

## A Structural Equation Modelling Approach in determining the influence of assessment conception on formative assessment practices



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**ABSTRACT:** This study was carried out to determine the influence of assessment conception on formative assessment practices. The study used a quantitative approach and involved 450 respondents from some universities in Malaysia. Data was collected using multistage sampling technique. The questionnaire used in this study has been adapted from previous studies. The data has been analyzed descriptively statistically using the Statistical Package for the Social Sciences (SPSS) version 26 software while the structural process and the suitability test of the structured equation model were carried out using the IBM SPSS AMOS version 24 software. The result of the study shows that the assessment conception of respondents influences their formative assessment practices with a contribution of 35% of the amount of variation explained by the assessment conception. The results of the study could be used as a guidance in optimizing formative assessment implementation by upgrading the conception of assessment of lecturers.

**KEYWORDS:** Formative Assessment Practices, Assessment Conception, structural equation modelling

### INTRODUCTION

Good assessment must be parallel to teaching and student learning. They must also be in touch with the three main domains, namely the cognitive domain, psychomotor domain and affective domain of a student as introduced by Bloom et al. (1956). Therefore, the Malaysian Ministry of Education recommends that formative assessment at the universities is no longer depending solely on the final examination (summative) but also continuous assessment (formative) (MQA, 2014). The Ministry has handed over the responsibility for monitoring the quality of higher education to the Malaysian Eligibility Agency (MQA). The MQA has determined that every university need to be fully accredited need to comply with the guidelines set for teaching and assessment. The assessment exam must consider final results of the course and the program learning. In summary, the implementation of this new assessment must be able to provide optimal learning results, but it requires commitment from lecturers, students and administrators in Malaysian universities (Damit et al., 2021).

Effective formative assessment practices are very important in increasing students' motivation if a robust assessment design is implemented (Swan et al., 2021). In fact, if students receive appropriate and immediate feedback about their learning progress, this can increase their motivation to continue learning (Habibah, 2016). Apart from that, assessment results are also important to teaching staff because they allow teaching staff to measure and assess students' knowledge, proficiency and understanding of the subject. It provides information about what students have learned and helps identify areas where they may need additional support or teaching (Jamil & Said, 2019). The practice of formative assessment involves four basic activities, namely (i) designing assessments to obtain more evidence of learning. (ii) collecting information (iii) interpreting information (iv) responding to information that has been interpreted (Areekkuzhiyil, 2021). The American Teachers Association, the National Council on Measurement in Education, and the National Education Association have developed seven important assessment competencies that teaching staff should possess. This includes skills in designing assessments, skills in selecting assessment methods, skills in administering assessments, skills in making analyzes of assessment results, skills in conveying feedback to interested parties regarding assessments, skills in making applications regarding assessment results and skills in identifying unethical assessments.

Several researchers have developed instruments to study specific formative assessment practices among lecturers (Matovu, 2019), teachers (Gonzales & Fuggan, 2012; Suah et al., 2010; Talib & Abd Ghafar, 2008), and prospective teachers (Suppian & Ahmad, 2016). Matovu (2019) developed an instrument called the Assessment Practices Inventory (API) to assess the assessment practices of lecturers in Uganda. API consists of four dimensions: design, interpretation, application, and administration to assess the

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instructor's skills in carrying out assessments. The study of assessment practices at universities is still relevant because improvements are often made in assessments. Unfortunately, there are lecturers who still do not understand the implementation of results-oriented assessments because their assessment skills are still considered low (Damit et al., 2021; Bakar et al., 2018; Othman et al., 2016). Therefore, it is important to review the basic levels of teacher proficiency in carrying out assessments before they are given the more challenging task of assessing students.

### PROBLEM STATEMENTS

Many studies show that many teaching staffs at the universities in Malaysia still do not understand how to carry out formative assessments based on learning outcomes (Bakar et al., 2018; Othman et al., 2016). The Continuous Quality Improvement (CQI) Process is still not fully implemented, and teaching staffs need more guidance in carrying out assessments because there is no appropriate mechanism to support CQI assessment and assessment (Damit et al., 2021). There is also no shortage of studies abroad regarding the implementation of assessments, especially those involving formative assessments. According to Kitula and Ogoti (2018), the difficulty of carrying out effective formative assessments results in them not being carried out well because lecturers and students do not involve themselves when carrying out assessment tasks, in fact the tasks cannot adequately assess the expected learning outcomes. The assessment results are also not in line with the expected results. Hence, this study aims to investigate the assessment conception of Malaysian lecturers in relation with their practice of formative assessment.

### AIM AND OBJECTIVE OF THE STUDY

The study is conducted to determine the relationship between assessment conception and formative assessment practices among lecturers in Perak. Specifically, it sought to answer the following research objectives:

1. To identify the level of assessment conception;
2. To identify the level of formative assessment practices;
3. To identify whether assessment conception have a significant and positive relationship to formative assessment.

### RESEARCH METHODOLOGY

This study uses a quantitative approach. The instrument used was a questionnaire with a ten-point Likert scale (strongly disagree to agree strongly) distributed to 450 lecturers in Perak.

#### The Instrument

Two instruments were used. The instrument for formative assessment practices is adapted from Hassan et al. (2022). The instrument for assessment conception is adapted from Brown (2006). All the 52 items then went through validity and reliability process. Content validity is checked by the experts in the field from the universities. The result for Cronbach Alpha is shown in Table 1. Values of Cronbach's alpha coefficient ( $\alpha$ ) less than 0.60 are not acceptable, and values between 0.60 to 0.80 are accepted, and values above 0.80 are categorized as good (Sekaran, 2016). Thus, a value of 0.950 and 0.965 indicates that each item in the questionnaire questions has sufficient to be processed with the study.

**Table 1. Overall Cronbach's Alpha values for assessment conception and formative assessment practices construct**

Construct and Sub-constructs	Overall Cronbach's Alpha Value
Formative assessment practices:	0.950
Design	
Administration	
Application	
Interpretation	
Assessment Conception:	0.965
Support	
Irrelevant	
Student Accountability	
University Accountability	

### RESULTS AND DISCUSSION

#### Descriptive statistics

Descriptive statistics are used to study the demographic characteristics of respondents (Leavy, 2017). The results of descriptive statistics for the formative assessment practice show that the minimum average of the obtained sub-constructs is between 7.65 and

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8.22. Meanwhile, the range of standard deviation is between 0.95 to 1.02 where the values are less than  $\pm 2$  (Table 2). Meanwhile, the results of descriptive statistics for the conception sub-construct are between 6.57 to 8.52 where the standard deviation is between 1.06 to 1.99 (Table 3). The standard deviation value is less than  $\pm 2$  represents that each item value is scattered near the mean value and is reliable. In addition, the highest mean mean is the design sub-construct and the lowest is the administrative sub-construct. The study shows that lecturers are confident in implementing assessment design based on the highest average mean among the four sub-constructs of formative assessment practices (Table 2). Meanwhile, for the assessment conception, lecturers show their support for assessment as a learning support tool based on a high average mean for the construct.

**Table 2. Minimum, Maximum and Standard Deviation values for the formative assessment practice**

Subconstruct	Minimum	Maximum	Standard Deviation
Design	3.9	10	0.98
Administration	3.4	10	1.00
Application	3.8	10	0.99
Interpretation	3.6	10	1.07

**Table 3. Minimum, Maximum and Standard Deviation values for the assessment conception**

Subconstruct	Minimum	Maximum	Standard Deviation
Learning Support	3.8	10	0.96
Irrelevant	3.5	10	1.02
Student Accountability	3.7	10	1.01
University Accountability	3.6	10	1.09

After checking for validity for both the measurement model for assessment conception and formative assessment practices, then the researcher proceed with the structural equation modelling. The value of the pooled CFA reaches the value of unidimensionality, fit index, validity, reliability and normality for each construct. When all of the constructs reach the value, then structural equation modelling can be done (Hair et al., 2014). Structural equation modelling can be used to analyze the relationship between constructs built based on theory. The model constructed turned out to meet the assessment criteria of the conformity index shown in Table 4.

**Table 4. Conformity Index of Structural Equation Model for Assessment Conception and Formative Assessment Practices**

Category	Standard Value of Conformity Index	Eligibility Criteria	Model	Comments
Parsimonious fit	Chisq/df	$1.0 \leq \chi^2 / df \leq 5$	2.551	Meet the good level
Incremental fit	CFI	0.90 ke atas	0.967	Meet the good level
	TLI	0.90 or greater	0.955	Meet the good level
Absolute fit	RMSEA	$\leq 0.08$	0.068	Meet the good level

Based on the value of the standardized regression coefficient value in the structural equation model,  $R^2$  is also displayed for this study where  $R^2$  describes the extent to which the independent variable used contributes to the estimation of the dependent variable of the study model (Awang et al., 2018). Assessment conception contributes as much as 35% of the influence on the formative assessment practices of lecturers.

Table 5 shows that conceptual constructs contribute significantly to assessment practices. If  $X$  = Assessment Conception and  $Y$  = Formative Assessment Practice, then the regression equation is  $Y = 0.523X$  where when conception increases by 1 unit, assessment practice increases by 0.523 units. The estimated regression coefficient of 0.523 has a standard error value of 0.089. A standard error value  $< 1.0$  reflects a good estimate. Critical Region ratio (C.R.) for the regression coefficient,  $Z = 0.523/0.089 = 5.906$ . The probability of getting a critical ratio value  $Z = 5.906$  in absolute value 0.001. In other words, the influence of the assessment conception in predicting the formative assessment practice is significant.

**Table 5 Causal Effect Testing for Each Study Construct**

	Estimate	S. E	C. R	P	Result
Formative Ass Practices ←--- Conception	0.567	0.092	5.882	0.001	Significant

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### DISCUSSION

The findings of this study show a high mean value for the assessment conception which that supports student learning. The main purpose in implementing assessment is to improve learning and assessment as told by Black & Wiliam (1998) and Stiggins (2014). Teachers who consider formative assessment to support learning will be fully involved in diagnosing students' performance (Brown, 2004). In addition, the information obtained from the assessment is used to plan teaching and organize learning. This study is concordance with a study by Ndalichako (2015) where 50.9% of 4160 teachers support formative assessment to improve teaching and learning. Studies from Hong Kong and China shows the same result whereby the lecturers used various techniques in assessing including formative and summative to support learning (Azis, 2015 and Remesal, 2009). Lecturers focus more on the process of learning and not the outcome (Middleton, 2017). Brown (2004) states that lecturers identify obstacles faced by their students by increasing the strength within students (Brown, 2004). Teachers are also said to involve students in making decisions while improving student learning (Black & Wiliam, 1998).

There is a study on 12 lecturers looking on their conception of classroom assessment shows that the assessment conception of lecturers is influenced by the evolution of student learning. If students are seen to be able to understand learning well, this will have a positive effect on the conception which shows the implementation of better formative assessment practices. Meanwhile, a study conducted by Elshawa et al., (2017) on 83 instructors teaching English in Malaysia using quantitative methods showed that although the instructors believe that assessment improves student learning, their assessment practices depended on writing tests only. They do not seem to understand the difference between summative and formative assessment. This matter is agreed by Sulaiman et al., (2020) who claim that Malaysian university lecturers have different competencies in carrying out assessment, especially formative assessment.

### CONCLUSION

Overall, the study shows the need for continuous monitoring and evaluation of lecturers' assessment practices. The management needs to provide related mechanisms such as professional learning to monitor and evaluate formative assessment practices to ensure consistency with the desired conception and improve practices that are less effective. In addition, there is also a need to emphasize the development of lecturers' accurate conception of assessment. This will help improve lecturers' assessment practices which will ultimately have a positive impact on student learning. Lecturer' understanding and conception of assessment plays an important role in determining their formative assessment practices. A true and deep assessment conception can foster the use of quality assessment, provide useful feedback, and contribute to the development and improvement of students' learning.

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