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Teaching One Way and Testing Another: An Interview with Scott Howell

by James L. Morrison and Scott Howell

I first met Scott Howell in 2005 in Jekyll Island, Georgia at the annual Distance Learning Administration (DLA) [conference](#), which was sponsored in part by the Online Journal of Distance Learning Administration ([OJDLA](#)). Scott is co-editor of the three-volume book series *Online Assessment and Measurement* (2005) published by IDEA group and is this year's chair of the University Continuing Education Association's ([UCEA](#)) Distance Learning Community of Practice ([DLCoP](#)). His keynote speech at the DLA conference featured a number of assessment issues and best practices. However, when I sat down to interview him, he quickly focused on one topic for which he expressed more passion and concern than others—the alignment of testing and assessment methodology with the presentation of instructional content.

James L. Morrison [JM]: Scott, tell us about your background in educational assessment and the three-volume book series *Online Assessment and Measurement*.

Scott Howell [SH]: My academic path, while not a typical one, has helped shape my views on the importance of aligning tests with instruction. I came to higher education from the corporate world, having a bachelor's degree in business management and a master's degree in education. I was hired by Brigham Young University ([BYU](#)) as a financial aid administrator when I decided to pursue, on a part-time basis, a doctoral program in instructional science. While still working on my doctorate, I transferred to the BYU Department of Continuing Education as an instructional designer. My new department was interested in assessment at the time and invited me to specialize in the area. My dissertation studied the effects of test blueprints on test development and student learning. Later on I was invited by our university administration to head up an online learning initiative at our campus as the director of the [Center for Instructional Design](#) during the exciting years (1998–2003) of online experimentation. This unusual career path and blend of professional, pragmatic, and academic experience have informed my perspective.

The book series grew out of the need that my co-author, Mary Hricko of Kent State, and I felt for more discussion on assessment in the emerging online environment. We both saw the inevitable paradigm shift—predicted by a multitude of futurists—that technology would bring to instruction in our schools and classrooms, but no one seemed to be talking about the effects of this shift on assessment generally and testing specifically. Everywhere we turned, we read and heard about educational technology changing the way our teachers taught and our learners learned; however, we noticed that much less was being said about how our teachers test and our learners are tested. Our call for chapters was met with such an overwhelming response that our publishers authorized the [three-volume series](#).

The first volume focuses on the foundational issues of online assessment; the book's 16 chapters distributed over four sections are listed in [Exhibit 1](#). The second volume features case studies from K–12, higher education, and corporate education. It was evident from the experiences of many institutions that they had not anticipated all of the theoretical, technical, and practical challenges presented by the integration of educational technology into their assessment environments. However, as disruptive as the technology may have been to these institutions, it also gave them an opportunity to reinvent and better prepare for the inevitable changes that would come to their assessment and testing practices. The final volume is the most academic and futuristic of the three and also introduces more of the effects of technology on educational evaluation.

JM: I am intrigued by your research on test blueprints. Tell us more about test blueprints.

SH: Gladly. One of the challenges that we face in education is preparing our teachers not only to teach but also to test. Rick Stiggins, the founder of the [Assessment Training Institute](#), which is now a part of Educational Testing Service (ETS), told me that K-12 educators spend as much as a quarter to a third of their professional time in test- and assessment-related activities, but most have had little or no formal instruction on how best to test and assess (personal communication, December 17, 2006). It is probably not too different in higher education.

A test blueprint is the foundation of good assessment. It is a document that maps learning objectives and outcomes with test items and quickly identifies any gaps for its authors. I have seen test blueprints that are quite simple and some that are very sophisticated. The best test blueprints also include learning levels (e.g., [Bloom's Taxonomy](#)) and other metadata for each test item. Most psychometric texts discuss the critical role test blueprints play in test development—low and high stakes—to ensure content validity. Readers who are not familiar with test blueprints should look at the [example](#) presented by the Department of Educational Technologies at Virginia Tech and see an explanatory page about test blueprints prepared for student participants in my dissertation study ([Exhibit 2](#)). The dissertation examined the effects of sharing a test blueprint with students in a Humanities 101 course at Brigham Young University (Howell 1994). In practice, most instructors don't really know what a test blueprint is, and if they do, they don't bother creating one. Furthermore, publishers are quick to provide ready-made test item pools in the absence of a test blueprint and, unfortunately, instructors typically overuse these banks when creating their own tests. In my experience test blueprints do take work, but they are the only way to ensure test integrity—there are no shortcuts.

When instructors actually use a test blueprint, they quickly identify learning objectives or outcomes that are not as important as others and frequently revise, or even eliminate, these learning outcomes. The iterative process of reconciling test items with learning objectives ensures an accountability that improves both teaching and testing. I remember reconciling test items with learning objectives as an instructional designer, only to discover how many learning objectives were not even covered and how some were measured excessively. When I showed instructors the uneven mapping of test items to learning objectives, they were surprised. If we added the manner in which the instructional objectives are taught and tested to the test blueprint, the unevenness would even be more profound. I remain convinced that test blueprints are the foundation of good assessment and that the time to consider adding this third dimension has come.

JM: Okay, let's talk about alignment between the way we teach and the way we test.

SH: Our earlier discussion about test blueprints should be helpful. Psychometricians refer to the alignment of content with test items as content validity. Test blueprints help ensure this alignment. If this alignment was not a problem before, it is one now as educational technology has become so much a part of classroom and distance instruction. In the past ten years, most educators have experienced firsthand the dramatic changes that have resulted from the ubiquitous adoption and integration of educational technology; one scholar considers the effects of educational technology to be as significant as the invention of the Gutenberg press (Privateer 1999). He suggests that just as the press turned the educational world upside down in its day, educational technology is having a similar impact in our day. Our vocabulary has expanded to include many terms and concepts which either had not been created yet ten years ago or had not assumed the meaning they now have. For example, how many of these terms had meaning to you a decade ago: e-learning, virtual environments, computer literacy, open source, podcasting, webcasting, Webinar, WIKIs, Web portals, electronic discussion boards, multimedia, voice-over IP, synchronous vs. asynchronous communication models, personal digital assistants (PDAs), iPods, [Merlot](#), Macromedia Flash, applets, computer gaming and simulation, computer and video conferencing, or learning and content management systems (e.g., [Blackboard](#) and [Moodle](#))? This is really what I am trying to say: Beyond the age-old challenge of aligning our instruction with our testing, we now have the years-old challenge of aligning the way we deliver instruction with the way we assess it, given our rich, robust multimedia environment. Instructors and designers must seek new ways to integrate appropriate methods of testing in such an environment, ensuring that innovative course design remains tied in with consistently clear, focused assessment of student learning ([Exhibit 3](#)).

Let me give you an example of how much educational technology has integrated itself into our university courses. Just a few years ago, our instructional design team worked with a faculty team to design an introductory science course that was used by many students to satisfy a general education requirement. Using the latest technology available to us at the time, we developed a course with 34 lessons and 136 learning objectives that had the following presentation elements or learning objects: 391 interactive animations, 272 graphics, 153 video clips, 18 3-D animations, and 17 Java applets. You know where I'm going next—how many of the same or similar elements were found in the final exam? None! I was also told recently by our testing center director that he has seen little change in the 800,000 classroom paper-and-pencil tests that they administer each year.

JM: Are you telling us that just because a test is administered online, it is better aligned with online instruction?

SH: No. Thank you for pointing that out. If an online instructor administers a linear, two-dimensional grayscale paper test or a "bubble sheet" form online, it is no better aligned to rich, robust multimedia instruction than the paper version of the assessment. This is what I heard someone characterize as "shovelware"—taking paper-based content and simply recasting it with html code.

I have also observed the other extreme—where faculty or instructional design teams have appended multimedia of every variety and sort to the instructional experience just because it could be done. This practice actually distracted from the learning process rather than added value to it. Although online testing is not widely utilized by instructors, the same generalization would nevertheless apply to multimedia-enhanced online testing as well. As Linn and Miller (2003) have observed, "In the long run, the potentially more significant changes in testing as the result of computer-based testing depend on using the computer to do things that cannot be reasonably accomplished with paper-and-pencil tests"; in particular, they cite the use of video simulations as a trend that we can expect in the future (13). There is no question that the effective use of educational technology for instruction and testing can make a difference, but in every instance that it is used, it must also pass the value-added test; if it doesn't add learning value, then it shouldn't be used. Research conducted by Vogel and Klassen (2001) has validated what most of us assume anyway—that the "effective use of presentation visuals significantly increases student comprehension and retention, especially the use of color and some degree of animation" (106). Generally, I believe the appropriate use of educational technology has added value to our instruction. However, I also believe that our problems with testing have been exacerbated by the advances made in the use of multimedia-enhanced instruction that have yet to spill over into tests.

JM: Who in the academic community today is examining this specific topic of alignment?

SH: While much research has been done in the past on content validity and alignment, including the use of test blueprints, the one academic who has researched this topic most recently is Michael Russell, associate professor at the [Lynch School of Education](#) at [Boston College](#). Professor Russell is also a senior research associate at the Center for the Study of Testing, Evaluation, and Educational Policy ([CSTEPEP](#)) and has looked at this testing issue in light of the increased computer literacy of the new generation of students. He and his colleague reported that "recent research shows that written tests taken on paper severely underestimate the performance of students accustomed to working on computers. The situation is analogous to testing the accounting skills of modern accountants, but restricting them to the use of an abacus for calculations" (Russell and Haney 2000, "Introduction," ¶2). He also wrote an article entitled "It's Time to Upgrade: Tests and Administration Procedures for the New Millennium," a title that clearly delineates what needs to occur in the educational setting in order to bring instructional goals and test presentation into better alignment (Russell 2000).

JM: Where do you think we should go next? What do you believe are our challenges?

SH: This is the hard part. It is much easier to point out problems than it is to solve them. The issues that

surround this problem are complex.

Just a few years ago I remember reading one research study after another that were identifying obstacles to technology adoption in the educational setting. Some of these obstacles—faculty unfamiliarity, usability problems, inadequate IT infrastructure, insufficient instructional design resources, exorbitant software and hardware costs, frequent system and software upgrading—still exist, but not to the extent that they used to exist. I just don't see how we can continue to blame these earlier obstacles for our failure to align the way we test with the way we teach. That said, I am willing to speculate a bit on what I think may be causing this growing chasm between the way we teach and the way we test.

I think the most significant impediment to this alignment has something to do with the requirement established by accrediting agencies, educational institutions, subject teachers, and other stakeholders that tests be carefully proctored. Having institutions provide proctored computer labs (or repurpose existing computer labs during testing periods) that are adequate enough to meet the number of testing administrations is one of our biggest challenges. Another related challenge is securing computers to disallow online crib notes, outside Internet surfing, and other forms of cheating. Distance education students, their instructors, and their educational institutions may also incur a financial burden in paying commercial proctors to administer computer-based exams. Furthermore, educators who use commercial proctors are required to meet stringent test specifications, which costs more time and money.

My experience in working with faculty over the years as an instructional designer also tells me that assessment is frequently overlooked because faculty members are busy, and assessment is not always an institutional or individual priority. Many instructors refresh their instruction each year, but they update their exams much more infrequently. This tendency would only be made worse by the additional work that developing and then refreshing multimedia exams involves. While there are probably more impediments to this alignment problem than I have mentioned, it is clear to me that we have our work cut out for us as we seek to remedy the problem.

JM: You have focused on instructor-based instructions and tests to this point, but what about student-centered assessment? Where does it fit?

SH: I'm really glad you asked about student-based or learner-centered assessment. Today's students may have more need for, and proclivity toward, learner-centered assessment than any previous generation because they, and the technology they have grown up using, are more sophisticated than ever before. This new generation of learners, sometimes referred to as "Generation Y," the "Net Generation," "Millennials," or "Digital Natives," are more comfortable doing their homework using computers, keyboards, Internet resources, and multimedia files than they are working with books, encyclopedias, pens or pencils, and notepads. Many of these students wonder if they even need a teacher in a classroom anymore. They are also better networked with, and connected to, both their teachers and their fellow students, and they are more familiar with information technologies such as e-mail, instant messaging, text messaging, discussion boards, blogs, and search engines.

Utilizing learner-centered assessment and improving alignment between instruction and testing is now more possible than ever before because of these technologies. At some time or another, it has been the wish of teachers to be able to leverage their limited time and customize instruction and assessment to meet the unique needs and abilities of one of their students. It has also been the wish of learners that their teachers could design instruction and assessment for their individual learning abilities, styles, and circumstances. (We are starting to see this happen with the increased use of computer adaptive tests by testing companies and others—this topic merits its own discussion.) Indeed "we must constantly remind ourselves that the ultimate purpose of evaluation [assessment] is to enable students to evaluate [assess] themselves. Educators may have been practicing this skill to the exclusion of the learners. We need to shift part of this responsibility to students" (Costa 1989, 2). And if we really do shift some of this responsibility to students, I believe we will see the gap between the way we teach and the way we test narrow more quickly.

I was pleased to read in a just-released edition of an important text on classroom assessment that its author

has suggested a number of learner-centered assessments relevant to our conversation. I will highlight just a few from the much longer list: require students to help develop the test blueprint, and have them "develop assessments and scoring criteria," "develop practice test items," "maintain learning portfolios," "participate in scoring the assessments," and "construct test items and justify how they will measure student performance" (McMillan 2007, 146-7).

I have actually experimented with some of these options in my own classes. One year I gave my students a project assignment that required them to prepare a few exam questions from each of their readings with the assurance that some of their own questions would appear on the next test. The students were surprised by how difficult it was to write good questions and I was just as surprised by how good some of their questions were. (Incidentally, I had few complaints on my exams that semester.) I would like to expand the assignment next time so that the students would develop test items using a presentation context similar to that of the instructional context.

JM: Any concluding thoughts?

SH: I appreciate this opportunity to discuss with your readers the importance of testing like we teach. I hope we can all do something to ensure the most effective alignment of our teaching and testing methods at our own institutions. Another academic has challenged us to begin doing something about this problem with these words: "As the environment changes for the delivery of instruction, it is important to reevaluate the ways in which we assess the learning outcomes for students using this new format and develop and apply assessment techniques that are more consistent with the learning environment" (Frederick 2002, 17). Let's begin the reevaluation of the way we have, and the ways we haven't, approached the way we test in this new milieu!

JM: Thank you. Your insights about this need for better alignment between our instructional and testing methods will be most helpful to policymakers, innovators, educators, and, hopefully, other researchers as they seek to bridge this chasm.

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