Formative Teaching Style Does Not Contribute to Student Academic Achievement - A Cameo Study

By

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Abstract

There is a growing body of literatures that emphasize on the importance of formative assessment to improve the students' performances in both summative assessment and learning motivation. In this practitioner study, the aim is to examine the effect of formative assessment on academic achievement in the context of the Vietnamese college classroom. A quasi-experimental research design is applied, whereby the researcher taught both an experimental and a control class within the same semester. The investigation on the influence of formative assessment intervention is examined by four types of tests, namely pre-test, post-test, mid-term test and semester-end test. The results revealed that the experimental class achieved higher scores in both mid-term test and post-test compared to the control class and there are no differences in the semester-end test (summative assessment) between the two classes. The partially successful investigation within this study revealed the complexity of the current formative assessment practice. The practitioner's attempt to conduct formative assessment for an active learning environment is not effective, because the problems arising from local traditional beliefs and practices of teaching, learning and assessment hindered the long-term growth of the method. Therefore, further support from the educational policy and professional development are required to help the Vietnamese teachers to obtain a profound understanding of the formative assessment theory and practice principles. As a result, these new approaches will lead to a complete success of the formative assessment practice in Vietnamese classroom.

Keywords: *formative assessment, summative assessment, academic achievement*

1. Introduction

Formative assessment was perceived as a good teaching methodology, hence had been encouraged in diversed educational institutions all around the world (Carless, 2012; Frohbieter, Greenwald, Stecher, & Schwartz, 2011; Klenowski, 2009; Pham & Renshaw, 2015). Furthemore, the motivation to shift towards the formative assessment method has been an ongoing process for the past 20 years. After the significant impact of Black and Wiliam's research on highlighting the crucial role of assessment for learning in 1998, the formative assessment method gained significant interest due to its ability of strengthening the relationship between assessment, learning and teaching. Under the universal influence of the formative assessment method in educational reform, many Asian countries have transformed their educational policies. As a result, a greater concentration has been directed towards the student learning process by applying the formative assessment method.

One of the transformation examples took place in 2001, where the Ministry of Education of the Republic of China issued the "Outlines" for reforming their Basic Education Curriculum, whereby underlined the function of formative assessment to improve teaching and concurrently support the learning process (Berry, 2011b; Yin & Buck, 2015). Similarly in the same year, the Hong Kong government introduced School-Based Assessment (SBA) method to implement an assessment system for learning (alternative term for formative assessment) within the local school curriculum. This particular implementation aimed

to balance the applications of formative assessment and summative assessment, which was an approach to emphasize assessment policies to support the student learning process and avoid simple reporting process of their achievements (Berry, 2011a, 2011b). Thereafter, the windmills of 'Holistic Assessment' in Singapore was introduced in 2009, which were conducted by the Primary Education Review and Implementation (PERI) Committee as an approach revise the primary education. The Singaporean system particularly focused on students skill development and constructive feedback to effectively reduce the pressure from high-stakes examinations (Ratnam-Lim, Heng, & Tan, 2015). Apart from Singapore in the ASEAN region, Malaysia followed this global trend in 2011 by an official introduction of SBA and Standard-Based Primary School Curriculum to enhance the quality of student learning with emphases on three measurable domains: cognitive, affective and psychomotor (Talib et al., 2014).

Following these enhanced transformations, the Vietnamese Ministry of Education and Training has recently released the Circulate No.30/2014/TT-BGDĐT on "Promulgating regulations on assessment of primary students" (MOET, 2014). According to this document, during the learning process, teachers do not grade students' tests or homework in the usual process, but only provide feedback to the students on their performance in order to support their learning processes. However, there is no empirical study to date that examines on the effectiveness of the formative assessment towards improving the students' achievement after the implementation. It is important to note that there were problems occurring after the implementation of formative assessment process. Therefore, this investigation aims to address the gap of the implementation success of the formative assessment and the relative impact to students' performance under the context of Vietnamese education.

2. Literature review

Summative assessment is mainly used to judge a student's learning ability through a standardized test, which is typically administered by a third party agency or a teacher via grading process of pass or fail (Danielson, 2008). However, the definition of formative assessment is "encompassing all those activities undertaken by teachers, and/or by their students, which provide information to be used as feedback to modify the teaching and learning activities in which they are engaged" (Black & Wiliam, 1998a, p. 7). The process of formative assessment will be in iterative mode, whereby implemented by both teachers and students in the classroom. In principle, the teachers will collect data related to students' thinking and learning difficulties, followed by providing the relevant feedbacks of the students' performance by interpreting and comparing the learning outcomes (Bell & Cowie, 2001).

Based on the literatures, formative assessment demonstrated the ability of enhancing student achievement and teaching practice; while concurrently reduce the gap towards achievement among students. The meta-analysis study conducted by Black and Wiliam (1998) revealed that frequently and appropriately applied formative assessment will improve students' achievements in external tests and motivations, especially among low achieving students and those with learning difficulties. The impact of formative assessment was surprisingly larger than other educational interventions. In addition, Hattie's synthesis of 500 meta-analyses reported that formative feedback given to students was the most effective factor in classroom teaching methodology (Hattie & Timperley, 2007; Hattie, 1999).

On the other hand, practicing formative assessment was never an easy and straightforward task, because this assessment was characterized as flexible and uncertain (Bell & Cowie, 2001). Furthermore, adopting formative assessment adds delay to the current teaching practice, hence unable to produce a promising result (Black & Wiliam, 1998b). Considering all these negative aspects, implementing formative assessment in an Asian context, more specifically in Vietnam is more demanding for a teacher owing to the conflict between Western educational theory and the local Vietnamese educational environment. There are many challenges experienced by educational actors (students, teachers) and administrators in Asian countries (including Vietnam) in finding an appropriate approach to practice formative assessment. Furthermore, to apply formative assessment in Asia can be time-consuming and challenging for large

classes. Similarly, school administrators do not support teachers to experiment new ideas by applying formative assessment practice, but only encourages good results through applying summative assessment method. Apart from administrators, some teachers do not believe in formative assessment due to its incompatibility with exam-orientated culture, hence the lack of motivation in applying the method into actual practice (Carless, 2012; Kemp & Scaife, 2012; Leong, 2014; Mak & Lee, 2014; Pham & Renshaw, 2015; Talib et al., 2014; Tepsuriwong & Bunsom, 2013; Wan Ka, Kim Wai Raymond, & Kwok On, 2006; Yin & Buck, 2015). Thus, as discussed earlier, it is imperative to conduct an empirical study into formative assessment method, which is specifcally catered for Vietnamese educational environment. Through this detailed investigation, the influence of formative assessment on students' achievement can be unveiled, and the problems experienced by local teachers that apply the method can be further understood.

Convergent and divergent formative assessment

Formative assessment method had been studied for the last two decades, however the fundamental and implementation aspects of the method are still unclear. Accordingly, Wiliam (2013) suggested that formative assessment was defined differently, therefore he generalized that any assessment will be called formative if it was helpful for classroom practice. In the view of Torrance and Pryor (2001), the sociocultural perspective of learning explained that there are two 'ideal-typical' types of formative assessments, namely convergent and divergent. Both types of formative assessments are considered as an intersubjective social process situated in and accomplished by the interaction between students and teachers. *Convergent assessment* process ascertains the know-how of a learner, understands or can perform a predetermined task, where a teacher produces a detailed lesson plan in the form of closed or pseudo-open questioning and learning tasks. In this category, students are assessed from a behavioral perspective, and trained to master the curriculum, and formative assessment will be carried out by teachers to learners. On the other hand, *divergent assessment* focuses on what a learner knows, understands and can accomplish, where in this category teachers produce less detailed lesson plans with more open questions and tasks. Divergent assessment is implemented as part of formative assessment via the constructivist angle, with an intention to teach in the "zone of proximal development". This particular assessment can be carried out by teachers *with* learners.

Convergent formative assessment is adopted in this study as a form of classroom assessment technique (CAT). All the CATs applied in the present study are adopted from the work of Angelo and Cross (1993). A variety of studies had applied these techniques and successfully proved that CATs will improve the student learning and motivation aspects (Cottell & Harwood, 1998; Goldstein, 2007; Philip & Elaine, 1998; Stiggins & Chappuis, 2005).

Objectives of the study

The objective of this study is to reveal the impact of formative assessment on students' achievement during the one–semester course of General Psychology in a Vietnamese college. The following two research questions are examined:
1. Does formative assessment practice improve the student achievement in the Vietnamese college?
2. What kinds of problem do the teacher face while practicing convergent formative assessment method?

3. Method

Participants

The teaching participant has had five-years of teaching experience in General Psychology at the college level. According to the given per semester teaching schedule, the teacher has two classes that are randomly selected, which can be an experimental class and a control class. There are 36 first-year students in the experimental class and 45 students in the control class. However, during the running period of the course, some students in both classes either dropped out or did not complete enough tests

and unable to continue the class. Therefore, the researcher randomly chose 30 students from each of the two classes whom have completed all of the tests, resulting in a total of 60 students (67% females, and 33% males) from a college in Danang City, Vietnam taking part in the study. The ages of the participants ranged from 18 to 20.

Procedure

The structure of the course is 15 weeks with three 50 minutes period per week. In the first week, the two classes completed the pre-test, followed by the mid-term test in week 7, and finally the post-test in week 14. After one month of revision, the students participated in the semester-end test (See Table 1).

Table 1. Study procedure and data collection methods

Time	Week 1	Week 7	Week 14	After one month revision
Data collection	Pre-test	Mid-term test	Post-test	Semester-end test
		Formative assessment intervention		
Experimental class	x			x
Control class	x	x	x	x

Meanwhile, the teacher who implements the formative assessment intervention spends from week 1 to week 14 in the experimental class to embed formative assessment techniques into classroom activities. Upon collecting and interpreting learning information from the students, the teacher may choose to immediately provide oral feedback to the students for corrective action. Alternatively, the teacher may prepare an adjusted lesson plan in the following week for corrective action. The researcher used 14 formative assessment techniques adapted from the study of Angelo and Cross (1993) to enhance the students' performance during the learning process. Formative assessment techniques may be divided into two categories, namely assessing course-related knowledge and skills, and assessing learner attitudes, values, and self-awareness. All techniques are presented in Table 2. There are no formative assessment activities in the control class, therefore the teacher lectured most of the time.

Table 2. Formative assessment techniques that are applied in this study

Technique Category	Technique	Description	Purpose
Techniques for assessing course-related knowledge and skills	1. Minute paper	Quickly assesses student understanding gained from a particular instructional sequence by collecting written answer to questions "What was the most important thing you learned during this class?" or "What important question remains unanswered?"	To check how well learners understand concepts during instruction.
	2. Muddiest point	Assesses conceptual confusion by asking questions such as "what was the muddiest point in ……?"	To identify what students are confusing mostly during instruction
	3. Memory Matrix	Assesses prior knowledge and recall by providing students a two-dimensional matrix consisting only row and column headings	To develop the ability to organize ideas of student memory

4. Focus listing	Assesses prior knowledge, recall by requiring students to list related ideas of a single important term or concept	To discover what learners recall as important points related to a particular topic and helps to center attention on the main concepts
5. Multiple choice questions	Assesses student understanding gained from a given instruction sequence by multiple choice questions	To discover how well learners understand what they have been taught.
6. Defining features matrix	Assesses skills related to analysis and critical thinking by asking them to determine which defining features from a list belong to which concepts.	To discover learners' ability to differentiate between similar concepts and make critical differentiation decisions
7. Think – Pair – Share	Assessing skills related to analysis and critical thinking by providing students time and structure for thinking about a given topic, formulating individual ideas and sharing these ideas with a peer.	To develop conceptual understanding of a topic, develop the ability to analyze information and draw conclusions, and develop the ability to consider other views
8. Concept maps	Assessing skills related to synthesis by requiring students to diagram relationships between a major concept and other learning	To assess students' conceptual understanding including the relationships between key concepts and the degree of "fit" between students'understanding of concept relations and the teacher's concept map.
9. One sentence summary	Assessing skills related to synthesis and creative thinking by requiring students summarize information about a given topic into one long, grammatically-correct summary sentence	To assess how concisely, completely, and creatively students can summarize a large amount of information
10. Short writing	Assesses critical thinking by requiring students to write their short answers to a given problem within a half page.	To assess student ability to express their thinking in writing.
11. Problem recognition tasks	Assesses skills related to synthesis and creative thinking by requiring student identify the type of problem that each example represents	To examine how well students can identify problem types and match problem with possible solution methods
12. Application cards	Assesses skill application and performance by requiring students to	To assess students newly learned concepts with real life application.

		generate a real-world application after learning new concepts, theories or principles	
	13. Student-generated test questions	Assesses skill application and performance by requiring students to write test questions based on the materials they have learned	To discover what students consider most important, what they understand as fair/useful test items, and how well they understand related information
Techniques for assessing learner attitudes, values, self-awareness	14. Profiles of admirable individuals	Assessing students' awareness of their attitudes and values by requiring students to write a brief, focused profile of an individual in a field related to the course whose values, skills, or actions they greatly admire.	To understand the images and values students associate with the best practice and practitioners in the discipline under study

The techniques presented in Table 2 are chosen according to the three contextual factors, namely (1) the content and learning outcomes of each module; (2) levels of time and energy required for the teacher to prepare the techniques, analyze the collected data, and for the students to respond to the assessment, and finally, (3) the teacher's assessment ability. Therefore, depending upon the technique's requirements, the teacher may decide to apply the techniques on an individual, group or whole class basis. However, small groups are preferred to assure that students in the experimental class are following the same learning speed as the control class.

Data collection methods
In this proposed investigation, the data is collected from one source as test scores comprise of pre-test, post-test, mid-term test and semester-end test. All three tests, except for the final test in this proposed investigation are specifically designed for this study. The test formats are customised to help students to demonstrate their knowledge in a simplified manner, and also to reduce the time required for teachers' to mark the test scripts. Firstly, the pre-test has four open-ended questions to evaluate the students' prior knowledge based on the four modules within the subject. The students are then asked to list down what they have already understood on those topics in the following contexts, "Write what you know about…." or "Name some …you know". Secondly, the mid-term test aimed to assess the students' knowledge after completing the first two modules of the course. The structure of the mid-term test has two parts, which consists of ten multiple choice questions and two open-ended questions. After the mid-term test, the lessons will continue for the rest of the two modules. Following the completion of the two modules, the post-test will be held with 30 multiple choice questions to examine the knowledge and skills that the students have obtained.

Finally, the semester-end test is organized, where the students received one of the two question papers labeled with an odd or even number based on their index numbers. These papers are prepared by the Office of Educational Testing and Quality Assurance based on school officers randomly choosing four open-ended-questions aligned with the four modules from a subject's question bank. This method aimed to ensure the objectivity of the official school-based semester exam is achieved with the highest score for all four tests decided as 10.

Data analysis
In the perspective of analysis, the four test scores from the two classes are imported into SPSS 20.0 to

conduct mean and standard deviation computations. Apart from that, to investigate on the differences in students' performance under the influence of the formative assessment intervention, an independent *t- test* is conducted.

3. Results

Quasi-experimental results

Before the formative assessment intervention is conducted, the students' prior knowledge of the subject is in similar state. Therefore, there is no difference in the pre-test stage within the classes (Table 3).

Table 3. Pre-test results in control and experimental classes

	N	Min score	Max score	Mean	SD
Control class	30	0.0	3.6	1.86	0.91
Experimental class	30	1.0	3.6	1.85	0.66

Note: The highest score of pre-test is 10.

There are three tests conducted to examine the effect of formative assessment on students' achievement, namely mid-term test, post-test and semester-end test (an official school-based summative test). The results of both mid-term test and post-test of the experimental class are significantly higher than the scores of control class ($p < 0.05$). In these tests, Cohen's effect sizes are found to between 1.08 and 0.81, where Cohen defines that an effect size of 0.2-0.3 is a small effect, 0.5 as a medium effect, and 0.8 and above as a large effect, therefore the effects in this work are large. However, after a month of revision, the semester-end test scores are the same in both classes (Table 4), which indicates that formative assessment does impact the student learning process, but only lasted for a short time.

Table 4. Mid-term test, post-test, and final test in the control and experimental classes

	Control class	Experimental class			
	N = 30	N = 30			
	M (SD)	M (SD)			Effect
			t	*p*	size *(d)*
Mid-term test	5.80 (1.19)	6.91 (0.93)	-4.01	.000*	1.08
Post-test	4.73 (1.33)	5.62 (0.96)	-2.96	.004*	0.81
Final-test	6.73 (1.18)	6.77 (1.29)	-1.35	.89	

Note: The highest score of each test is 10.

* $p < 0.05$

As a conclusion to the findings of this investigation, formative assessment has short-term effectiveness on the students' performances, and students largely benefited from the method techniques.

4. Discussion

The findings of the proposed investigation through the quasi-experimental analysis demonstrated that students' learning and achievement were improved under the formative assessment technique. However, this positive result was not reliable througout the investigation. Black (2015) described the current realities of many formative assessment studies at global scale in the following description, "…they are far from presenting a tale of overall success – the most optimistic claim amongst them is of 'partial success' " (p.161). This investigation had actually looked into some problems known to be critical elements of formative assessment method that might had been foreseen or predicted in former studies (De Lisle, 2014; DeLuca, Klinger, Pyper, & Woods, 2014; Flórez Petour, 2014). As a solution, three formative assessment problems require careful consideration in this investigation, namely student learning, teaching practice, and the relationship between formative assessment and summative assessment.

Student learning

During the teaching session in the class, the researcher observed that students were interested to engage in various formative assessment strategies. It seemed that the students were more curious and joyful with these new activities compared to traditional classes where the students underwent passive learning environment. In addition, psychological studies had proved the ability of positive emotions that improved learners' memory at multilevels (Adelman & Estes, 2013; Talarico, Berntsen, & Rubin, 2009; Yegiyan & Yonelinas, 2011). This may explain why formative assessment intervention had a significant impact on the two short-term tests (mid-term test and post-test), which were principally structured in multiple choice questions, hence a good memory would be an advantage.

However, formative assessment method can be unstable, and it was found that the stability depends on the students' motivation to learn. During the formative assessment intervention, the students may not provide enough effort for the subject due to being a minor subject in the curriculum. This was the answer for the findings on the similar state of outcome for summative test between the experimental class and the control class. Asian countries (Vietnam included) had an examination-orientated culture, where secondary students spend most of their time studying the core subjects, which are part of the national public exams to gain entry for the higher educational institutes (Yin & Buck, 2015). In a study that investigated the motivations of 320 Vietnamese students toward learning general subjects in a public university, Nguyen (2010) reported that 52% of the students skipped more than four classes in each course, while 63% of the students revised right before the exams or seminars. In a class-based observation, only 65% of the students actually listened to a lecture, observed the powerpoint slides, and took notes, while the remaining students were engaged in private studies or having a conversation with each other. Therefore, it is likely that formative assessment practice in the Vietnamese college classroom requires greater focus on the traditional learning methods of the students.

Teaching practice

The problem of teaching practice in this investigation of formative assessment is lack of concentration on improving student learning. Implementing 14 techniques within one course seemed to be a heavy workload for the teacher preparing the lesson plans and completing the whole syllabus on time. As a result, the time for interpreting students' learning evidence and altering instructional plans is unmanageable. Ruiz-Primo et.al, (2010) stated that "...teachers could get students to share their ideas, but did not take action on that information to adjust their instruction. Clearly, adjusting instruction or taking action is easier to recommend than to do" (p.154). That means the teaching practice just counted on the quantity of formative assessment techniques and neglected the quality of them, which opposed the statement is that instructional adjustments are essential for effective formative assessment implementation (Wiliam, 2009).

This particular fact seems consistent with the previous studies on implementing diverse educational innovations in Vietnam. One of the best examples was when Japanese experts introduced a child-centered approach to school–based in-service training, Vietnamese teachers showed strong interest in the methodology aspects, but lacked the focus on student learning evidence (Saito & Tsukui, 2008). Furthermore, according to Thanh (2011), the main objective of Vietnamese teachers who used group work was to change the learning atmosphere. Although these efforts were student-centered teaching approaches, the actual practices of local teachers were still teaching-centered.

Formative assessment and summative assessment

Most of the selected formative assessment techniques in this study focused on assessing knowledge and skills related to the course. These assessment techniques helped the teacher to explore what students had learned after each module to enable the alteration of the later instructions. This particular methodology is similar to the practice applied in the research work conducted by Yin and Buck (2015) on formative assessment in China. These authors used six written formative assessment tasks to cater the class

difficulties arising from time-constraint and teacher's inability to use questions in class efficiently. However, the approach by Yin and Buck (2015) were criticised by Chen (2015), who believed that students were not given the opportunity in managing and using the information obtained from the six tasks. According to Chen (2015), independent learner should take the responsibility to learn, because self-efficacy and self-direction were the main goals of practicing formative assessment (Cizek, 2010; Ruiz-Primo & Li, 2013). Contrarily, the findings through extended-response questions and group discussions in this proposed study mainly focused on triggering the students' cognition processes. Although the students received the teacher's feedback as a guide to future learning, the students were not passive learners but actively created goals and plans for their future learning based on the obtained information. For a successful implementation of formative assessment technique, the implementation of *convergent formative assessment is required*, which was suggested by Torrance and Pryor (2001), and concurrently the *divergent assessment* is required as well. The combined *convergent* and *divergent assessment* techniques would allow the teacher to utilize open lesson plans and questions to activate the students' autonomy.

In this study, the teacher had responsibility for the school-based summative assessment, without any pressure from an external examination. However, the summative assessment was extracted from the open-ended question bank that had been used for the last two years, therefore not geared towards the implementation of formative assessment. The questions mostly assessed the ability of students to recall learned knowledge, while formative assessment techniques were aimed at improving students' intellectual capability. As a result, the summative assessment method could not be upgraded to accommodate the requirements of the formative assessment method. The incompatibility was a major problem for many studies that covered the formative assessment method, as reported by Black (2015). If the summative assessment was determined by external agencies, then teachers had to "teach for the test". Instead, if the summative assessment was school-based, teachers would have lacked the skills and confidence to compose individual assessments. As a solution, Black (2015) suggested that teachers need to engage in a continuous professional development program to be equipped with formative assessment knowledge and skills, and to concurrently obtain mutual support, sufficient time for adaptation, reflection and flexibility. These were all the important criteria to enable the facilitation of formative assessment through self-exploration for gradual change. Thus, teacher training to improve the quality and capacity on implementing the formative assessment method is the most important agenda for the Vietnamese government to succeed in this approach.

Limitations
This study was limited by the fact that the main researcher was also a practitioner, the research outcomes might be highly subjective and biased during the interpretation and reporting of the data. In future research, one or more group of practitioners should participate in studies similar to the proposed study, and observe the classes of all the practitioners to arrive at a more objective-orientated outcome. Apart from that, triangulated data should be collected to enhance the reliability and validity of the future studies.

4. Conclusion

This paper attempted to examine the efficacy of formative assessment method towards improving the student achievement in the Vietnamese context. It had been found that the formative assessment practice in the Vietnamese classroom was a 'partial success', which was similar to the rest of the findings on the formative assessment method. The two short-term tests scored higher in the experimental class, however the final test record resulted in similar scores between the experimental and the control classes. The problems associated with the traditional beliefs and the previous practices of teaching, learning and assessment are likely to impede the long-term utilization of formative assessment practice, unless there is a willingness to adapt on the implementation for the local context. In summary, to achieve the complete success in implementing the formative assessment method in Vietnam, future studies and educational

policies should concentrate more on the trainings for teachers, of whom play the vital role in transforming the educational quality through formative assessment techniques.

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