

Assessment: A help or Hindrance to Educational Purposes

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Abstract

The purpose of the study is to analyze two basic types of assessment, 'summative assessment' and 'formative assessment' in order to find out which one is a more student-friendly assessment methodology. Eleven-point likert scale surveys were created in order to discover students' tendencies towards either summative assessment or formative assessment. Semi-structured interviews were conducted to measure the reliability of the data gained through the surveys. 106 students were exposed to summative and formative assessments and their performances were recorded for a semester. The findings have revealed that students show different reactions to different types of assessments. It is clear that there is a big difference between the means of the items in formative assessment survey and those of summative assessment survey. Difference of preferences between summative and formative assessments are statistically significant, $F(35, 70) = 1.877, p < .05$. This finding indicates that students prefer formative assessment to summative assessment and find it more beneficial to academically improve themselves.

Key words: Summative assessment, formative assessment, student performance, academic achievement, assessment methodology

Assessment is a controversial phenomenon that permeates the minds of all stakeholders (e.g. learners, teachers, parents, administrators, politicians, etc.), if not all educational processes, in education sector. In accordance with the roles and goals given to assessment, it can either facilitate learning and teaching (i.e. assessment for learning) and become an effective tool to improve quality of education by supporting learning and underpinning rather than undermining student confidence, achievement and progress or it can be used to measure (i.e. assessment of learning) only how much learners have achieved to make a judgment on their passing or failing (Shepard, 2000; Torrance, 2007). Therefore, loading a particular role on assessment in an institution decides the goal of assessment that shapes the structure of education from planning to delivering and to decision making.

Despite its central role and importance in education, due to the "scarcity of studies" (Stasz, Hayward, Oh & Wright, 2004; Torrance & Coultas, 2004), assessment lacks "commonality in the definition of the terminology" pertinent to it (Taras, 2005). This study is an effort to contribute to the debate on different classifications and applications of assessment and how it should be used to facilitate teaching and learning processes through a study. A survey was created to discover if there is any correlation between students' tendency towards a specific type of assessment (i.e., mainly summative or formative) and their academic performance according to exposure to varying types of assessment.

Assessment is a continues systematic collection, review, interpretation, and use of information about students' achievements and educational programs for the purpose of improving students' learning and development (Brown & Hirschfeld, 2008; Marchese, 1998; Palomba & Banta, 1999). It is carried out to help students to understand their strengths as well as weaknesses. Thus, they have opportunities to learn and develop themselves better. A test is special form of assessment. All tests are assessments, but not all assessments are tests. A test or assessment yields information relative to an objective or goal. In that sense, we test or assess to determine whether or not an objective or goal has been obtained (Kizlik, 2011).

As Saliu argues (2005) that 'assessment is an important aspect of teaching and learning activities that has a substantial impact on students learning' (p. 271). Assessment is not a single process with an easy-to-use procedure. It is comprised of a number of characteristics.

Scriven (1967) defines these characteristics (as cited in Taras, 2005) as “(a) the data-gathering instruments or criteria, (b) the weightings and (c) the selection of goals” (p. 40). Unless each of the aspects of assessment is meticulously scrutinized and justified, assessment might mislead and does not provide desired results.

Assessment is carried out for a variety of purposes. “Assessment provides faculty members, administrators, trustees, and others with evidence, numerical or otherwise, from which they can develop useful information about their students, institutions, programs, and courses and also about themselves” (Gardiner, 2012). This information is used “as a tool to raise standards; to ascertain individual students’ progress; to judge individual teacher performance; to ascertain where intervention in a school was necessary; and to hold schools accountable” (Stobart, 1991).

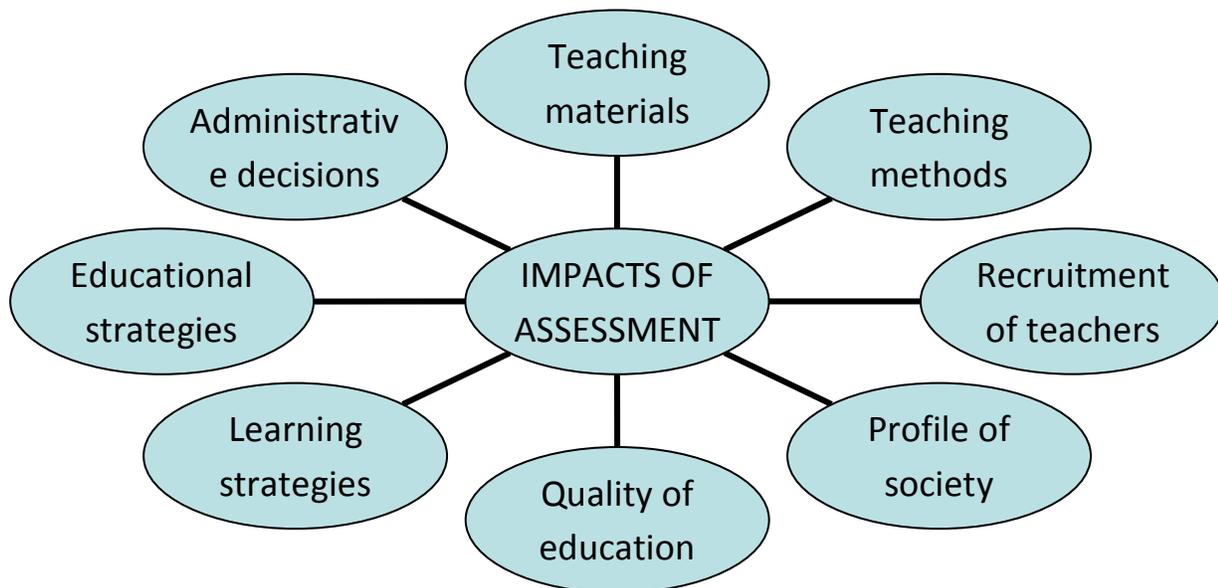
As the function of assessment changes, the intended use of purpose changes as well. Palomba & Banta (1999) argue that “overriding purpose of assessment is to understand how educational programs are working and to determine whether they are contributing to student growth and development. Hence, the ultimate emphasis of assessment is on programs rather than on individual students” (p. 5). According to Brown, Kennedy, Fok, Chan, & Yu (2009), besides “improved learning outcomes for students”, assessment is a tool that provides “a robust basis for certifying student learning.” Palomba & Banta (1999) put the emphasis on “student outcomes” assessment that gives priority to “student learning and development as opposed to faculty evaluation or comprehensive program review” (p. 4). Terenzini (1989) claims that focus must be on assessing students’ development rather than outcomes. Because assessing outcomes indicates the end of process, but assessing progress suggests that the process is still going on and there are opportunities to enhance.

There is enough evidence that the choice of function influences the parameters of the assessment. By virtue of that, the goals, standards, and criteria will be changed, which affects planning, administering, and assessing education either positively or negatively. Although we would expect the educational functions to predominate, often it is the social needs which come to the fore (Broadfoot, 1996; Filer, 2000; Taras, 2005). Roles and goals of assessment are two different components of assessment. Scriven (1967) argues that “failure to make this rather obvious distinction between the roles and goals of evaluation is one of the factors that has led to the dilution of the process of evaluation. This dilution sacrificed goals to roles” (Scriven, 1967, p. 41). For the sake of quality learning and teaching, “we wish to prioritize educational goals over social roles of assessment” (Taras, 2005).

Significance of Assessment

Ability to engage in high-quality assessment has become a sine qua non” (Gardiner, 2012) in order to yield efficient and quality education. This ability is essential for assessors to be particularly good at ensuring that exam assessment is valid, reliable, and transparent (Race & Brown, 1998). Because there is evidence that students’ conceptions have an impact on their educational experiences and learning (Brown & Hirschfeld, 2008; Ramsden, 1997). Therefore, “Assessment should be integral to curriculum development and must have a major role in the regulation of teaching and learning” (Fernandes, 2009).

A close look at the impact factor of assessment reveals that it concerns with a wide range of processes from students’ achievement to instructional strategies, from administrative decisions to selection of teaching personnel, from selecting teaching materials to the nature of learning and teaching setting, etc.

Table 1. Impacts of assessment on educational processes

Summative and Formative Assessments

Assessment is designed to serve formative and summative evaluations of learning; the former occurring during the process of learning and the latter at its end (Brown et al., 2009). This distinction between summative assessment (SA) and formative assessment (FA) was first made by Scriven (1967). Even though they have their own merits, “the balance between formative and summative assessments seems to be difficult to achieve” (Fernandes, 2007). Taras (2005) states that:

Scriven gave us a very powerful tool with the distinction of SA and FA-he permitted us to add the dimension of assessment for learning. He did not wish to create a dichotomy, and clearly indicates that the dimension of FA can only be in addition to SA for assessment (p. 476).

It is obvious that this distinction was not suggested to create a debate, tension, or misunderstanding but when today’s applications of SA and FA are examined, a substantial amount of confusion is discerned. There are both advocates and opponents of SA and FA. Opponents of SA makes a claim that it is negative and destructive side affect of assessment which devalues personal worth and future prospect, and which has instigated many educationalist to see summative assessment in a negative light and promote formative assessment (Black *et al.*, 2004; Torrance & Pryor, 2001).

Black, Harrison, Hodgen, Marshall & Serret (2010) argues that any effort to understand and then improve the tensions between formative and summative assessments should start with an attempt to explore and develop the quality of teachers’ summative assessments. Because SA has become synonymous with tests which are the most used form of assessment as they can be designed to be quite similar to the compulsory exams; this seems to mean that the backwash effect of examinations exerts a strong influence on the day to day running of school (Fernandes, 2005). In a study done by Black et al. (2010), One of the teacher participated in the study said that:

We are caught in a trap. (We have to) report to parents a level. Students focus on just doing tests so we have a level to report. We have missed the point of what we are trying to achieve. It is less and less with monitoring progress and more about filling in boxes.

In order to escape negative effects of SA, many hold on to FA. As Wiliam (2000) says, this is the most detrimental aspect that FA is seen as a magic formula which is not only separate and distinct from SA, but incompatible with it. This is the perceived tension between SA and FA. William wishes to save FA from SA:

...we must refuse to accept the incompatibility of SA and FA. Instead we must find ways of mitigating the tension, by whatever means we can. Of course, this is a vast undertaking, and well beyond the scope of this or any other single paper (p. 16).

Rather than rejecting one and accepting another, it would be more beneficial to find a way to fully appreciate both as Taras (2005) suggests:

We accept that in any educational process, assessment requires both SA and FA. By recognizing that SA is central and necessary to all assessment, it should stop the demonization of assessment for validation and certification, and instead see it as a stepping stone to learning. This would be true particularly if FA can be seen as a necessary step which justifies and explains SA (p. 476).

Summative assessment

Summative assessments are those assessments designed to determine a students' academic development after a set unit of material (i.e., assessment of learning) (Stiggins, 2002). Summative assessment is used to inform parents, pupils and other agents about pupils' achievements at certain moments of the academic year as well as to certify pupils' knowledge and competencies (Fernandes, 2009). Taras (2005) sees SA as finality at the point of judgment. He also claims that SA do not impinge on the process of education where real learning takes place. Summative tests should be, and should be seen to be, a positive part of the learning process. Such tests should be used to chart learning occasionally rather than to dominate the assessment picture for both teachers and students (Black et al., 2010).

In accordance with the definitions above, Summative assessment as assessment of learning, cannot promise much about the progressive aspect of education. On the contrary, tests dominate practice throughout the school years impose negative effects on students' learning (Harlen, & Deakin-Crick 2002). Research provides support for some of the claims about the negative impacts of standardized testing (most common form of SA). For example, in a survey of nearly 1,000 students in elementary school through high school, Paris, Lawton, Turner, and Roth (1991) asked students about standardized tests. As they get older, students feel "greater resentment, anxiety, cynicism, and mistrust of standardized achievement tests" (p. 16). Paris et al. reported a decrease in motivation to perform well on standardized achievement tests as students get older.

Stefanou & Parked (2003) lists a number of unintended, negative consequences as a result of an increasing overreliance on standardized assessments. Included among these adverse consequences are;

- (a) large portions of instructional time devoted to preparing students to take the standardized tests;
- (b) narrowing of the curriculum to include only that which is assessed by the tests;
- (c) fragmentation of the curriculum, leading to an inert knowledge base for the students;
- (d) evolution of instructional practices, including teacher-made tests, to mimic the types of learning skills that dominate standardized tests; and
- (e) truncation of students' learning strategies, resulting in the use of primary lower order learning skills (p. 152).

The Children, Schools and Families Committee in May 2008 in England published a report on national testing that stated that: 'national testing for school accountability has resulted in some schools emphasizing the maximization of test results at the expense of a more rounded education for their pupils' (House of Commons Children, Schools and Families Committee, 2008). It claimed that teaching to the tests was widespread, narrowing teaching to English, mathematics and science and in particular those aspects that are tested, a fact that compromised teachers' creativity and children's access to a broad and balanced curriculum.

It is natural that summative assessments at the end of learning (e.g., examinations) do not provide rich feedback capable of improving learning outcomes for the students being assessed (Scriven, 1991). However, "using summative assessment for formative purposes can create efficient learning outcome" (Black et al., 2004, p. 56). Although instructors may use the examination results to form or shape instruction for subsequent groups of students, feedback must occur during the learning process. It is to be formative for the learners being taught or prepared for the final summative assessment (Scriven 1991).

Formative assessment

Main concern of FA is to monitor student progress during the learning process (i.e., assessment for learning) (Chappuis & Stiggins, 2002). Formative assessment is a key process in the development of educational success (Fernandes, 2009). Formative assessment, often called assessment for learning, is characterized by its primary purpose-promoting learning. It informs the teacher about appropriate next steps for instruction, and engages students in thinking about their own ideas (Dunn & Mulvenon, 2009; Keeley, 2012). It is used by teachers to support instruction and learning (NRC, 2001). Hence, it takes place during instruction to provide feedback for the adjustment of ongoing teaching and learning for the purposes of improving student achievement related to instructional objectives (Melmer, Burmaster, & James, 2008; Sadler, 1989).

For an assessment to be formative, it requires feedback which indicates the existence of a 'gap' between the actual level of the work being assessed and the required standard. It also requires an indication of how the work can be improved to reach the required standard (Ramaprasad, 1983; Taras, 2005). Students want honest, comprehensible, and constructive feedback on how to improve, (Pajares and Graham, 1998). Feedback requires knowledge of the standard or goal, skills in making multi-criterion comparisons, and the development of ways and means for reducing the discrepancy between that is produced and what is aimed for (Sadler, 1989, P. 142)

The form of an assessment creates the conditions for the type and quality of instructional practices engaged in by educators and learning strategies and behaviors exhibited by students. The arguments offered to demonstrate the advantages of performance assessments over more traditional assessments are that performance assessments (a) are more authentic assessments; (b) use context, (c) encourage higher order thinking rather than memorization and recall; (d) are more engaging and therefore more motivating for the students; and (e) are more valid assessments, specifically more systemically valid (Frederiksen & Collins, 1989).

Dunn & Mulvenon (2009) argues that a review of the literature revealed limited empirical evidence demonstrating that the use of formative assessments in the classroom directly resulted in marked changes in educational outcomes. However, Torrance (2007) argues that claims for the educational value and effectiveness of formative assessment in the mainstream compulsory school system have been made for a number of years. Formative assessment, when adequately used, contributes to a significant improvement in a pupil's understanding and learning. Research also suggests that pupils with learning difficulties are those who most benefit from formative assessment practices (Black & Wiliam, 2006). When students are exposed to FA, they see themselves as beneficiaries rather than victims of testing, because FA can help them improve their learning. The achievement of this ideal was expressed by a teacher in a formative assessment project done by Black et al. (2010), describing the new attitude of her students:

They feel that the pressure to succeed in tests is being replaced by the need to understand the work that has been covered and the test is just an assessment along the way of what needs more work and what seems to be fine.

Lee (1994) and Parkes (2000) found similar evidence on performance assessments that college students have a tendency to use different study strategies depending on the format of the test to be taken; deep-level processing strategies are associated with performance assessments (formative assessment as assessment for learning), and surface-level strategies are associated with traditional paper-and-pencil tests (summative assessment of learning). Therefore, "students conceptions and their relationship to achievement, are consistent with formative assessment theories" (Brown and Hirschfeld, 2008, p. 13). Students who conceive of assessment as something that they do not ignore or consider as interfering with their learning are thinking along the lines of formative self-assessment. Thus, we see in these results students who reported thinking in terms of self-regulation and formative assessment tended actually to achieve more. We further suggest that it is the interaction of both believing in self-responsibility and using assessment formatively that leads to greater educational achievement. (Brown and Hirschfeld, 2008, p. 3).

Fernandes (2009) suggests that formative assessment should prevail in the classrooms at all grade levels, with the purpose of improving learning and teaching. Education policy should give the highest priority to improving learning in the classrooms through the appropriate use of formative assessment. Another advocate of formative assessment, Taras (2005) states that:

There is almost total separation of SA and FA. I defend the greater importance of FA over SA in most contexts: firstly, because FA encompasses SA (which I believe should always be explicit); and secondly, FA justifies SA, clarifies how the parameters have been addressed, and what needs to be done (p. 474).

Method

The study was done in order to find out if there was any correlation between students' preferences or tendencies towards either summative or formative assessment and their actual achievements in both summative and formative assessments measured in a full semester. The first step was monitoring students' scores that they gained through SA and FA and recorded. The scores they got from SA included only written examinations. FA scores collected were gained through assignments, class discussions, presentations, and portfolios.

Participants

One hundred-six freshmen students studying in eight different disciplines at university in Cambodia participated in this study. The samples consisted of 41 (39%) girls and 65 (61%) boys. Students were aged ranging from 18 to 21 years old. 19 (18%) students were from outside Cambodia mainly from Turkmenistan and 87 (82%) students are from Cambodia.

Procedure

The study took place during the first half of the school year (October to January). No students were informed about this study in the course of the semester in order the study to be more objective. As part of their education, the students had to do at least 5 assignments in each course they took. Considering the fact that each student took six different courses, they had to do around thirty assignments. Each assignment was completed through interactions with the instructors for meaningful feedback to the students to improve their academic achievements through either face to face interviews or online base assignment submission system. The average of their assignment scores was taken as students' formative assessment achievement. Besides assignments, as part of their semester average, students had to take quizzes and midterms. The number of quizzes and midterms varied in different courses but all of them administered in the formal summative assessment format. The average of their examinations was taken as students' summative assessment achievement.

Instruments

In this study, an eleven-point Likert scale questionnaire was designed (from 1, "Strongly disagree" to 11, "Strongly agree"). The questionnaire was put to Cronbach's alpha test three times before it was applied to make sure that the questionnaire's internal consistency or reliability coefficient would be at least 0.07 or higher. Subsequently, Student Assessment Survey Inventory was developed. It had 10 items, 5 of which were to test students summative tendencies with observed Cronbach's alpha of .80, and 5 of which were to test students' formative tendencies with observed Cronbach's alpha of .76, which are both statistically significant showing the internal reliability of the questionnaire items as well as the participants.

Results and analysis**Table 2. Items and measurements on summative and formative assessment surveys.**

N ⁰	Questions	Mean	SD
	SUMMATIVE ASSESSMENT SURVEY		
1	Exams are the most important criterion to decide if a student should pass or fail.	5.2642	2.6808
2	Exams tell me all I need about my improvement in a subject.	6.1604	2.3950
3	Below is a well-distributed assessment that motivates me to learn better. Exams (80%) + Assignment (10%) + Attendance (10%)	3.5660	2.8519
4	Exams must play the main role in terms of my overall grade in a subject.	5.1038	2.7461
5	Assignments, class-presentations and discussions, etc. are not as important as exams.	3.8113	2.5639
	FORMATIVE ASSESSMENT SURVEY		
1	Assignments, portfolios, class-presentations and discussions, etc. must play the main role in terms of my overall grade in a subject (not exams).	7.5849	2.3819
2	Below is a well-distributed assessment that motivates me to learn better. Exams (20%) + Assignments (25%) + (Portfolio (25%) + Class-Participation (20%) + Attendance (10%)	7.6226	2.6671
3	Exams must not be the only tool to assess my improvement in a subject.	8.3113	2.4971
4	Exams can not give me enough feedback on my academic improvement.	7.4245	2.3009
5	All my efforts and works (e.g., assignments, class-presentations and discussions) related to a course must be taken into consideration in terms of my average grade.	8.5000	1.9383

Table 3. Mean and SD comparisons of Summative and Formative survey averages

	N	Mean	Std. Deviation	Std. Error Mean
Summative Avg.	106	4.7679	1.94694	.18910
Formative Avg.	106	7.8962	1.67201	.16240

It is clear that there is a big difference between the means of the items in formative assessment survey and those of summative assessment survey. In order to compare means and put forward a statistically significant conclusion, one way ANOVA (test of homogeneity of Variances) was used to test for preference differences between summative and formative assessments. Difference of preferences between summative and formative assessments are statistically significant, $F(35, 70) = 1.877$, $p < .05$. This finding indicates that students prefer formative assessment to summative assessment and find it more beneficial to academically improve themselves.

Another interesting finding is that when these two variables were put Pearson product-moment correlation coefficient test, a negative correlation is found, $r(106) = -0.378$, $p < 0.01$. Even though the correlation coefficient is not very strong, it is highly statistically significant. In fact, a higher negative correlation was expected before the survey was applied. A proper explanation for this is that the summative and formative assessment student surveys were applied to 106 students in the last week of the first semester (October to January) when students were feeling inundated in the overload of assignments and portfolio presentations as part of formative assessment. Students were dominantly from Cambodia (82%) where teaching methodology is mainly traditional. In the semi-structured student interviews, students very often complained about the intensity of formative assessment (assignments, portfolios, discussion, etc.) because they were not exposed to such practices before. In the meanwhile, they also expressed their appreciation of such practices because they were given opportunities to improve their deeper level learning strategies such as critical thinking skills, communication skills, presentation skills, skills necessary to analyze, compare and contrast, etc. Because of timing of the surveys, students' responses especially about formative assessment might have been lower than expected due to the intensity of the work load.

The third item in the summative assessment survey which gives the highest weight (80%) to exams has the lowest mean (Mean= 3.5660, SD= 2.8519) whereas, the fifth item in the formative assessment survey which gives the highest weight to formative means of assessment (assignments, class-presentations, discussions) has the highest mean (Mean= 8.5000 and SD= 1.9383). This is another indication of students' expectation to get involved in more formative assessment than summative assessment.

Table 4. Mean and SD comparisons of Summative and Formative score averages.

	N	Mean	Std. Deviation
Assignment Avg.	106	65.5660	18.53029
Midterm Avg.	106	61.2264	16.04178

Table 4 shows the mean and standard deviations of students' assignment scores (representing formative assessment) and midterm scores (representing summative assessment). These two variables are highly statistically significantly correlated, $r(106) = 0.694$, $p < 0.01$. Since students learn first, then they are given summative assessment, the more they learn from formative assessment, the higher scores they tend to get from summative assessment.

It is highly convincing that there is a high correlation between the fifth item in the formative assessment survey that reflects students tendency towards formative assessment (mean = 8.5000, SD = 1.9383) and students' assignment (formative assessment) score average (mean = 65.5660, SD = 18.53029) in one semester, $r(106) = 0.666$, $p < 0.01$. We have enough evidence that these two variables are highly statistically significantly correlated or associated. In other words, as students show more tendency towards formative assessment, their formative assessment scores (i.e., assignment scores) tend to increase. Or the students who show less tendency towards formative assessment tend to get low assignment scores.

Conclusion

Assessment is a controversial phenomenon because ever stakeholder has his/her own priority or reason for their own appropriate means of assessment (i.e., assessment for learning, assessment of learning, assessment as learning). As the author of this study is an educator, what concerns him is quality of education which can be provided with better learning outcomes when assessment is used as assessment for learning (formative assessment). The findings in this study put forward enough evidence that students showed more tendency towards formative assessment than summative assessment. Brown & Hirschfeld (2008) and Karmos & Karmos (1984) (cited in Stefonou & Parkes, 2003) found that students' conception has an affect on students achievement. Therefore, formative assessment which students consider more important than summative should be used as a tool to encourage students to gain more from education.

Another finding is that students want to see that different means of assessment other than summative must be taken into consideration because they spend a lot of time and energy dealing with them. The survey results especially 5th item with the highest mean value in the Formative Survey support this point.

This study does not say that summative assessment has no merit and it must be ignored. What this study says is that even though it is difficult to establish balance between formative assessment and summative assessment (Fernandes, 2007), the common practice is summatively dominated assessment which cares about the end product. When the emphasis on formative assessment, it is more likely for the students to get motivated to learn more because formative assessment is more friendly approach to educational achievements.

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