



# SHAPING THE FUTURE OF DENTAL EDUCATION:

## **ASSESSMENT IN A GLOBAL CONTEXT**

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# DESCRIPTION

High quality assessment remains a cornerstone of educational practice. With this in mind the workshop sessions will focus on four key areas essential to the effective delivery of a quality assured programme of assessment within a healthcare setting.



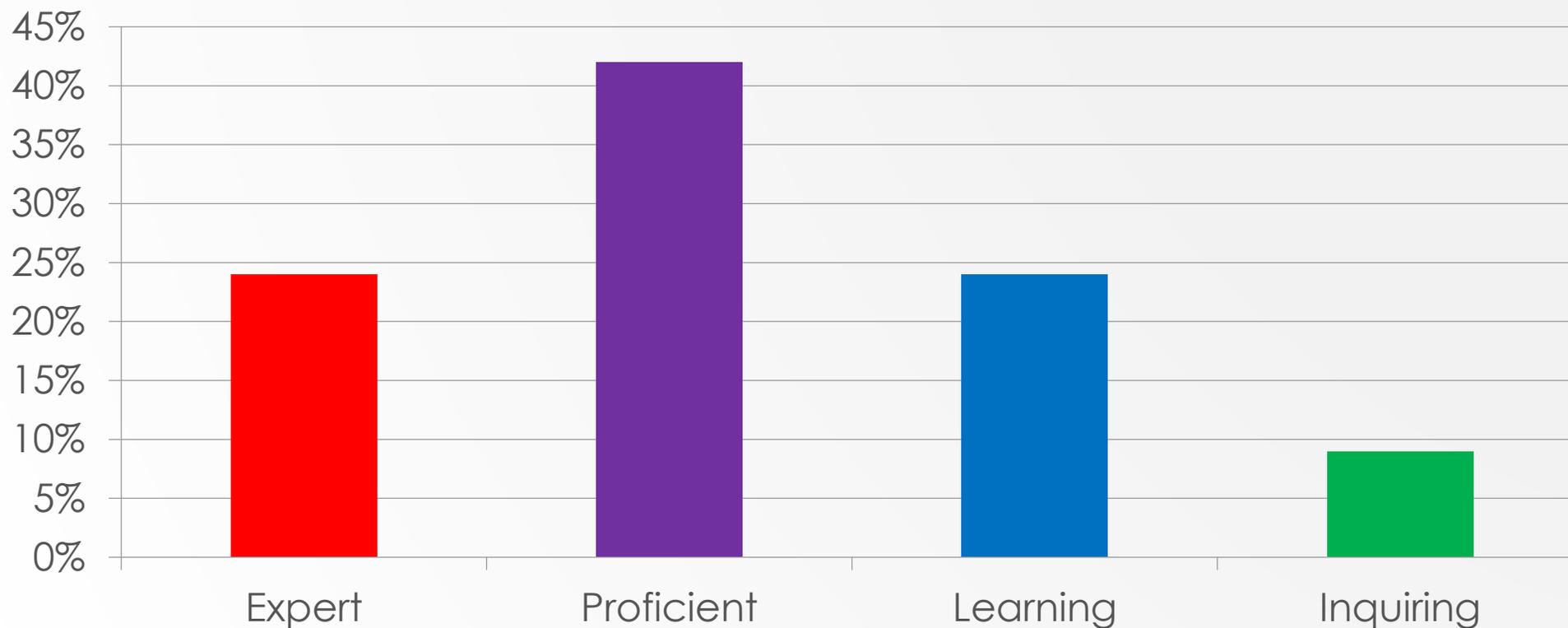
# LEARNING OBJECTIVES

- Selection of appropriate assessment tools
- Selection of appropriate standard setting methods
- Work-based assessment
- How best to assess “soft skills” such as professionalism, leadership and management



# PRE-CONFERENCE SURVEY

Rate knowledge/expertise in assessment



THE VOICE OF  
DENTAL EDUCATION

***"Assessing for learning is a systematic and systemic process of inquiry into what and how well students learn over the progression of their studies and is driven by intellectual curiosity about the efficacy of collective educational practices." – Peggy Maki, Ph.D.***

***"What and how students learn depends to a major extent on how they think they will be assessed" – John Biggs***



# E-PORTFOLIOS AS A GLOBAL/PROGRAMMATIC ASSESSMENT MEASURE FOR CAPTURING STUDENT COMPETENCY

- The literature
  - “...any single assessment has such severe limitations that any single measurement is really no measurement”
  - “Shouldn't we stop trying to optimise everything in a single measure and instead optimise the collection of methods?”
  - “High-stake decisions are taken on many data points and a lot of rich information.” van der Vleuten, 2005, 2016

# WHY EPORTFOLIOS AS PROGRAMMATIC ASSESSMENT IN THE US???

- CBE since 1998 – called for new assessment measures (best practices) that involve student’s reflecting upon their experiences (critical thinking and problem solving)
- CODA revised standards
  - Critical thinking
  - Evidence-based decision making
  - Self Assessment
- California – portfolios for licensure
- ADEA, ADA House of Delegates – all calling for the elimination of human subjects for clinical licensure examinations



# WHY EPORTFOLIOS??

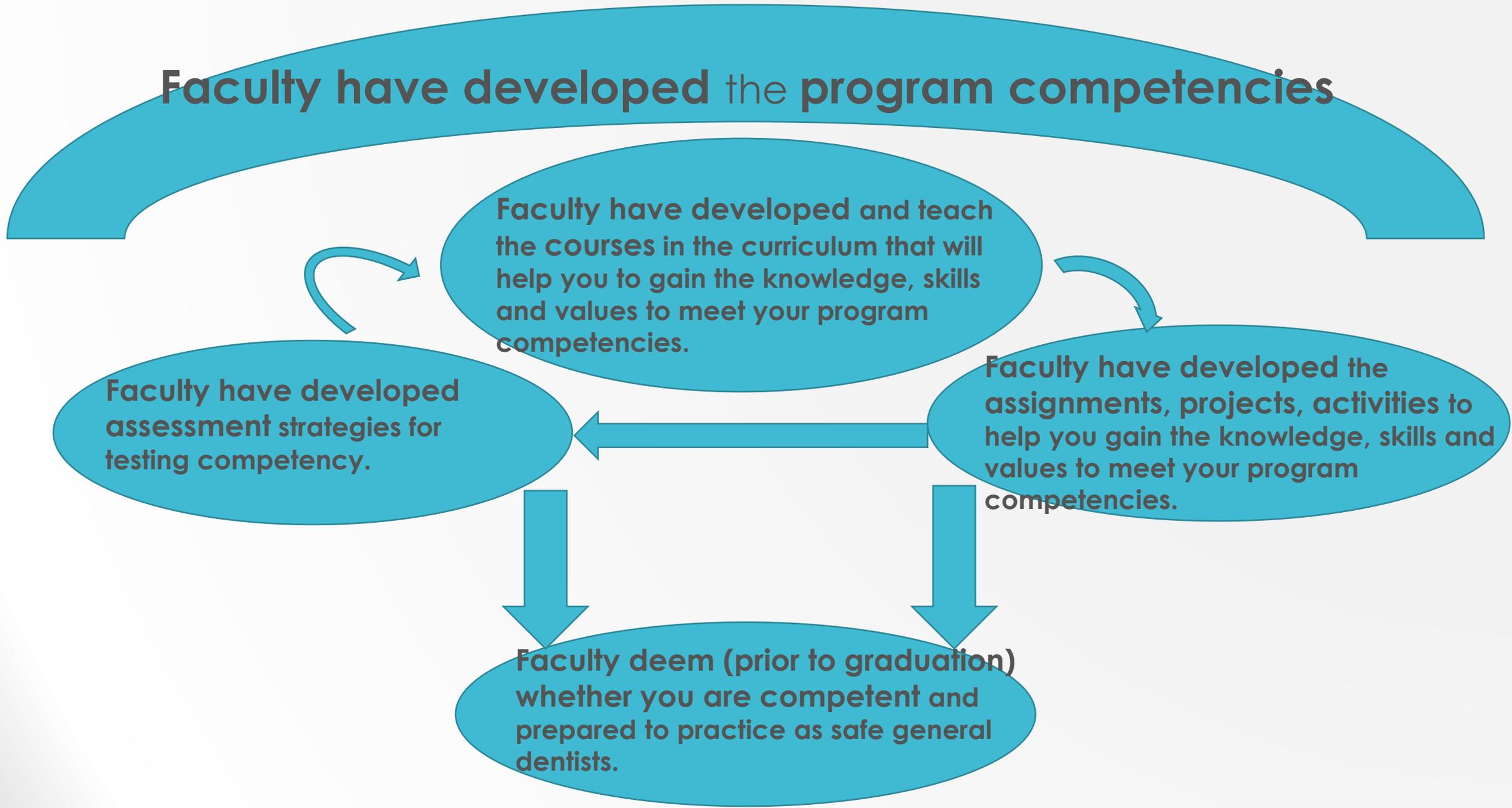
**Faculty have developed** the **program competencies**

Faculty have developed and teach the courses in the curriculum that will help you to gain the knowledge, skills and values to meet your program competencies.

Faculty have developed assessment strategies for testing competency.

Faculty have developed the assignments, projects, activities to help you gain the knowledge, skills and values to meet your program competencies.

Faculty deem (prior to graduation) whether you are competent and prepared to practice as safe general dentists.

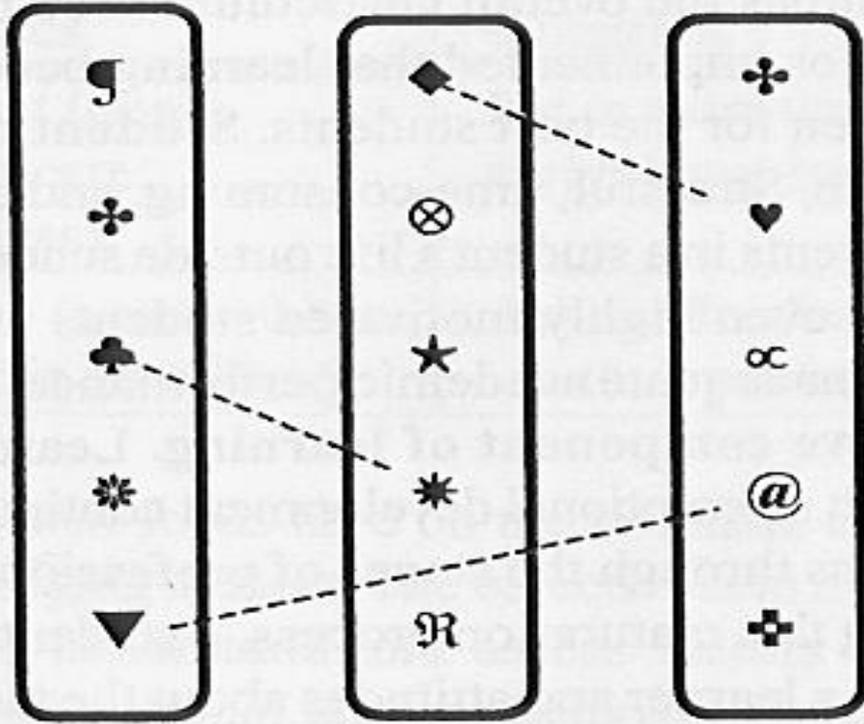


# WHY EPORTFOLIOS

- Development of programmatic student portfolios **challenge students to employ critical thinking and problem solving skills as they construct meaning out of their educational experience** and convey that meaning to others through their portfolios.



## Structure of novices' information

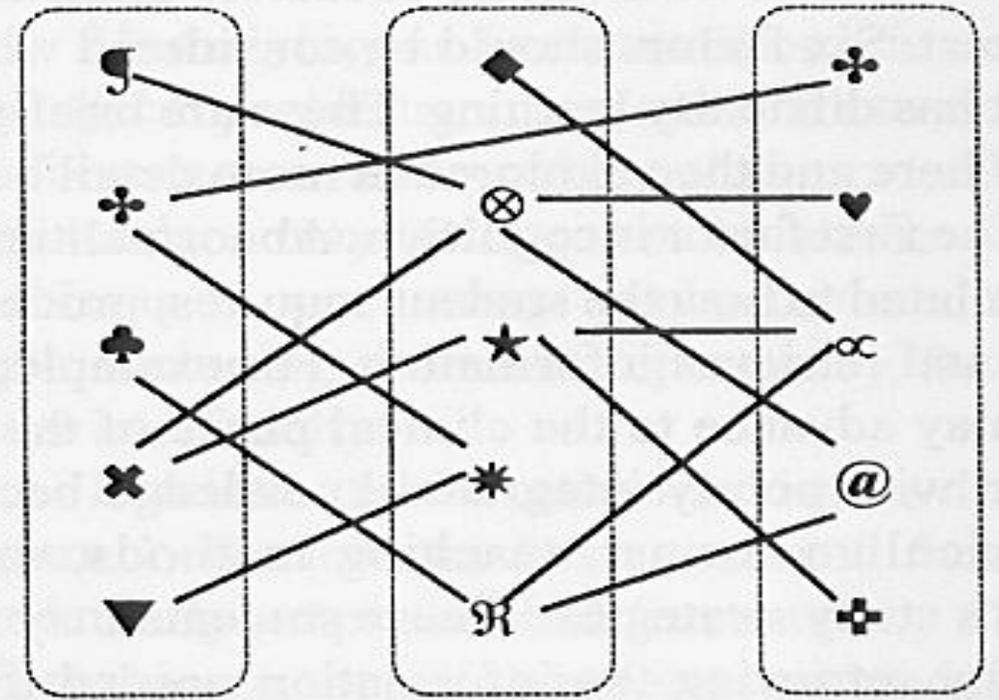


**Vertical - compartmentalized**

Lack of knowledge linkages requires inefficient "trail & error" searching

**Information**

## Structure of experts' information



**Horizontal - networked**

Dense neural networking is needed for rapid information retrieval and problem-solving

**Knowledge**

**COMPETENCY**

# EPSTEIN, 2007

Competence is not an achievement but rather **a habit of lifelong learning**; assessment plays an integral role in helping physicians identify and respond to their own learning needs. Ideally, the assessment of competence (what the student or physician is able to do) should provide insight into actual performance (what he or she does habitually when not observed), as well as the **capacity to adapt to change**, find and generate new knowledge, and **improve overall performance**.

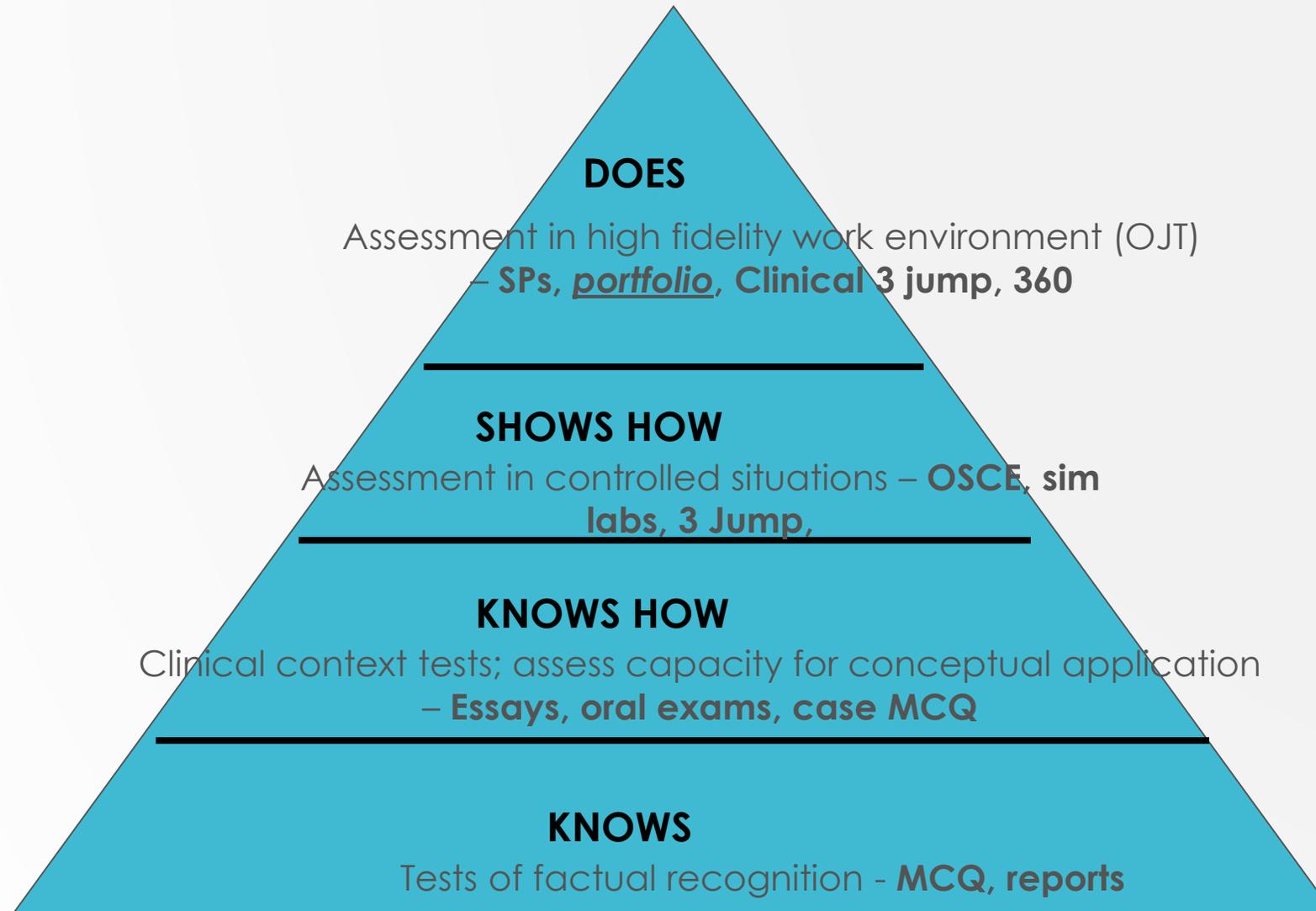


# SELF-DIRECTED LEARNING



- Putting learning in the hands of the student
- Research would tell us that it is in **ACTIVE learning** that we move information from short-term or working memory to long-term memory (Medina, 2005)

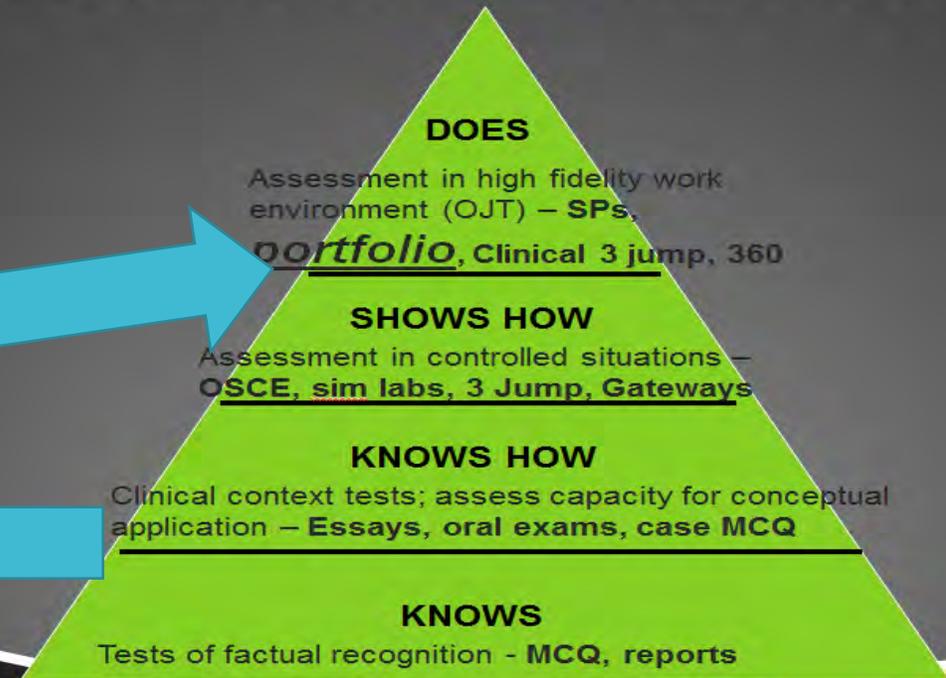
# Miller's Pyramid of Professional Competence



# Shift from traditional testing of knowledge towards “assessment for learning”

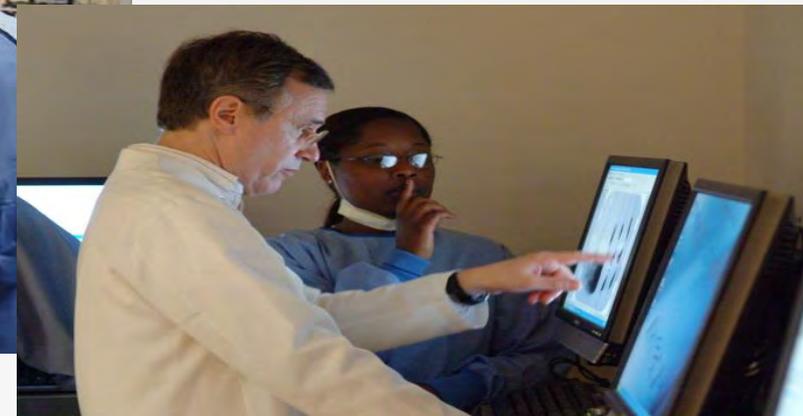


## Miller's Pyramid of Professional Competence



# VALIDITY & RELIABILITY

- Performance measured **over time** by **multiple evaluators**



“Professional competence is more than demonstration of isolated competencies. When we see the whole, we see its parts differently than when we see them in isolation.”

Eraut: *Developing Professional Knowledge and Competence*

# ESTABLISHED EPORTFOLIO PROJECT – UMKC SOD

- Adopted portfolios in all three DH programs in 1998 – transitioned to competency-based portfolios in 2000
  - Based on all program competencies
- Adopted portfolios in predoctoral program in 2013
  - Based on 6/10 program competencies
    - Designed to capture competencies more difficult to assess in traditional manner, e.g., ethics, professionalism (soft skills).....promote self assessment



THE VOICE OF  
DENTAL EDUCATION

# LET'S GO TAKE A LOOK.....



## Categories of ePortfolio Tools

Individual & Institutional			Institutional		
Authoring Tools	Static Web Services	Interactive Web Services	Software - Server required	Hosted Services	Assessment Systems - Hosted Services
<a href="#">Mozilla SeaMonkey</a> Web authoring tools: <a href="#">Apple's iWeb</a> , <a href="#">nVu</a> , <a href="#">Dreamweaver</a> , <a href="#">FrontPage</a> <a href="#">Microsoft Office</a> & <a href="#">Open Office</a> : Word, Powerpoint & <a href="#">Lecshare Pro</a> <a href="#">Adobe Acrobat</a> <a href="#">MovieMaker2</a> , <a href="#">PhotoStory3</a> , <a href="#">iMovie</a> , or any video editing tool	<a href="#">eFolio Minnesota</a> <a href="#">Tripod</a> <a href="#">KEEP Toolkit (through MERLOT)</a> <a href="#">Weebly (includes blog)</a> <a href="#">Yola (includes blog)</a> <a href="#">Screenr.com</a>	<a href="#">WordPress (blog)</a> <a href="#">Blogger</a> <a href="#">WikiSpaces</a> <a href="#">PBworks</a> <a href="#">GoogleDocs</a> <a href="#">Google Sites</a> <a href="#">ZOHIO Writer</a> <b>Mobile tools</b> (for collection and reflection) Mahara (free hosting) <a href="#">foliofor.me</a> or <a href="#">foliospaces</a>	<a href="#">Userland's Manila</a> <a href="#">Blackboard</a> <b>Open Source tools:</b> <a href="#">Elgg</a> , <a href="#">Mahara</a> , <a href="#">OSPI</a> , <a href="#">ePEARL (K-12)</a> Embedded in Moodle: <a href="#">Moofolio</a> , <a href="#">MyStuff (U.K.)</a> Open Source Content Management Systems: <a href="#">Plone</a> , <a href="#">Drupal</a> <a href="#">Microsoft SharePoint</a>	<a href="#">Digication</a> <a href="#">nuVentive's iWebfolio</a> <a href="#">PebblePad (U.K.)</a> <a href="#">Pupil Pages (K.12)</a> <a href="#">Epsilen</a> <a href="#">My eCoach</a> <a href="#">GoogleApps for Education</a>	<a href="#">TaskStream</a> <a href="#">College LiveText</a> <a href="#">Chalk &amp; Wire</a> <a href="#">FolioTek</a> <a href="#">nuVentive's TracDat</a> <a href="#">Richer Picture</a> (Paid add-ons to <a href="#">Digication</a> , <a href="#">Epsilen</a> ) <a href="#">Waypoint Outcomes</a>
These are tools that can be used to author portfolios (offline), but require web server space to publish online. Portfolios created with these tools can also be published on CD-R or DVD-R. No interactivity*	These are static web services that an individual or institution may use to create and publish a presentation portfolio - little or no interactivity* (Web 1.0)	These are dynamic web services that an individual or institution may use to create and publish a presentation portfolio AND allows interactivity* (Web 2.0)	These are systems that an institution would install on their own server to provide space for hosting portfolios. Interactivity* but NO data management system**	These are systems that an institution adopts (no server required) that host portfolios. Usually supports interactivity* but NO data management** or reporting systems	There are hosted systems that an institution would adopt (no server required) that will allow hosting portfolios, facilitates interactivity, and includes a data management** and reporting system for assessment
*Interactivity allows dialogue and feedback in the portfolio, either through comments or collaborative editing <b>Level of Interactivity: Lower &lt; ----- &gt; Higher</b>			**Data management system allows collection of evaluation data about portfolios, and can produce reports aggregating quantitative data		
<b>Level of Personal Expression and Creativity for the Portfolio Developer:</b> <b>Higher &lt; ----- &gt; Lower</b>					

## Dreyfus Model of Progression – A five-stage model of the mental activities involved in directed skill acquisition (1980)

Level 1	<b>Novice</b> Rigid adherence to taught rules or plans Little situational perception No discretionary judgment
Level 2	<b>Advanced Beginner</b> Guidelines for action based on attributes or aspects (aspects are global characteristics of situations, recognizable only after some prior experience) Situational perception still limited All attributes and aspects are treated separately and given equal importance
Level 3	<b>Competent</b> Coping with crowdedness Now sees actions at least partially in terms of longer-term goals Conscious deliberate planning Standardized and routinized procedures
Level 4	<b>Proficient</b> See situations holistically rather than in terms of aspects See what is important in a situation Perceives deviations from the normal pattern Decision-making less labored Uses maxims for guidance, whose meaning varies according to the situation
Level 5	<b>Expert</b> No longer relies on rules, guidelines or maxims Intuitive grasp of situations based on deep tacit understanding Analytic approaches used only in novel situation, when problems occur or when justifying conclusions Vision of what is possible

# PORTFOLIO ASSESSMENT OF STUDENT COMPETENCY



## Assessment

### Validity and Reliability of Portfolio Assessment of Student Competence in Two Dental School Populations: A Four-Year Study

Cynthia C. Gadbury-Amyot, M.S.D.H., Ed.D.; Michael S. McJanet L. Woldt, M.S., Ph.D.; Robert L. Brennan, Ed.D.

**Abstract:** The purpose of this study was to empirically investigate the validity and reliability of dental schools using a unified framework for validity. In the process of validation, it is claimed (interpretations and uses) about test scores that are validated. Kane's argument-based structure for reporting results where validity claims are followed by evidence to support izability theory study found that the greatest source of variance was attributable to faculty ment would benefit from two raters' evaluating each portfolio independently. The result ing, but analytical scoring deserves further research. Correlational analyses between stu dent competence and readiness for licensure resulted in significant correlations betw Examination Part I ( $r=0.323, p<0.01$ ) and Part II scores ( $r=0.268, p<0.05$ ) and small an point average and scores on the Western Regional Examining Board (WREB) exam. It : assessment to determine if the claims and evidence arguments set forth in this study sup g about portfolio assessment in their respective institutions.

Dr. Gadbury-Amyot is Associate Dean and Professor, Instructional Technology and Faculty Development, University of Missouri-Kansas City; Dr. McCracken is Director and Professor, School of Dentistry, University of Alabama at Birmingham; Dr. Woldt is Associate Dean and Associate Professor, Academic Affairs, A.T. Still University; and Dr. Brennan is E.F. Lindquist Chair, Center for Advanced Studies in Measurement and Assessment, University of Iowa. Reprints to Dr. Cynthia C. Gadbury-Amyot, School of Dentistry, University of Missouri-Kansas City, MO 64108; 816-235-2054; amyotc@umkc.edu.

**Keywords:** assessment, portfolio assessment, dental education, competency-based education, problem-solving, self-assessment, multivariate generalizability theory

Submitted for publication 5/30/13; accepted 9/11/13

### Validity and Reliability of Portfolio Assessment of Competency in a Baccalaureate Dental Hygiene Program

Cynthia C. Gadbury-Amyot, Ed.D.; Juhu Kim, Ph.D.; Richard L. Palm, Ed.D.; G. Edward Mills, Ph.D.; Elizabeth Noble, Ph.D.; Pamela R. Overman, Ed.D.

**Abstract:** This study examined the validity and reliability of portfolio assessment using Messick's unified framework of construct validity. Theoretical and empirical evidence was sought for six aspects of construct validity. Seven faculty raters evaluated twenty student portfolios using a primary trait analysis scoring rubric. A significant relationship ( $r = .81, p < .01$ ) between the seven subscales in the scoring rubric demonstrates measurement of a common construct. There was a significant relationship between portfolios and GPA ( $r = .70, p < .01$ ) and the NBDE ( $r = .60, p < .01$ ). The relationship between portfolios and the Central Regional Dental Testing Service (CRDTS) examination was both weak and nonsignificant ( $r = .19, p > .05$ ). A fully crossed, two-factor generalizability (G) study design was used to examine reliability. ANOVA demonstrated that the greatest source of variance was the scoring rubric itself, accounting for 78 percent of the total variance. The smallest source of variance was the interaction between portfolio and rubric (1.15 percent). Faculty rater variance accounted for only 1.28 percent of total variance. A phi coefficient of .86, analogous to a reliability coefficient in classical test theory, was obtained in the decision study by increasing the subscales to fourteen and decreasing faculty raters to three. In conclusion, the pattern of findings from this study suggests that portfolios can serve as a valid and reliable measure for assessing student competency.

Dr. Gadbury-Amyot is Director, Division of Dental Hygiene, University of Missouri-Kansas City; Dr. Kim is Assistant Professor, Counseling, Education Psychology, and Exercise Science, University of Missouri-Kansas City; Dr. Palm is Assistant Professor, Division of Urban Leadership and Policy Studies in Education, University of Missouri-Kansas City; Dr. Mills is Dean, College of Education, Pacific University, Forest Grove, Oregon; Dr. Noble is Associate Professor, Division of Urban Leadership and Policy Studies in Education, University of Missouri-Kansas City; and Dr. Overman is Assistant Dean of Academic Affairs, School of Dentistry, University of Missouri-Kansas City. Direct correspondence and requests for reprints to Dr. Cynthia C. Gadbury-Amyot, Associate Professor and Director, Division of Dental Hygiene, School of Dentistry, University of Missouri-Kansas City, 650 E. 25<sup>th</sup> Street, Kansas City, MO 64108; 816-235-2050 phone; 816-235-2157 fax; amyotc@umkc.edu.

**Key words:** portfolio assessment, validity, reliability, generalizability theory

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Competency has been defined as the skills, understanding, and professional values of an individual ready to begin practicing independently.<sup>1</sup> More specific to dental and allied dental practice, competencies are outcomes of classroom and clinical training combined with experience. In the educational environment, faculty members are tra

Portfolios are a focused purposeful collection of student work that documents evidence of traditional and nontraditional sources of student learning, progress, and achievement over time.<sup>2,3</sup> Because they contain longitudinal information, portfolios can be evaluated for degree of improvement as well as for overall quality. Beyond the presentation of ex

# VALID, RELIABLE, ETHICAL, BEST PRACTICE FOR MEASURING COMPETENCY



# MILLER'S PYRAMID OF PROFESSIONAL COMPETENCE

Miller asserts that “the **collective wisdom** of faculty who have consistent opportunities to observe and interact with the student is the essential core of performance assessment” – a perspective endorsed by virtually every review of assessment best practices in health professions education!!



# FACULTY THAT ARE THE CONTENT EXPERTS



# LESSONS LEARNED.....



# KEZAR, A, 2015

- “.....students often resist new evidence-based teaching approaches [active or collaborative learning, self-assessment, etc.] that require greater engagement and challenge and therefore penalize instructors who use such approaches. Faculty are often given higher evaluations if they do not challenge students to work hard.”



Thank you to our colleagues and hosts  
at Kings College London - Dental  
Institute!!!



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# CHANGE – NOT FOR THE FAINT OF HEART..... THANK YOU!



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