



## Alternative assessment in higher education: An experience in descriptive statistics

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### ABSTRACT

Assessment-led reform is now one of the most widely favored strategies to promote higher standards of teaching, more powerful learning and more credible forms of public accountability. Within this context of change, higher education in many countries is increasingly subjected to demands to implement alternative assessment strategies that provide outcome measures of both student and program effectiveness. This article examines a process of integrating real-life data investigation in a course on descriptive statistics at a teachers college. The article describes this process and considers implications of this experience in terms of its potential to improve the quality of learning and assessment of knowledge in descriptive statistics in higher education.

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### Introduction

Assessment-led reform is now one of the most widely favored strategies to promote higher standards of teaching, more powerful learning and more credible forms of public accountability (Black, 1998; Hargreaves, Earl, & Schmidt, 2002). Although large-scale, legislated assessments receive the most attention, classroom assessments matter most of all. They drive student pedagogy and student learning. Many educational reforms have heralded new classroom assessment approaches that go beyond traditional techniques to include strategies such as performance and portfolio-based assessment (Eisner, 1999; Stiggins, 1997). Within this context of change higher education in many countries is increasingly subjected to demands to implement alternative assessment strategies that provide outcome measures of both student and program effectiveness.

This article examines a process of integrating real-life data investigation in a course on descriptive statistics at a teachers college. The article describes the process of authentic assessment, which included assignments in which students collected and analyzed real-life data and subsequently discussed their findings. Mainly, however, this article considers implications of this experience in terms of its potential to improve the quality of learning descriptive statistics in higher education.

The article has three parts. The first focuses on defining alternative assessment and the rationale for implementing it in higher education. The second and main part presents the process of integrating alternative assessment in teaching descriptive statistics and highlights insights that arose while the course was being taught. And finally, the third part sums up the article and offers some implications.

### Implementing alternative assessment in higher education

Recently, as many traditional education values and ideas have been challenged, it has become necessary to re-evaluate learning, teaching and assessment processes. At the same time that assessment practices have come to play a central role in the evolution of higher education, the theory and practice of assessment have undergone qualitative changes leading to new approaches regarding its aims and purposes (Levine, 2002). Fetterman (2001, in Levine, 2009) regards recent developments as a quiet revolution undermining all the basic assumptions related to assessment and its consequences. Especially significant is the transition from a positivist to a constructivist and critical world outlook. The transition from monolithic to pluralistic conceptualization emphasizes the importance of varied methods, measures, points of view and needs. In the wake of these conceptual changes, assessment activities have relinquished the technical approach which gives priority to clear and definite interpretation of findings in favor of cooperative attempts at dialogue as a way of deriving meaning.

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Assessment is a powerful force in schools as well as in tertiary education frameworks. Assessment processes influence the way students learn, as well as the content and the extent of their learning. They also affect the way teachers select and teach various types of content and, indirectly, the way they decide what not to teach. Assessment processes also affect the level and the quality of educational achievements, the learning strategies students develop, cultures of teaching and learning, teachers' professional image, and the self-image and motivations of the learners.

Paradigmatic changes which have occurred over the past two decades in various aspects of assessment become apparent from the methodological perspective as well. In this perspective they point to transition from assessment based on quantitative, specific and standard data to a methodology which is cognizant of the need for flexibility and sensitivity to context. Thus we witness the development of collective processes of imbuing meaning which take advantage of interpretive evaluation and relate to multi-varied needs of clients. Stake (2004) chooses to refer to this kind of evaluation – responsive evaluation – as opposed to standard-based or criteria evaluation. Stake defines responsive evaluation as a process “which builds upon experiential, personal knowledge in real space and real time and with real people” (p. 15).

Alternative assessment strategies, therefore, go beyond traditional psychometrically driven testing. Such alternative assessments are designed to assess learning tasks that stimulate critical thinking skills and require students to produce or demonstrate knowledge rather than simply recall information provided to them by others (Cummings, Maddux, & Richmond, 2008). Current testing practices often neglect the assessment of more complex thinking processes. If the ability to engage in complex reasoning is a desired outcome of higher education, assessments should challenge students to elaborate, make connections, explore assumptions and apply nonalgorithmic thinking. Alternative assessments are often intended to motivate students to take more responsibility for their own learning, to make assessment an integral part of their learning experience, and to embed it in activities that stimulate students' abilities to create and apply a wide range of knowledge, rather than simply engaging in acts of memorization and basic skill development (Eisner, 1999; Hargreaves et al., 2002; Harlen & Deakin-Crick, 2003; Stiggins, 1997; Wolf, Bixby, Glenn, & Gardner, 1991). The point of alternative assessments, however they are labeled, is not that they are ends in themselves but that they are designed to foster powerful, productive learning for students.

Higher education has evolved in recent years toward incorporation of new, alternative evaluation systems (Birenbaum et al., 2006; Burkaitiene & Tereseviciene, 2008; Dochy, 2004). These systems represent a shift from the instructing-teaching paradigm based on the central role of the teacher to a paradigm of learning focusing on the learner. This paradigmatic shift puts an emphasis on enabling the student to self-regulate and self-assess his/her own learning and fostering his/her responsibility for the learning results; from traditional summative, end-of-course examinations-based assessment to formative, performance-based assessment approaches, which are becoming more common in tertiary education.

Changes in modes of assessment represent major paradigm shifts in thinking about learning and teaching. Expanded understandings of the constructivist nature of learning accompany these emergent perspectives. Learning is viewed as an active process wherein individuals construct meaning based on prior experiences. These changes dictate teaching and assessment strategies that reflect the dynamic nature of knowledge (Bransford, Brown, & Cocking, 2000; Eisner, 1999; Fosnot, 1996).

Another rationale for performance assessment is that it ensures that students are well equipped to participate in the increasingly

complex world of work in a global economy (Cummings et al., 2008; Eisner, 1999; Shepard, 2000). Because the dynamics of the business world change so quickly, specific skills that students acquire in college may no longer be relevant once they begin their careers. Accordingly, today's employers are asking that colleges and universities prepare students to be critical thinkers who have attained the higher level cognitive, metacognitive and social competences necessary for them to engage in effective problem-solving, teamwork, communication and leadership (Cummings et al., 2008; Eisner, 1999; Shepard, 2000).

In order to meet these workplace demands, institutions of higher education must develop more powerful learning environments that integrate instruction with more appropriate assessment activities. Students then would be exposed to meaningful learning tasks requiring them to construct knowledge rather than reproduce information that others have discovered. Corresponding assessment activities would be directly related to the learning tasks and would tap higher level thinking and problem-solving abilities. Additionally, they would measure the extent to which students can apply knowledge to solve real-world challenges and make appropriate decisions (Birenbaum et al., 2006; Cummings et al., 2008; Eisner, 1999).

The changing nature of knowledge, as well as the demands of the new century, suggests that traditional approaches to evaluation need to be supplemented by assessment procedures that reflect these changes. Teaching and assessment are inextricably intertwined. How we assess students drive both what and how we teach. “Good teaching is inseparable from good assessing” (Wiggins, 1989, p. 33).

The simplest definition for alternative assessment is a form of assessment other than traditional assessments, such as multiple-choice tests and other usual forms of classroom assessment. Such a definition leaves the door wide open for a range of assessment techniques. Examples of alternative assessment formats are: performance, portfolio, cooperative learning, self-evaluation, journals, simulations, exhibitions, among others. An important facet of many alternative assessment methods is that they are authentic and focus on process as well as product (Birenbaum et al., 2006; Davies & Wavering, 1999; Eisner, 1999; Shepard, 2000).

Over the last three decades, non-traditional methods of learning and assessment – problem-based learning, project-based learning, peer/cooperative learning and portfolio-based – learning have been introduced in different courses at different levels of education, including higher education institutions (Biggs, 2002; Frank & Barzilai, 2004; Norton, 2004). A plethora of evidence supports their usefulness for learning and assessment purposes in several domains of higher education: arts studies, engineering, teacher training, medicine, foreign languages and statistics (Barfield, 2003; Burkaitiene & Tereseviciene, 2008; Frank & Barzilai, 2004; Garfield & Ben-Zvi, 2007; Knapper & Cropley, 2000; Miller, 2003). However while many higher education researchers accept alternative assessments as effective tools of learning and teaching, this paradigmatic shift in classroom assessment is certainly controversial and is subjected to criticism regarding its advantages (Hargreaves et al., 2002; Kirschner, Sweller, & Clark, 2006). Bearing these caveats in mind, we initiated a project to create an alternative learning and assessment environment integrating real-life data analysis in a course of descriptive statistics. Some insights emerging from this experience are presented in this article.

## Methodology

In the study groups that this article describes, the students learned descriptive statistics by practicing the acquired contents

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