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Addressing No Child Left Behind Through Released Middle Grades Test Item

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Introduction

As educators across the nation search persistently for ways to increase student learning amid the many challenges of a diverse population, ever impatient lawmakers, spurred by President George Bush, have driven improving classroom teaching to the forefront of legislation (National Commission on Mathematics and Science Teaching for the 21st Century, 2000; Lampert, 2001). In 2002, President Bush made as his top educational priority a reauthorization of the Elementary and Secondary Education Act (ESEA), which is now commonly known as *No Child Left Behind* (NCLB). The guiding principles of this act focused on accountability for student performance, reduction of bureaucracy, increased flexibility, emphasis on proven teaching methods, and empowering parents. It included the expectations that: (1) states needed to create their own standards for what a child should learn and know in grades K-12; (2) reading and math standards needed to be established immediately while science standards must be created and implemented by the 2005-2006 school year; and (3) states must create tests that are aligned with the standards, and must report student progress yearly (U.S. Department of Education, 2005).

The goal of NCLB is for all students to achieve academic proficiency by the year 2014. Proficiency levels are commonly defined by state assessments such as North Carolina's end of course/grade (EOC/EOG) test. According to the act,

No Child Left Behind requires each state to define adequate yearly progress for school districts and schools, within the parameters set by Title I. In defining adequate yearly progress, each state sets the minimum levels of improvement--measurable in terms of student performance--that school districts and schools must achieve within time frames specified in the law (U.S. Department of Education, 2005).

Schools that fail to meet their average yearly progress (AYP) receive penalties ranging from implementation of improvement plans to governmental school take over.

Assessing student understanding of content that is aligned with national and state standards is emphasized repeatedly. This is particularly true in mathematics and science where student proficiency is norm-referenced nationally through the National Assessment of Education Progress (NAEP) test and internationally through the Trends in Mathematics and Science Study (TIMSS). The National Assessment of Educational Progress (NAEP), also known as The Nation's Report Card, (U.S. Department of Education, 2006a) is the only nationally representative and continuing assessment of what America's students know and can do in various subject areas. Since 1969, assessments have been conducted periodically in mathematics, reading, science, writing, U.S. history, geography, civics, the arts, and other subjects.

While exhaustive efforts are expended on student performance, the same can not be said for the effort being put forth to support teacher knowledge of the tests. One way of addressing this need to understand test content with middle school math and science teachers might be through the use of released NAEP and TIMSS test items.

Testing in the Middle Grades

Middle grades education has recently become the focus of research and professional development. Students at this level are making the physiological and cognitive transition from elementary school to high school, which makes middle grades a popular platform for evaluating K-12 education holistically. How middle grades students go through the learning process is thought to be a good indicator for how they will evolve as learners throughout the rest of their academic careers and ultimately this learning process will impact a school's AYP.

Some of the dilemmas that middle schools face when designing academic

programs that address both AYP and the special physiological and cognitive needs of their students are: How can curricula be designed to benefit the crucial learning stages of middle grades students; What are realistic goals for teachers to “teach for the test” or to teach to the different learning stages of middle grades students; and How much emphasis should be placed on the individual teacher to mold the curriculum versus the state providing the curriculum? How schools address these types of questions will in the end determine how they plan to attain a proficiency rating (U.S. Department of Education, 2005).

Educators know that learning is not passive but rather a highly interactive endeavor (Holiday, 1994). Garrison (1990) and Tresman (1998) suggest two-way communication between learner and instructor is central to the learning process. Garrison (1990) states, "Passive access to information is not sufficient; there must be active participation in the educational experience for information to become meaningful knowledge" (p. 15). This crucial interaction of giving and taking between student and teacher begins to evolve in the middle grades. Middle school educators understand the importance of this interaction and generally set up their classrooms to facilitate better interaction with students. Teaching is taken to mean facilitation of learning through individualization of teaching and learning and encouragement of critical thinking (Holmberg, 1989). Students are encouraged to be active learners in middle school. This is not always the case for elementary and/or high school classrooms. Therefore, one can theorize that middle grades students assimilate content in a more meaningful manner than their younger and older counterparts.

Testing, assessments, and AYP all pose threats to the middle school classroom environment and to the special learning styles of middle grades students when age-appropriate, student-responsive instructional strategies are marginalized by passive “teach to the test” instruction. In reality, teachers who say they “teach to the test” actually “tell” students the content, ultimately breaking down the vital two-way, interactive communication/learning process between teacher and student. Sadly, students who are exposed to this “teaching strategy” not only are unable to regurgitate teacher responses on standardized tests, they also rarely achieve academic proficiency. Therefore, it is essential that middle grades teachers not only prepare students for assessments but, more importantly, understand how to prepare students for assessments without having to sacrifice successful middle grades instructional strategies.

For science and math, much of what is known about students learning on a national and international level can be gleaned from results of the NAEP and TIMSS. Since these tests are referred to as the best indicators of student progress, teachers need to know test objectives, item structure, and test design to be able to help their students.

New technologies and specifically the Internet provide insight into these test objectives, item structure, and test design by hosting released test items from the NAEP and TIMSS. If used properly, these items not only help prepare students as better test takers but also teachers as better equipped to focus more on appropriate instructional strategies and less on testing. When teaching moves away from teaching to the test, it becomes teaching to students - freeing students to excel and to communicate. Testing examples offered through the Internet suggest accurate and successful instructional methods for teachers to model give and take interactions with students that are so crucial to lifelong learning as well as meeting and surpassing state standards. As former US Secretary of Education Rod Paige (2002) eloquently notes, by using the Internet as a tool and harnessing technology, we can expand access to learning and close the gap in America. The new education reforms (i.e., NCLB) say loud and clear - one size does not fit all when it comes to educating our children. We must challenge the old ways. We must be innovative and creative in our thinking. We must do whatever it takes to help ensure that every child is educated.

Using Released Items

The question then becomes how can released NAEP and TIMSS items on the Internet be useful for middle grades teachers and subsequently their students? These test items provide a good measure of knowledge. They come from assessments that are highly regarded as the science content knowledge benchmarks for both teachers and students. Items have been piloted, administered, and tested for validity. Item banks are plentiful, and the opportunity to choose which items align with individual teacher instruction is less difficult and time consuming than when teachers create test items from scratch. Further, the items are more valid and reliable than teacher-made questions that have not been piloted. Additionally, test items relate to both grades four and eight, and even if one does not teach in these grades it is not uncommon or unrealistic to use these items for assessing students. Most importantly, teachers can access all item data including scoring criteria, common student responses, and more (see Figure 1).

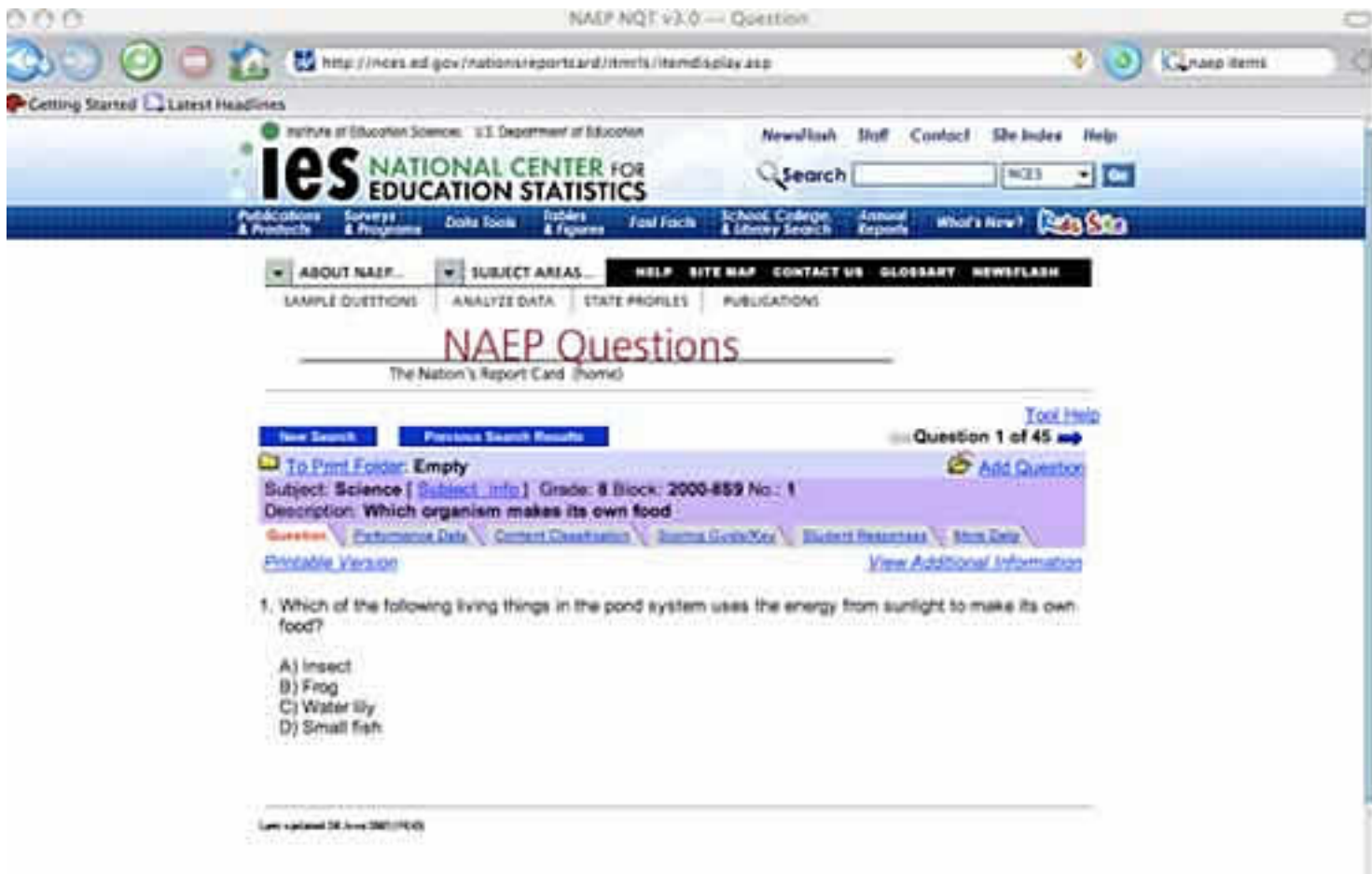


Figure 1. An example of an NAEP released item and associated data from The Nation's Report Card (U.S. Department of Education, 2006a). Released items from past tests, performance data, content classification, scoring guides, sample student responses, and additional information can be accessed from: <http://nces.ed.gov/nationsreportcard/itmrls/pickone.asp>

NAEP Released Items

The National Assessment of Educational Progress (NAEP), also known as The Nation's Report Card (U.S. Department of Education, 2006a), is the only national representation of what American students know and can do in various subject areas. Currently, the Commissioner of Education Statistics, who heads the National Center for Education Statistics, U.S. Department of Education (2006a), is responsible by law for carrying out the NAEP project.

Individual student and/or school scores are not reported by NAEP; rather NAEP provides content area achievement for various populations. Released results are based on samples of student populations from a variety of areas. NAEP assessments include a large percentage of constructed-response questions. Innovative types of questions have been used in assessments such as the arts (theatre, music, and visual arts) and science to measure students' ability to

perform hands-on tasks (U.S. Department of Education, 2006a).

TIMSS Released Items

The Trends in International Mathematics and Science Study (TIMSS) was designed to set benchmarks for over 50 countries worldwide with the ultimate goal of improving student learning in mathematics and science. The results of these tests shed light on educational achievement at the 4th and 8th grades, and, thus, provide information about trends in student performance (U.S. Department of Education, 2006b).

The TIMSS project is a mission of the IEA, which is headquartered in Amsterdam, and is currently directed by the TIMSS International Study Center at Boston College (<http://nces.ed.gov/timss/>). Tests are administered on a regular four-year cycle. The third round of tests has recently been completed and the results can be viewed at: <http://nces.ed.gov/timss/Results03.asp>. The first round of TIMSS was in 1995, the second round in 1999, and the third round in 2003. Released items from the 1995 test can be accessed at: <http://timss.bc.edu/timss1995i/study.html>. Items from the 1999 test can be accessed at: <http://timss.bc.edu/timss1999i/Items.html>, while the latest items can be accessed at: <http://isc.bc.edu/timss2003i/released.html>. Formatted differently on the web, the documents are downloadable in PDF format (see Figure 2).

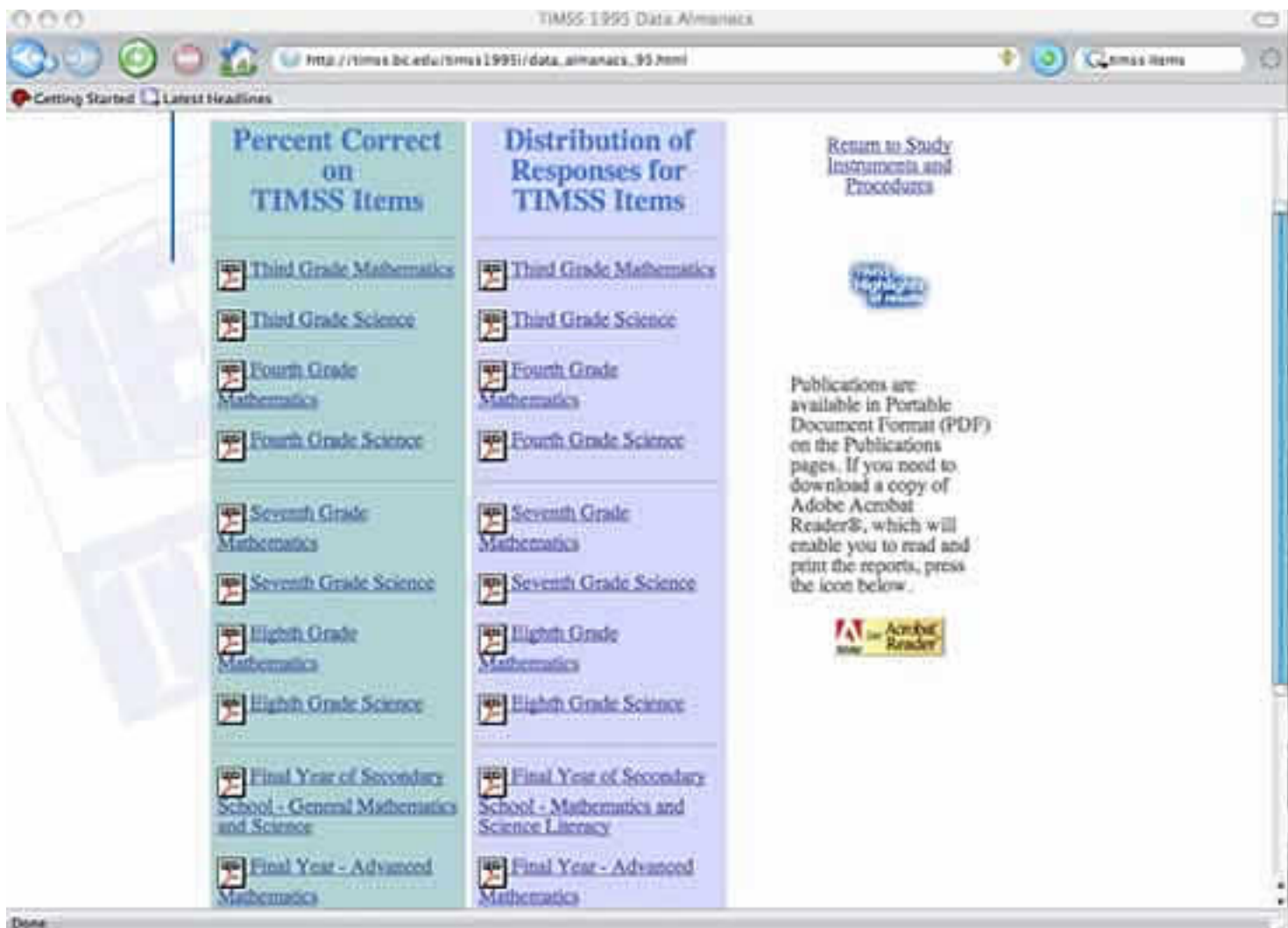


Figure 2. Distribution of TIMSS items (data almanacs for achievement items) from the International Study Center, Boston College, Lynch School of Education Web site: http://timss.bc.edu/timss1995i/data_almanacs_95.html

Conclusion

Preparing students who can think critical and independently in the face of standardized testing is arguably the most challenging component of instruction for today's educators. Assessing student knowledge, whether as prior knowledge or as a summative assessment, is a difficult but worthwhile task if properly planned. Using released test items from norm-referenced tests such as NAEP and TIMSS can effectively prepare students for standardized tests and provide valuable data to inform rather than inhibit future instruction for middle school students.

The notion of a perfect assessment is as intriguing as the theory of cold fusion in chemistry. We would like to believe that it could be accomplished. However, what remains to be seen is the true definition of perfect. What works for one may not work for another. Carl Sagan (BrainyMedia, 2006) said, "There are many

hypotheses in science which are wrong. That's perfectly all right; they're the aperture to finding out what's right." This statement rings true in the quest for assessing meaningful student learning. As No Child Left Behind remains paramount in Washington, D.C., it becomes increasingly more critical to use technology to reach teachers and to assess student development and learning. The Internet provides a plethora of information for teachers. The key component to successful instruction for all educators at all levels is to keep the communication and dissemination lines open. Funding for technology integration in schools is only second behind funding for increased reading. Educators at all levels must communicate how the Internet and other technologies can be used to inform and improve instruction, and we must all continue to be researchers determined to find the perfect assessment model. We can learn from what others have attempted, and let those attempts be the "aperture to finding out what's right."

Although technology use in middle schools often focuses more on student use and benefit, the teacher remains the catalyst for student learning. Research on the ways technology can assist teachers in planning lessons and preparing students is lacking in the literature. This article addresses one example of technology benefiting instruction wherein the Internet provides an abundance of resources through released NAEP and TIMSS test items. Much more research is needed. If No Child Left Behind continues as the focus of our educational system it then makes sense that we should follow the notion of No Teacher Left Behind as well.

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