used to evaluate students in these subjects.

There are two types of assessment for the Vocational Subjects. The first type is centralized examination which is administered by the Malaysian Examination Syndicate. The other of assessment is competency-based assessment which is conducted by the teachers at the secondary schools. Hager and Ganozi (1994) defined competency-based assessment as the assessment of person's competence against prescribed standard of performance. Student's achievements are measured against identified standard of achievement rather than being ranked against each other. The quality of achievement does not depend on how well others in the cohort have performed, but on how well the individual student has performed as measured against the reference criteria (Dunn, Parry, & Morgan, 2002). Due to this, teachers have to use

his or her professional judgement in assessing and determining whether the students have reached a certain level of competence.

Competency-based assessment has aroused numerous concerns and objections from many quarters (Hager & Ganozi, 1994). Jones (1999) stated that teachers working with competency-based assessment often expressed lack of confidence in their own ability to judge whether or not a student is competent. In competency based assessment, teachers need to have two types of expertise. They need to have considerable expertise in their industrial field and they also require knowledge of vocational education and assessment technique in order to have confidence and competence to make assessment judgement.

Researches have shown that knowledge of assessment can influence teachers' assessment practices. Research done by Vitali (1994) found that teachers' knowledge of assessment can influence their practises in classroom assessment. This statement is supported by Popham (2006) and Stiggins (1995) that strong knowledge of fundamental educational assessment is basic requirement for effective classroom practices. In the Malaysian context, teacher education programme requires the completion of at least one course in educational assessment to get a diploma or a degree in the field. However, many teachers do not feel adequately prepared to assess their students' performance (Mertler, 2009; Daniel & King, 1998). There have been findings to confirm that teachers were not adequately trained in assessment (Gulikson, 1984) and the curriculum in assessment training did not meet the needs of classroom assessment (Schafer & Lissit, 1987). Therefore, this paper discusses the findings on research related to knowledge of assessment in relation to competency based assessment.

## Assessment literacy

Teachers' knowledge in assessment has been called as assessment literacy (Plake, 1993; Campbell, Murphy & Holt, 2002; Mertler, 2005 & 2009). Assessment literacy is defined as knowing what it is being assessed, why it is assessed, how best to assess it, how to make a representative sample of the assessment, what problem can occur within the assessment process, and how to prevent them from occurring (Stiggins, 1995). There has been a major joint effort to emphasize on teachers' assessment literacy by the American Federation of Teachers, the National Council on Measurement in Education, and the National Education Association developed seven *Standard for Teacher Competence in Educational Assessment of Students* (AFT, NCME, & NEA, 1990). These standards are used to guide what teachers should know and be able to do with respect to classroom assessment (Mertler, 2009). The standards consist of the following seven principles. Teachers should be skilled in:

Standard 1: Choosing assessment methods appropriate for instructional decisions.

Standard 2: Developing assessment methods appropriate for instructional decisions.

Standard 3: Administering, scoring and interpreting the result both externally produced and teacher produced assessment methods.

Standard 4: Using assessment result when making decisions about individual students, planning teaching, developing curriculum and school improvement.

Standard 5: Developing valid pupil grading procedures that used pupil assessment.

Standard 6: Communicating assessment result to students, parent, other lay audience and other educators.

Standard 7: Recognizing unethical, illegal and otherwise inappropriate assessment methods and uses of assessment information.

In 1991, the first study related to assessment literacy was undertaken by Plake (1993). The study referred to *Standard for Teacher Competence in Educational Assessment of Students* (AFT, NCME, & NEA, 1990) for the development survey instrument called (the *Teacher Assessment Literacy Questionnaire*). This instrument consists a total of 35 items where each standard is represented by five items.. All items are in multiple choice formats with four answers and one correct answer. This study was administered to 555 teachers. The KR<sub>20</sub> reliability for the entire test was .54. Result showed that teacher

answered an average 23 (66%) out of 35 items correct. The result also showed that the score of an experienced teacher was higher compared to less experience in teachers. The teachers' highest performance occurred on Standard 3 and the lowest performance on Standard 6. These findings showed that majority teachers were found to have some knowledge on administering assessment but less knowledge communicating result to others.

Campbell, Murphy, & Holt (2002) conducted a similar study to 220 undergraduate pre-service teachers following a course in test and measurement. The data showed that a higher level of reliability  $KR_{20}$  .74 compared to Plake's (1993) study but the min score was two fewer questions answered correctly than did respondents in Plake study 21 (60%) out of 35 items. The pre-service teacher scored highest on Standard 1 and scored lowest on Standard 6. These findings imply that the course in test and measurement training have positive impact on teachers' skill and knowledge in choosing appropriate assessment method for instructional decision.

Mertler (2005) studied assessment literacy using the same instrument developed by Plake (1993) and administered it to pre-service and in-service teachers. The findings showed that the average score for in-service teachers was 22 (62.8%) items answered correctly whereas pre-service teachers answered 19 (54.3%) items answered correctly. These findings were similar to the results obtained by Plake (1993) and Campbell et al. (2002). The comparisons between two groups of teachers revealed significant difference in assessment literacy. In-service teachers' assessment literacy was higher than the pre-service teachers although they had just completed a course in classroom assessment. These findings shows that in-service teacher get more knowledge and skill in assessment through classroom teaching experience.

Campbell and Mertler (2005) revised the *Teacher Assessment Literacy Questionnaire* and developed a new instrument called *Assessment Literacy Inventory (ALI)*. These studies examined the assessment literacy of pre-service teachers. The data revealed an overall instrument reliability  $KR_{20}$  of .74 which is higher than the *Teacher Assessment Literacy Questionnaire*. This shows that *ALI* provides a mechanism for educators to measure assessment literacy.

Alkharusi, Kazem & A-Musawai (2011) examined assessment knowledge of in-service and pre-service teachers. The study also examined differences of in-service teaching experience on assessment knowledge. The instrument used in the study was the *Teacher Assessment Literacy Inventory* developed by Plake (1993). The instrument was administered to 279 pre-service teachers and 233 in-service teachers. Independent sample *t*-test was employed to investigate assessment literacy differences between in-service and pre-service teachers. The result revealed that in-service teacher had an average lower level of educational measurement knowledge compared to pre-service teachers. With respect to teaching experience, there is significant difference between in-service teachers with more than seven years of teaching experience and those with less than seven years of teaching on assessment knowledge. In-service teachers with less than seven years of teaching experience demonstrated a higher level of assessment knowledge than the highly experienced in-service teachers. The findings of this study contradict with the finding of Chen (2005). Chen (2005) revealed that teachers with some teaching experience ranging 1 to 5 years had significantly better assessment literacy than those with no teaching experience.

Many studies regarding teacher's assessment literacy revealed that teacher lack knowledge in assessment as identified in the literature. An adequate knowledge of assessment may compromise a teacher's opinion of the practicality and cost involved with adopting new assessment (Vitali, 1994). In Malaysia context, teachers were exposed to only one assessment course with three credits throughout their teaching training programme. Therefore, there is a need to explore teachers' assessment literacy among Malaysian Home Economic teachers. Therefore this paper aims to explore teachers' level on assessment literacy and do teachers' experiences practicing competency-based assessments have difference in assessment literacy.

## Purpose of study

This paper aims to explore the level of teacher's assessment literacy. Specifically, it aimed to answer the following questions:

- 1) What is the level of assessment literacy for home economic secondary school teachers?
- 2) Is there a difference in the assessment literacy between teachers with (high or low) experience in practising competency-based assessment?

## Methodology

### *Research design*

The design for this study was descriptive analysis. This design was selected because it is able to describe the issues and problems in a variety of perspectives, especially those involving attitudes, opinions, beliefs, feelings, behaviours and perceptions (Cresswell, 2005; Chua, 2006).

### *Population*

The population of the study involved home economic teachers teaching Vocational Subjects in Malaysian secondary schools. The teachers were defined as teachers who were teaching Vocational Subject in uppersecondary level in the fields of Fashion Design; Catering; Food Processing; Facial and Hair Care; Childcare and Early Childhood Education. Based on the information provided by the Ministry of Education there are 330 teachers teaching these vocational subjects.

### *Sample*

For the pilot study, a sample size of 32 teachers was selected. The sample size was determined using Cochran formula (1977) in Bartlett, Kotrlík dan Higgins (2001). A minimum number of sample size of 168 teachers was calculated. The researcher has increased the sample size to 200 taking into consideration that the data collection procedure is using mail survey. The sampling procedure used in this study is simple random sampling. An Excel program was used to generate and assign a random number to each sample in the sampling frame to select the sample members. The use of such a single stage simple random sampling method assured that each individual in the population had the same probability of being selected.

### *Instrumentation*

The teachers were surveyed using instrument titled *Teacher Assessment Literacy*. This inventory is based on *Standards for Teacher Competence in Educational Assessment of Students* (AFT, NCME, NEA, 1990). The inventory was adapted from *Teacher Assessment Literacy Questionnaire* (Plake, Impara, & Fager 1993); *Assessment Literacy Inventory* (Campbell & Mertler, 2005) and referred to the text book about educational evaluation, measurement and assessment (Bhasah Abu Bakar 2003; Gronlund 1998; McMillan 1997; Kubiszyn, & Borich, 1996). The researcher developed items that are relevant with the culture and teachers' assessment practices in the Malaysian education system. The inventory consists of 41 multiple choice items with four optional answers and one correct answer. Standard psychometric procedure such as validation and reliability were conducted to avoid regional bias. The reliability index for Teacher Assessment Literacy is  $(KR_{20}) = .73$ . Table 1 provides the information regarding number of items for each standard.

**Table 1. Standard and number of items of *Teacher Assessment Literacy***

Standard	Number of items
1. Choosing assessment methods appropriate for instructional decisions.	5
2. Developing assessment methods appropriate for instructional decisions.	6
3. Administering, scoring and interpreting the result both externally produced and teacher produced assessment methods.	7
4. Using assessment result when making decisions about individual students, planning teaching, developing curriculum and school improvement.	7
5. Developing valid pupil grading procedures that used pupil assessment.	7
6. Communicating assessment result to students, parent, other lay audience and other educators.	5
7. Recognizing unethical, illegal and otherwise inappropriate assessment methods and uses of assessment information.	4
Grand Total	41

### *Procedure*

The instruments were sent to the respondents using their school address. The instruments were sent with the letter of consent from Ministry of Education. The Senior Assistants of each school were given the authority to hand over the instruments to the respondents. They also were assigned to conduct the data collection procedures. The administration of this instrument is similar to procedure of an examination where the respondents are not allowed to discuss with friends or refer to any sources. Respondent were given one and a half hour to answer in the form provided. The letters of reminder were sent to the Senior Assistant who did not return the completed questionnaire within two weeks. A total of 187 (93.5%) teachers completed and returned the questionnaire responded to the survey.

### **Data analysis and findings**

Descriptive analyses of the overall assessment literacy were conducted and the seven composite score that reflected standard including frequencies percentages, mean and standard deviation. Inferential analyses included a One-Way ANOVA of the of the groups of teachers' experience practising competency-based assessment to teachers' mean score for assessment literacy. All analyses were conducted using SPSS version 18.

#### *Findings of research question 1*

- 1) What is the level of assessment literacy for home economic secondary school teachers as measured by *Teacher Assessment Literacy*?

The data resulting from the 187 respondents demonstrates a reliability of KR<sub>20</sub> .73. On the average respondents answered 22(55%) out of 41 items correctly. To make the data more meaningful the raw score was converted to Z-score to determine the level of overall assessment literacy and the level for each standard. The data revealed that about 54.0% of respondent score on medium level of assessment literacy score and 25.7% respondents score on low level of assessment literacy. Based on the Z-score of each standard, out of the seven standards the highest performance was found for Standard 2-*skilled in Developing assessment methods appropriate for instructional decisions* (46% of the respondent scored high level). The lowest performance was found for Standard 6- *skilled in Communicating assessment result to students, parent, other lay audience and other educators*(47.1% respondent scored low level). The result for the level of overall assessment literacy and each standard are presented in Table 2.

**Table 2. Assessment literacy level of home economic teachers**

Variable	Level	Frequency (n)	Percentage (%)
Overall Score of Assessment Literacy	Low	48	25.7
	Medium	101	54.0
	High	38	20.3
Standard 1	Low	81	43.3
	Medium	69	36.9
	High	37	19.8
Standard 2	Low	42	22.5
	Medium	59	31.6
	High	86	46.0
Standard 3	Low	54	28.9
	Medium	81	43.3
	High	48	25.7
Standard 4	Low	67	35.8
	Medium	58	31.0
	High	62	33.2
Standard 5	Low	74	39.6
	Medium	40	21.4
	High	73	39.0
Standard 6	Low	88	47.1
	Medium	58	31.0
	High	41	21.9
Standard 7	Low	69	36.9
	Medium	54	28.9
	High	64	34.2

*Findings of research question 2*

2) Are there any significant differences in assessment literacy based on teachers' experience practising competency-based assessment?

The differences in assessment literacy of teachers' experience practising competency-based assessment was investigated using One-Way ANOVA. The descriptive analyses show that teachers' experience in practising competency-based assessment ranges from less than one year to nine years. The examination of the result revealed that significant differences existed between groups for the total score of assessment literacy ( $F(2,184)=3.46, p < .05$ ). The group of teachers with experience below 3 years practicing competency-based assessment, scored the highest level of assessment literacy compared to the other group ( $M=24.39, SD=5.23$ ). The results of all One-Way ANOVA are presented in Table 3 and Table 4.

**Table 3. Mean and Standard Deviation of assessment literacy for groups of teachers' experience in practising Competency-Based Assessment**

Group of Experience Practicing Competency-Based Assessment	Assessment Literacy		
	n	Mean	Standard deviation
1-3 years	46	24.39	5.23
3-6 years	96	21.87	5.61
Above 6 years	45	22.11	5.45

**Table 4. Result of One-Way ANOVA Test**

		df	Sum of Squares	Mean Square	F	Sig.
Assessment Literacy	Between Groups	2	208.36	104.183	3.464	.033
	Within Groups	184	5533.90	30.076		
	Total	186	5742.26			

## Discussion

The result of this study indicated that the majority of Home Economic secondary school teachers have moderate to low level of assessment literacy. In this study, even though the instrument used was developed by the researcher, the findings are similar to the previous research investigating in-service teachers' assessment literacy using the original version of the instrument and focusing on the assessment literacy of in-service teacher (Plake, 1993; Vitali, 1994; Mertler, 2003; Mertler & Campbell, 2005; Alkharusi et al., 2011). The overall performance on the 41 items resulted with the average score of 55%. This is lower than the average score of 66% obtained by Plake (1993) & Mertler (2003). The findings on lowest performance is Standard 6 (*skilled in Communicating assessment result to students, parent, other lay audience and other educators*) is also similar to previous studies done by Plake (1993) and Mertler (2003).

The findings imply that Home Economic teachers' literacy on educational assessment is inadequate especially on communicating assessment results to others. Therefore continuous in-service training programs on educational assessment should be taken into consideration to cater to problems of low level of assessment literacy. Although the Home Economics teachers in this study had taken pre-service educational assessment courses, but one course in assessment and measurement is not sufficient to cover everything that secondary school teachers need to know. Mertler (2005) stated that the trend of educational assessment is changing towards a more school-based assessment. The traditional focus of pre-service assessment courses has been more on standardized test. Since Home Economic teachers deal with competency-based assessment therefore the content of pre-service training program on educational assessment should focus more on alternative assessment.

This study also investigated the differences of assessment literacy between groups of teachers' experience practising competency-based assessment. The findings of this study are similar to the previous study done by Alkharusi et al. (2011). The finding showed that the assessment literacy of Home Economic teachers with experience of less than three years practising competency-based assessment has the highest score compared to the score of teachers with more years of teaching. The finding shows that teachers with less than three years practising competency-based assessment are majority also a novice teachers. This means that the assessment course during teacher training programme and short courses provided by Malaysian Examination Syndicate (MES) could have a positive impact on assessment literacy.

To make educational measurement training more relevant to teachers Airasian (1991) recommended that non-traditional assessment topic are more important than traditional topics covered by educational measurement courses. Since the present study supported previous study that communicating assessment result was the most difficult standard to meet, therefore focus on the skills communicating assessment result to the related parties should be given emphasis during teachers' professional development training. The researcher suggests that pre-service training program for home economics should spend more time to equip persevere teachers with the skills to interpret and communicate assessment result effectively. In the Malaysian context interpreting and communicating results are done but only at a superficial level. The findings also reveal that there is a need for these skills to be practiced in depth because each student has their own strengths and weakness but this is seldom identified and communicated to them and their parents. This area of concern should be investigated in future studies.

## Conclusion

This research explored the level of home economic teacher's assessment literacy. The findings showed that majority home economic teachers have moderate to low level of assessment literacy especially in communicating result to others. This research also showed that assessment literacy of Home Economic teachers with experience of less than three years practising competency-based assessment has the highest score compared to teachers with more years of teaching. Therefore, there is an urgent need for continuous professional development courses involving assessment in the classroom for Home Economics teachers to improve their practices in classroom assessment.

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