PORTFOLIO ASSESSMENT

AN ASSESSMENT STRATEGY WHOSE TIME HAS COME FOR DOCUMENTING COMPETENCY IN DENTAL EDUCATION AND BEYOND

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ABSTRACT

The Institute of Medicine report on dental education in the mid-1990s called specific attention to the need for authentic assessment of student progress and outcomes. This corresponded with the advent of competency-based dental education, resulting in recognition of the need for new methods to assess dental students knowledge, skills, and values in the context of beginning independent dental practice. The portfolio approach to assessment uses a rich collection of cumulative evidence from multiple sources in ways that address this need. Because students take some responsibility for maintaining their portfolios, the competency of reflective critical thinking can also be assessed by means of portfolios.

Several reports written over the past two decades have called for a change in dental education (Field, 1995; Pyle et al, 2006; Tedesco, 1995). This paper will focus on the role of assessment in dental education and more specifically on the use of authentic assessment in the form of portfolios for documenting student competency. The author will start with a review of events that have lead dental education to think about nontraditional forms of assessment followed by an examination of how portfolio assessment, as one form of non-traditional assessment, could take dental education "beyond the crossroads" of change.

In 1995 the Institute of Medicine (IOM) published a report, *Dental Education at the Crossroads: Challenges and Change*. This landmark report was written following an independent evaluation of dental education and called for change in the way we educate oral healthcare providers. While there were several recommendations that flowed from this report, the one pertinent to this paper was the call for alternative models of education, practice, and especially assessment. Specifically, improvements in the methods of assessing educational outcomes and professional competence were identified as central to improving dental education and ensuring competency for licensure, assessment of continued competence, and institutional accreditation (Field & Jeffcoat, 1995). In light of this call for

change the report acknowledged there has been an overall historical resistance to change in dental education.

Dental education participates in professional accreditation through the American Dental Association Commission on Dental Accreditation (CODA). The stated goals of CODA are: (a) to foster educational excellence, (b) to support programmatic self-improvement, and (c) to assure the general public of the ongoing availability of quality dental care (Commission on Dental Accreditation, 2009). The commission receives its accreditation authority through recognition by the United States Department of Education (USDE). The USDE in turn establishes recognition requirements that an accrediting agency must meet in order to be recognized. Of particular importance to institutions of higher education is that eligibility for federal funding is linked to recognition by the USDE.

Looking back, the last decade of the twentieth century can be seen as the beginning of an era of assessment and accountability for higher education. In the fall of 1988, then Secretary of Education William Bennett issued an executive order requiring all federally approved accreditation organizations to include in their criteria for accreditation evidence of institutional outcomes. Secretary Bennett's executive order

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specifically held higher education institutions accountable to accrediting bodies for producing and documenting outcomes. Following Secretary Bennett's executive order states jumped into the assessment and accountability debate and by the mid-1990s there began to be shifts in state focus and formula funding from input (number of students, library holdings, etc.) to output (number of graduates, average time to graduation, etc.). One measure of outcome or output which received considerable attention in education was student competence.

ASSESSMENT OF COMPETENCY

In response to the IOM report and in conjunction with the educational reform . initiatives outlined above, CODA adopted standards for a competency-based curriculum for dentistry in 1998 and dental hygiene in 2000. The revised standards included the provision that competencies be developed for all aspects of the program as well as outcomes assessment that would track attainment of the competencies. The issue of competency and defining what competency means has been written about extensively. Specific to dentistry, a series of articles was published to define and unpack exactly what was meant by competency (Chambers, 1994; 1995; 1996; Glassman & Chambers, 1998) . These authors define competency as the skills, understanding, and professional values of an individual ready for beginning independent dental or allied oral healthcare practice. Additionally, the competent

individual is able to apply critical thinking and problem-solving skills to today's complex healthcare environment. With this definition as a starting point it became apparent that educators would be accountable for effective teaching and learning strategies to encourage and develop critical-thinking and problem-solving skills. Not only must we incorporate teaching strategies to promote critical thinking and problem solving into the educational curricula but we also must find effective methods for evaluating critical thinking, problem solving, and ultimately competency. In the context of the previous outline of national initiatives pushing for change in higher education, the next portion of this paper will address a national response from within dental education for change.

Fast forward to 2005 when the American Dental Education Association (ADEA) formed the ADEA Commission on Change and Innovation in Dental Education (ADEA CCI). The formation of the ADEA CCI was in response to repeated calls for curricular reform and innovation in dental education that did not seem to be happening with any coordinated effort across the United States. A series of white papers was commissioned to address critical considerations in curricular innovation (American Dental Education Association, 2009). While eight core principles were proposed by ADEA CCI as integral to shaping the

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dental education environment, two are particularly pertinent to this paper: (a) the importance of dental education operating in an environment that promotes critical thinking and problem solving by developing "self-directed, self-disciplined, self-aware, and self-corrective learners" (Haden et al, 2006); and (b) the importance of dental education promoting self-assessment, as this has been shown to lead to critical thinking and problem solving.

Chambers (1995) states that one of the hallmark characteristics of a competent individual is the capacity for accurate self-assessment. Self-assessment requires students to take responsibility for their own learning by identifying what they know and do not know and solve problems in ways that address knowledge gaps. If we are to graduate competent dental and dental hygiene students, there should be opportunities throughout the curriculum for students to develop self-assessment. However, a paradigm shift will be required to achieve the kind of environment in dental education that is described above. To begin with, taking responsibility for one's own learning is largely atypical in American education today. Instead, students frequently do only what they need to get by to "pass the test" or "pass the course," while instructors coerce them with the threat of poor grades. Further, traditional pedagogy or teaching in dental education focuses on the ability of students to memorize facts, further reinforcing an environment of dependency—dependence on the teacher to impart information while deemphasizing the responsibility of the students to learn on their own.

Dr. Vimla Patel (2009) has studied clinical reasoning and decision-making processes in health professions education for over 25 years. Patel's findings inform us about best practices for education that promote critical thinking and problem solving which include:

- In-class activity such as writing notes, analyzing problems, or reviewing cases that provide opportunities to apply information being learned
- Use of questions by instructors that require students to analyze problem etiology, compare alternative approaches, provide rationales for plans of action, and predict outcomes
- Frequent in-class quizzing with immediate feedback on response correctness
- Prospective simulations in which students perform decision making for structured and ill-structured problems
- Retrospective critique of cases in which decisions are reviewed to identify errors as well as exemplary performance
- Writing assignments that request students to analyze problems and discuss alternative theories about etiology, compare solutions, and defend decisions about proposed actions
- Analyzing work products to compare how outcomes correspond to the best practice standards, including comparisons of the results of students' reasoning about problems to those of experts

So how do we capture and document these examples of critical thinking, problem solving, and self-directed learning that ultimately demonstrate competence at the end of dental education? In competency-based education, appraisal of competency has been outlined as assessing students' overall competence, or the capacity to "put it all together," defined as "general competence," versus focusing on individual skills, known as component competencies, which are often taught and evaluated in isolation in the disciplinary silos of the curriculum; and employing multiple data

sources based on the principle of triangulation (Lockyer, 2003; Pottinger, 1975). Students' performance can therefore best be assessed as they produce work of their own in an environment that resembles real life, using a repertoire of knowledge and skills. Research has affirmed that the evaluation of competency is best attained through the use of authentic evaluation/assessment (Chambers & Glassman, 1997; Wiggins, 1993).

Portfolios for Cumulative Assessment of Critical Reflection

The use of portfolios is an example of an authentic assessment measure where students are required to document their learning by providing evidence to support claims of skill acquisition.

Portfolios are focused, purposeful collections of student work that document evidence of student learning, progress, and achievement over time. Because they contain longitudinal information, portfolios can be evaluated for degree of improvement (formative assessment) as well as for overall quality (summative assessment). Eraut, in *Professional Knowledge and Competence* (1994), states "Professional competence is more than a demonstration of isolated competencies. When we see the whole, we see its parts differently than when we see them in isolation." Miller (1990), who also has written extensively about assessment in the health sciences, asserts that the collective wisdom of the faculty members who have consistent opportunities to observe and interact with the student is the essential core of performance assessment. Portfolios can provide the venue for capturing this "collective wisdom." Portfolios based on programmatic competencies contain evidence that demonstrates the student's progress toward and attainment of

competency, including longitudinal documentation of patient care, performance on competency exams, case presentations, literature reviews, reports, formative evaluations, and formal performance reviews by supervising faculty. Most importantly, the student's own appraisal, self assessment, and reflection on their performance including needed improvements, lessons learned, and insights about dentistry or the learning process makes known the effectiveness of educational principles and pedagogical practices within dental education. Student reflection is the ultimate demonstration of critical thinking and problem solving as students analyze and assess what these examples of evidence mean in terms of developing competency. Self-reflection requires analysis and synthesis of thought and action, encouraging active involvement and a sense of ownership in the development of the portfolio and of one's own learning.

Although portfolio use dates back to the 1940s in the field of education, the use of portfolios in health science education is a relatively recent phenomenon. Increasingly, health science education and professions have recognized the utility of portfolios for documenting overall general competency. The 2006 accreditation standards for U.S. professional programs in pharmacy stipulate use of portfolios as a principal technique to measure students' attainment of competencies for the doctor of pharmacy degree. Doctoral programs are increasingly turning to portfolios to replace qualifying exams (Wasley, 2008). Even in dentistry, the idea of replacing clinical licensure exams with portfolios has been advocated due to the many ethical dilemmas surrounding clinical licensure exams (Chambers et al, 2004; Gadbury-Amyot et al, 2005; Ranney et al, 2004).

The preceding narrative has provided background as to the rationale for adoption of portfolios as an assessment measure whose time has come in

dentistry. To date, the dental education literature is devoid of research on portfolio assessment of competency other than that published by this author. Gadbury-Amyot's body of research has been able to demonstrate the validity and reliability of portfolio assessment of competency in a dental hygiene education environment (Gadbury-Amyot et al, 2004). In concert with research related to portfolio and performance assessment outside of dentistry, it was found that dental hygiene educators could obtain high inter-rater reliability when it comes to the grading and evaluation of portfolios. Using Messick's unified framework of construct validity to validate performance assessment in the form of portfolios, a strong case for validity was described through both theoretical and empirical evidence.

Thus far, clinical licensure exams have not been shown to be a reliable or valid measure of student success. Yet in spite of the evidence, dentistry continues to support this unscientific approach for gaining entry into the profession. In a study conducted by this author, a disconcerting lack of concordance was found between four validated measures of dental hygiene student competency (overall GPA, Clinic GPA, National Board Exams, and portfolios) and clinical licensure examination scores (Gadbury-Amyot et al, 2005).

Portfolio assessment today also has the advantage of advances in technology. Several methods for developing electronic portfolios, more commonly referred to as "e-portfolios," are present. It is not surprising that the major obstacle to successful implementation of Web-based electronic portfolios is not student readiness, rather the unwillingness of faculty to participate (Gathercoal et al, 2002).

"We have met the enemy...and he is us!" The e-portfolio allows for incorporation of all types of files and formats, including graphics, sound, digital video, text, and other presentation media. The possibilities are virtually limitless when it comes to ways for documenting competency that fit with the way in which the "net generation," the generation that comprises the majority of our student population today, expresses themselves through technology.

Change is a difficult thing and dental education has not been known as an agent for change. However, in the complex healthcare environment where students and graduates now find themselves working, they must develop and rely on critical thinking and problem solving skills in order to successfully navigate and secure their place in the overall healthcare arena. The one thing that is certain in life is change. We can choose to change or become obsolete. It is this author's hope that dental education is paying attention to the national initiatives outlined in this paper. ■

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