TEST IN SCIENCE: A TRUE MEASURE OR NOT?

by:
Ginno Jhep A. Pacquing

Better quality of education is the primary goal of the Philippines’ education system thus; it is shifted to K to 12 Program. Teachers associated assessment results to good teaching and learning. The idea of developing standardized tests would measure the performance in both teaching and learning. It will be an important tool for teachers and school officials to ensure the competitive educational environment.

Tests such as paper and pencil were usually used as a traditional assessment in student learning. In the government’s effort to improve conditions of the educational institutions and to foster learning in science, standardized testing has been devised to assess performance of teachers and schools as well as to determine the degree of learning among the students (Kellaghan et al., 2009). Today, the standardized tests expand into different racial boundaries and across cultures with substantial differences exist in test purpose, design and implementation (Morris, 2011). Similarly, the Third International Mathematics and Science Survey impact the country’s effort to improve science teaching and learning. This only shows that the results from the internationally conducted tests influence our policies and other efforts to continuously aim to improve the current condition of the current science teaching and learning.

The use of standardized tests draws differing views and opinions among educational leaders in terms of its impacts on policies, reforms and instructional pedagogy implications with high stakes on the students (Wang et al., 2006). A question was posted by Lynne Ainsworth (1991), if standardized tests can make students’ grades; these tests are general knowledge tests geared to determine students’ learning. These tests were the same set of assessment questions usually in multiple choice questions to make
checking easier, conducted in different schools believed to be under same conditions. A number of literature claimed that standardized tests have little value over the real indication of students’ learning (Santiago et al., 2011)

Standardized testing seems to have become the driving force in shaping public opinions about the quality and accountability of education in 21st century learners.

Due to the variety of its applications, standardized tests are designed to suit various scenarios. Achievement tests are built to measure knowledge, skills and academic progress. Aptitude tests are more specific, to evaluate ability in a particular field or aspect and determine performance in a future setting. In the international-comparison tests are administered occasionally to all students in different countries to monitor achievement trends and compare educational performance (Monahan, 1998). At a more personal level, psychological tests measure a person’s social, mental and developmental characteristics and their cognitive abilities. (Tomlinson, 2008)

Standardized tests are administered to millions of students each year for a variety of reasons. The tests measure learned skills in core academic subjects and the results are used to evaluate instructional effectiveness and make placement and promotion decisions (Hershberg et al., 2004). However, some testing experts would argue that interpreting standardized tests in isolation is not a credible summary of what individual students know or are able to do (Harvey, 2003).

Tests in schools can be informative. Scores of students provide a quick glimpse of the current state of education. Thus, it is useful to have these numbers. These numbers may not tell everything in detail with high accuracy. Nevertheless, test results allow for a useful perspective. The National Achievement Test administered by the Department of Education (DepEd) in the Philippines, a set of standardized tests addressing the major subjects taught in school. A mean percentage score (MPS) of 75 percent is currently set as the goal of the DepEd.

It can be inferred that from the results of national achievement in science are poor passing rate because the MPS set by DepEd is 75%. The Philippines has fallen behind the world in education in terms of performance on various tests. Students are doing badly on standardized tests. While there is clearly value in assessment, it is reasonable to consider whether or not such tests are a proper and adequate measure of education. It is also worth considering whether the obsession with these tests is itself causing damage to education. That is, as teachers teach to the test and students learn for the test, it might be the case that what is being taught is not what should be taught and what is being learned is not what should be being learned.

In my view is that standardized tests seem to exist mainly to make money for the companies that sell such tests and that their usefulness as a tool of education is dubious. However, the DepEd must allot enough funds for such assessment so that the purpose of giving test will not be compromised and achieve the true purpose to really assess what students have learned.

**Nature of Standardized Test**

Standardized testing is supported by two fundamental assumptions: First, standardized tests are designed objectively, without bias and Second, standardized tests accurately assess a student’s academic knowledge.

Based on Willey, 2014, stated that standardized tests are created to be unbiased and objective, they supposedly ensure that the score of a student receives is an accurate measurement of ability and progress.

Psychology-based intelligence testing normalized dependency on numerical objectivity. Psychometricians created the assumption that assessment tests are objective
and they continue to be responsible for developing and devising standardized tests (Curtis, 2013). School reformers argued this information could only be obtained through standardized achievement testing, which would more rationally and efficiently classify student achievement.

The data collected through assessment tests can only provide a glimpse of a student’s total academic ability. Teachers used test results not just as one of many tools, but the final determining factor in making decisions concerning education. One of the anticipated benefits of testing is that students and teachers get better feedback on how they are doing. However, this assumes that the test measures every factor of the student’s life.

The assumption that standardized tests provide an accurate measure of student knowledge is still accurate, but it must be clarified with an understanding that it is only a general measurement. Nevertheless, because standardized test is so effective at accumulating data on student knowledge, school officials and policy makers, who use the data, act as if standardized testing is equally effective at identifying statistics for different criteria. One significant way that the data, acquired through standard test, is used erroneously, is seen through the idea that a student’s test scores directly reflect the quality of the education the student received. Student test scores do not automatically carry over into explaining the quality of the education. It seems logical that low tests scores are equivalent to bad schooling; but that is not a correct assumption.

**Importance of Standardized Testing**

Standardized tests have been controversial in their application, they have proved an important tool for teachers, school administrators and education officials. The objectivity of these tests has ensured that schools fulfill set standards in ensuring a competitive educational environment (Wang et al., 2006).
In this manner, students, teachers, and school officials can all be evaluated on their performances. This can also lead to accountability of teachers and school administrations on educational standards set by the government through education agency, if a particular group of students is unable to reach the required score most especially those who are in the far flung areas.

The results of these tests are important as they measure the learning outcomes of the school. Although development of the tests are costly, however, their benefits outweigh their costs by a fair margin. Utilizing a benchmark assessment based on standards provides teachers with a baseline for where students are individually as well as where the class is as a whole at selected checkpoints throughout the year. If the tests are administered at the beginning of the year, the teachers will be aware of the learning and knowledge level of students coming into their class. They will know what they are required to teach to the students during the year. If the students are competent in a particular aspect of the curriculum then teachers may not need to spend time on that part and can direct their attention to areas where the students are lacking.

Determining the timing of the tests is also important. It may be possible to train teachers to develop assessments based on the standardized tests by using the same methodology so that for midterm and final assessments they can measure the performance of their students against the results of the standardized tests administered at the start of the year (Santiago et al., 2011). Tests play an important role in assessing the effectiveness and outcomes of a Philippine’s education system. The test scores will allow teachers to identify students early on who require more specific attention than others in terms of tutoring time, counseling and parents’ involvement.

The test results can provide information to the national education (DepEd) bodies as to which schools are consistently low achievers and therefore require extra attention by the bodies. This extra attention may include additional scrutiny to identify the factors causing low performance.
Benefits and Drawbacks of Standardized Testing

Standardized testing has several benefits for educational institutions, teachers and parents of students who take part in these tests. It helps identify the strengths and weaknesses of students in relation to the national average of the students at similar age and level of education. It enables to establish accountability of teachers and schools because generally the result of the tests becomes public record. Thus educational institutions and teachers who are not performing up to the mark can be subjected to disciplinary measures and evaluated further. Standardized testing has improved educational time management, by focusing on learning outcomes of a particular aspect of the curriculum and the target areas for teachers. It allows comparison of the level of achievement of students across schools, districts and provinces. Its standard nature allows this comparison to be made. Standardized testing allows students across schools and districts to be at the same level as their peers and therefore switch schools without being ahead or behind. Similarly, standardized testing at college level would give equal opportunity to students belonging to any city of the province to enter into a university. The objective nature of standardized tests stems from the tests being scored by computers or by people who do not have any contact with student. Selecting questions for standardized test is very crucial, because it measures or assesses the learners’ academic achievement. Based on Willey 2014, questions in a standardized test can be developed covering all levels of cognitive domain of Bloom’s taxonomy. Furthermore the tests are developed after several phases of review by experts and subjected to scrutiny to avoid bias.

It is also important to note the drawbacks and limitations of standardized tests in order to be aware of the faults that may occur in relation to the results obtained. According to Popham 1999, stated that standardized tests determine the performance and achievement level of a student on a given day without considering the effects of other external factors. It may be possible that the student is not well on the day. Also it
ignores the fact that several students simply do not do well on tests because of factors ranging from anxiety, family issues.

In countries where standardized tests are at a higher degree of implementation, teachers only focus on teaching the tests to show their own performance level and to skew the performance of the colleges and schools towards the positive scale. This may mean that teachers do not focus on certain areas of the curriculum which are important but are generally not covered by the standardized tests. Since standardized tests are administered at any one particular point in time, they do not show the progress made by the students during the course of the year nor do they show the performance of the teachers and efforts put in by them to develop the students to the level that they have reached.

In world where standardized tests have been utilized over several years, funds given to the schools has been linked to the performance of the schools as shown by the results of the standardized tests. This means that teachers and students are under pressure to perform on the tests resulting in decreased time for extracurricular activities.

In the Philippine education system, National Achievement Test (NAT) is given this year to grade 7 and grade 11. Teachers’ neglect what is important in the curriculum but focused on the possible questions that will come out in NAT. Teachers are pressure in this test because NAT results have big factor in their Performance Based Bonus (PBB). The higher NAT results the higher PBB. If the schools have lower NAT results, they will just get the minimum amount of PBB. This mechanism in the DepEd is flawed it does not help to improve the quality of education in the Philippines thus; quality education in the Philippines is deteriorating it was proven in TIMSS results in science and Math.

The Philippine education agency should create a new mechanism especially in science to really test the students’ achievement in school. That would be academically
globally competitive. That would make the Philippines a powerhouse in science and technology.

**Criticism about Standardized Test**

Among the current criticism, a few stand out as most pervasive and most bothersome to those who worry over whether to support or oppose standardized testing.

Standardized test dictate or restrict what is taught. Some claims that standardized tests dominate school curriculum and results in teaching to the test are familiar and can be leveled at any time of standardized testing that has serious consequences for the schools in which it is used. On the surface it may seem inconsistent to claim those standardized tests are mismatch with what is taught in the school and at the same time to complain that the tests drive the curriculum. But those two allegations are not necessarily at odds. The first is grounded in a fear that is trying to represent everyone somewhat, standardized tests will wind up representing no one really well, the second arises from the consequent fear that everyone will try to emulate the generic curriculum.

Standardized achievement test do not promote learning. Critics charge that standardized achievement tests provide little direct support for the real stuff of education, namely; what goes on in the classroom. They do nothing process, diagnose learning problems or provide students feedback.

True, standardized tests do paint student performance in broad brush strokes. They provide general performance information in content areas like in science as the test developers have defined these areas. They do not nor are they meant to pick up the nuances of performance that characterize the full range of students’ skill, ability and learning style. Of course, we hope that standardized test results are only a small portion of the assessment information a teacher relies on in making academic decision about student or curriculum. Good classroom assessment begins with teacher’s own observation and measurements of what student are gaining from instructions.
Standardized testing can never replace that teacher-centered assessment. But it can supplement it with additional information that may help clarify a larger picture of student performance.

Not all criticism of standardized test can be deflected by claiming that they merely reflect misuse test. There are also apparent weaknesses in many tests. Partly because we have yet a good deal to learn about measurement. But even if there are no quick answers to the testing dilemma, there are things we can do. First, scrupulously avoid any misuses of tests or test results. Second, educate ourselves and our co-teachers about test so that we understand their capabilities and limitations and do not ask them to tell us more than they can. Third, stretch to the limit our creative talents in test designed, teaching ourselves to develop test items that not only resound with our own thoughtful understanding of the critical content but encourage students to think. Lastly, recall even when pressed for hasty or expedient decisions that no matter how much any test may tell us there is always so much more to be known.

Policies on Assessment

In order for the education system to become more successful in equipping students, the government needs to relinquish some control. But if the goal of education is to equip students academically and prepare them for successful living, then new methods must be developed, even if they are less efficient and more difficult to implement. Standardized assessment testing should not be the primary factor in evaluating teacher or student performance, nor should it be the main method of creating education policy and curriculum.

The Philippines has so many experts in the field of education in science particularly, the government may utilize them so the Philippines education will provide standardized assessment tests that can accurately evaluate student ability and knowledge on a national level.
In international level, TIMSS is widely respected international assessment test in science and math that consistently reveals that the Filipino students have a low science in comparison with the high scores of neighboring countries in Asia like Singapore. If this better standardized test in science had better result we can assume that we can perform better in the international assessment test in science.

Assessment testing is not designed to help teachers; it is a tool for keeping the education system accountable to government. But the inability of standardized testing to accommodate for the wide variety of curriculum has fostered the dangerous idea that education itself should be standardized.

Research has shown that parental involvement is arguably, the most important factor in determining a student’s educational success. No amount of test data will provide policy makers, or school officials, with a solution to replace parental participation. In fact, government sometimes exacerbates this issue, by supporting the false assumptions of standardized tests; fooling some parents into thinking that their children are being cared for by the school system. Nothing will influence a child’s academic success as much as the example his parents set; but for students without that support, a teacher may be able to fill the void. Therefore, assessment testing should be redesigned to be useful to the people directly involved in student development, the teachers and parents.

Therefore, the government should create a policy to place high caliber teachers in every school, rich or poor, and empower those teachers with the necessary tools to encourage parental involvement and truly assure student’s academic success.

**Philosophical Views about Standardized Test**

One of the most innovative thinkers was John Dewey. Dewey emphasized that classrooms should promote more progressive practices such as group inquiry and active construction of knowledge and socialization and that teachers should be facilitators of knowledge rather than presenters of knowledge (Owens, 2004). Hands-on learning,
scientific investigation, authentic assessments, and multiple intelligence theory are contemporary progressive instructional methods of education derived from Dewey’s educational ideas. According to Owens, Gardner’s (1993) Multiple Intelligences Theory correlated with Dewey’s philosophy of learning: Students were active learners engaged in authentic experiences that taught them how to attain knowledge through the process of scientific inquiry and exploration.

Piaget (1972), a proponent of constructivism, has had a profound impact on understanding the cognitive development of children. He demonstrated through his research how children think in different ways than adults think and he developed a stage theory to describe how children’s thinking became more complex over time (Armstrong, 2006). Discovery learning and the development of children’s interests using manipulative, field trips, and group work supported Piaget’s theory.

Effective instruction moved learners to become thinkers, problem solvers, and producers. According to Tomlinson (2000), the philosophy of differentiated instruction was a way of thinking about teaching and learning based on students’ readiness levels, learning styles, interests, experiences, and life circumstances. Tomlinson (2000) pointed out that students seemed to learn best when challenged slightly beyond where they could work without assistance. Students also appeared to learn best when there was a connection between the curriculum and their life experiences (Tomlinson, 2000).

According to Wood (1999), when standardized tests become an end unto themselves, the value of investigation, creativity, and positive social interaction is diminished and ultimately will be lost. Some educators have been backing away from recognizing students' differences because of the pressure to meet the national standards (Tomlinson, 2000). Bracey (2000) reported that teachers were abandoning their usual curricula and modes of teaching to lecture about test-oriented material; in many cases, teachers were omitting aspects of the curriculum not on the test.
According to Graham (2005), most tests are not suitable replacements for a lively and intellectually vigorous curriculum that engages students’ imaginations and interests. Many educators have learned from experience that each time a new wave of reform threatened, they could just wait for it to pass over so they could continue doing what they were hired to do.

According to Tucker and Stronge (2005), the loss of instructional time, restricted curriculum, testing anxiety, the failure that students and schools experience, and the unjustified conclusions that are drawn from test scores all argued against the use of standardized tests unless they could be put to a compelling purpose.

According to Goleman (1995), intelligence is about more than remembering facts. One of the criticisms of standardized tests was the emphasis on recognition and factual recall. Goleman stated that in order to succeed in the 21st century, students needed to be able to control their emotions, empathize with others, and solve problems. According to Wallace (2000), students in the future will need to have superior communication skills and will need to be able to analyze information, work in teams, and solve complex social problems.

According to Wood (1999), the more time teachers spent testing and preparing to test, the less time there was for real learning to occur. If schools allow success to be defined by state mandated standardized assessments and direct instructional programs solely toward improving scores on those assessments, this could limit the range of students' experiences in schools.

Based on a study, standardized tests are not narrowing the curriculum; rather they are focusing it on important basic skills all students need to master. Standardized testing had a positive impact, improving the quality of the curriculum while raising student achievement.
On the first assumption, tests are completely objective and free of bias. When looking at the role of psychometricians, it was affirmed that standardized tests are objective and unbiased, in the sense that there is only one correct answer and all tests are graded the same; but in the process of test development, there is bias towards specific populations and the need for high variance in test answers does not allow for truly objective tests. While the second assumption, tests accurately reflect student knowledge, Standardized tests do a good job at assessing a student’s mastery of the material covered in the test. However, the weakness is that standardized tests are not able to account for the wide range of variables, besides student knowledge, that could affect test results, with a trust in the objectivity of tests, the data acquired from test results are often inappropriately applied to different education policies and curricular reforms.

Standardized tests in science are good for determining the performance of schools against a national average and for establishing accountability of teachers and school administration, it is important that these test results should not be used for deciding upon the quality of education being imparted by the schools. The reason for this is that internationally standardized tests have been developed by private for profit institutes that come up with test items not answered by most students. This leads to a testing teaching mismatch as teachers may have emphasized on a topic they deem important while the test covered topics that were not given more than a cursory mention in the textbooks. Therefore, in this case the test would not show the quality of the education which may be higher than reflected by the results of the test.

Standardized testing is a unique and effective tool for assessing student knowledge but it must be used appropriately. Standardized tests are imperfect and the greater the population the test is norm-referenced to, the more inaccurate the results will be. Government has a role to play in addressing problems in the education system, but using assessment test data as an all-purpose solution does more harm than good. Education reform policy should rely predominately on input from teachers, even though
that is a supposedly, less efficient process. Standardized testing may have a meaningful role to play, but by recognizing its limitations, better-suited methods can be implemented and may be the first step in ensuring that the education system truly equips all students, to be successful students. The emphasis on standardized testing has impacted the curriculum, quality of teaching, and the pure joy of learning.

Indeed, the Philippines should be standardized the test in science before the start of the school year and end of the school year to assess if the learners obtaining the each lesson right. Implementing standardized tests in science are reliable and objective measures of student achievement in science. Without them, policy makers would have to rely on tests scored by individual schools and teachers who have a vested interest in producing favorable results.

References:


Kellaghan, T., V. Greaney and T.S. Murray (2009), Using the Results of a National Assessment of Educational Achievement, The World Bank, Washington, D.C.


Wood, C. (1999). A time to teach a time to learn: Changing the pace of school. Greenfield,

MA: Northeast Foundation for Children.