

10-2017

Student Assessment Methods Used in Undergraduate Medical Education

Christine Savi

TCU and UNTHSC School of Medicine, Christine.Savi@fwmdschool.org

Follow this and additional works at: <http://digitalcommons.hsc.unt.edu/md-school>



Part of the [Educational Assessment, Evaluation, and Research Commons](#), and the [Medical Education Commons](#)

Recommended Citation

Savi, Christine, "Student Assessment Methods Used in Undergraduate Medical Education" (2017). *Fort Worth M.D. School*. 1.
<http://digitalcommons.hsc.unt.edu/md-school/1>

This Article is brought to you for free and open access by UNTHSC Scholarly Repository. It has been accepted for inclusion in Fort Worth M.D. School by an authorized administrator of UNTHSC Scholarly Repository. For more information, please contact Tom.Lyons@unthsc.edu.

Student Assessment Methods Used in Undergraduate Medical Education

Method	Strengths	Limitations	Relevant Competency Domains	Use
Authentic Assessment	<ul style="list-style-type: none"> • Highlights relevant topics, themes • Offers real-life application • Is customizable, generalizable • Targets synthesis of concepts • Allows for technology integration 	<ul style="list-style-type: none"> • Can be time-intensive • Requires criteria for evaluation • Requires specific focus • May lack practicality 	<ul style="list-style-type: none"> ✓ Interpersonal and Communication Skills ✓ Interprofessional Collaboration ✓ Professionalism ✓ Patient Care ✓ Knowledge for Practice ✓ Practice-Based Learning and Improvement ✓ Systems-Based Practice ✓ Personal and Professional Development 	Formative Summative
Case presentation	<ul style="list-style-type: none"> • Highlights organizing, prioritizing, and summarizing • Addresses problem-solving and critical thinking • Allows for communication with peers and faculty 	<ul style="list-style-type: none"> • Requires faculty, student training • Requires criteria for evaluation • Can be difficult to standardize case difficulty • May be intimidating for some learners, faculty 	<ul style="list-style-type: none"> ✓ Interpersonal and Communication Skills ✓ Interprofessional Collaboration ✓ Professionalism ✓ Patient Care ✓ Knowledge for Practice ✓ Practice-Based Learning and Improvement ✓ Systems-Based Practice ✓ Personal and Professional Development 	Formative
Chart review	<ul style="list-style-type: none"> • Targets documentation skills 	<ul style="list-style-type: none"> • May contain errors • May be unreadable 	<ul style="list-style-type: none"> ✓ Interpersonal and Communication Skills ✓ Professionalism 	Formative

	<ul style="list-style-type: none"> • Focuses on medical terminology • Provides comprehensive snapshot of patient for review • Focuses on specific aspects 	<ul style="list-style-type: none"> • Offers delayed patient findings • Can be time-consuming 	<ul style="list-style-type: none"> ✓ Patient Care ✓ Knowledge for Practice ✓ Practice-Based Learning and Improvement ✓ Systems-Based Practice 	
<p>Direct observation -</p> <p>By physicians, residents, other health professionals</p>	<ul style="list-style-type: none"> • Offers direct evidence from faculty • Targets skills and behavior • Typically occurs within a clinical setting 	<ul style="list-style-type: none"> • Requires criteria for evaluation • Requires faculty training • Can be time intensive • Relies on patient availability • Requires multiple observations over time • May incur rater bias 	<ul style="list-style-type: none"> ✓ Interpersonal and Communication Skills ✓ Interprofessional Collaboration ✓ Professionalism ✓ Patient Care ✓ Knowledge for Practice ✓ Practice-Based Learning and Improvement ✓ Systems-Based Practice ✓ Personal and Professional Development 	Formative Summative
<p>Direct observation -</p> <p>By standardized patient instructors</p>	<ul style="list-style-type: none"> • Focuses on specific aspects • Offers direct evidence from faculty • Targets skills and behavior • Occurs within a clinical setting • Offers a controlled environment • Can compensate for variations in real patient population 	<ul style="list-style-type: none"> • Requires criteria for evaluation • Requires faculty training • Can be time-intensive • Relies on patient availability • Requires multiple observations over time • Offers a limited presentation of physical symptoms • Can be expensive • May incur rater bias 	<ul style="list-style-type: none"> ✓ Interpersonal and Communication Skills ✓ Interprofessional Collaboration ✓ Professionalism ✓ Patient Care ✓ Knowledge for Practice ✓ Practice-Based Learning and Improvement ✓ Systems-Based Practice ✓ Personal and Professional Development 	Formative Summative

Discussion	<ul style="list-style-type: none"> • Allows for critical thinking, active learning • Permits interprofessional engagement • Can be conducted in-person, online, or a blend 	<ul style="list-style-type: none"> • Requires facilitation to be effective • May be intimidating for some learners, faculty • Can result in unanticipated direction 	<ul style="list-style-type: none"> ✓ Interpersonal and Communication Skills ✓ Interprofessional Collaboration ✓ Professionalism ✓ Practice-Based Learning and Improvement ✓ Personal and Professional Development 	Formative
Interactive computer assessment	<ul style="list-style-type: none"> • Is often self-administered and accessible • Offers automated scoring • Used to target clinical reasoning • Can be archived, revised, and referenced 	<ul style="list-style-type: none"> • Can be difficult to design • Equipment requires set-up • Requires criteria for evaluation • Can be expensive • Limited use targeting skills or behaviors 	<ul style="list-style-type: none"> ✓ Patient Care ✓ Knowledge for Practice ✓ Systems-Based Practice 	Formative
Journal	<ul style="list-style-type: none"> • Used for self-development • Clarifies expectations • Offers student/faculty dialogue • Can target different levels of critical thinking 	<ul style="list-style-type: none"> • Requires prompting to specific focus • Often resisted by students, not perceived as meaningful • Requires alignment to goals or career aspirations • Requires monitoring, review, and feedback • Requires faculty training to provide feedback 	<ul style="list-style-type: none"> ✓ Interpersonal and Communication Skills ✓ Professionalism ✓ Practice-Based Learning and Improvement ✓ Personal and Professional Development 	Formative
Mini-CEX (Clinical Evaluation Exercise)	<ul style="list-style-type: none"> • Can occur in any clinical setting • Offers snapshot of trainee/patient interaction • Targets skills and behaviors 	<ul style="list-style-type: none"> • Requires criteria for evaluation • Requires faculty training • Can be time intensive • Relies on patient availability • May incur rater bias 	<ul style="list-style-type: none"> ✓ Interpersonal and Communication Skills ✓ Interprofessional Collaboration ✓ Professionalism ✓ Patient Care 	Formative

	<ul style="list-style-type: none"> Offers direct evidence from faculty 		<ul style="list-style-type: none"> ✓ Personal and Professional Development ✓ Systems-Based Practice 	
Verbal examination	<ul style="list-style-type: none"> Offers student/faculty interaction Can target different levels of critical thinking Can be archived, revised, and referenced 	<ul style="list-style-type: none"> Requires criteria for evaluation Requires faculty training to develop and score Can be time-intensive Requires vetting, pilot Can be affected communication issues Can be intimidating to students May incur rater bias 	<ul style="list-style-type: none"> ✓ Knowledge for Practice ✓ Interpersonal and Communication Skills 	Formative Summative
OSCE (Objective Structured Clinical Examination)	<ul style="list-style-type: none"> Offers broader sampling of skills/knowledge than a single encounter Focuses on specific aspects Offers direct evidence from faculty, instructors Faculty, instructors are trained Targets skills and behavior Offers a controlled environment Can compensate for variations in real patient population 	<ul style="list-style-type: none"> Requires logistical coordination Requires faculty training to perform and score Requires criteria for evaluation Requires faculty training Can be time-intensive Can be expensive May incur rater bias 	<ul style="list-style-type: none"> ✓ Interpersonal and Communication Skills ✓ Interprofessional Collaboration ✓ Professionalism ✓ Patient Care ✓ Knowledge for Practice ✓ Practice-Based Learning and Improvement ✓ Systems-Based Practice ✓ Personal and Professional Development 	Formative Summative
Peer assessment	<ul style="list-style-type: none"> Targets skills and behaviors Based on interaction and observation Can be used in any team setting 	<ul style="list-style-type: none"> Can be subjective Requires evaluation criteria Students may be reluctant to engage May incur rater bias 	<ul style="list-style-type: none"> ✓ Interpersonal and Communication Skills ✓ Interprofessional Collaboration ✓ Professionalism 	Formative

	<ul style="list-style-type: none"> Encourages student involvement 	<ul style="list-style-type: none"> Requires debriefing by faculty Requires faculty training to deliver feedback 	<ul style="list-style-type: none"> ✓ Practice-Based Learning and Improvement ✓ Personal and Professional Development 	
Portfolio	<ul style="list-style-type: none"> Offers evidence of learning Avails results of multiple assessors Targets skills and behaviors Offers evidence of performance in clinical and non-clinical settings 	<ul style="list-style-type: none"> Can be expensive Requires setup, structure, and access Requires criteria for evaluation Can be storage-intensive 	<ul style="list-style-type: none"> ✓ Interpersonal and Communication Skills ✓ Interprofessional Collaboration ✓ Professionalism ✓ Patient Care ✓ Knowledge for Practice ✓ Practice-Based Learning and Improvement ✓ Systems-Based Practice ✓ Personal and Professional Development 	Summative
Script Concordance Test (SCT)	<ul style="list-style-type: none"> Targets clinical reasoning and ambiguity Offers real-life application Can be replicated 	<ul style="list-style-type: none"> Requires faculty, student training Requires criteria for evaluation Can be difficult to standardize case difficulty 	<ul style="list-style-type: none"> ✓ Knowledge for Practice ✓ Patient Care 	Formative Summative
Self-assessment, reflection	<ul style="list-style-type: none"> Used to gauge self-directed learning Clarifies expectations Offers student/faculty dialogue Can target different levels of critical thinking 	<ul style="list-style-type: none"> Requires prompting to specific focus Often resisted by students, not perceived as meaningful Requires alignment to goals or career aspirations Requires monitoring, review, and feedback 	<ul style="list-style-type: none"> ✓ Interpersonal and Communication Skills ✓ Professionalism ✓ Practice-Based Learning and Improvement ✓ Personal and Professional Development 	Formative

		<ul style="list-style-type: none"> • Requires faculty training to provide feedback 		
Simulation	<ul style="list-style-type: none"> • Offers individual or team interaction • Focuses on specific aspects • Offers direct evidence from faculty, instructors • Faculty, instructors are trained • Targets skills and behavior • Offers a controlled environment • Can compensate for variations in real patient population • Can be archived, revised, and referenced 	<ul style="list-style-type: none"> • Can be difficult to design • Equipment requires set-up • Requires criteria for evaluation • Is expensive • Requires faculty training and student orientation • Is logistically complex • Requires IT integration/support • Requires scheduling for availability as is often in high-demand 	<ul style="list-style-type: none"> ✓ Interpersonal and Communication Skills ✓ Interprofessional Collaboration ✓ Professionalism ✓ Patient Care ✓ Knowledge for Practice ✓ Practice-Based Learning and Improvement ✓ Systems-Based Practice ✓ Personal and Professional Development 	Formative Summative
Small Group Interaction	<ul style="list-style-type: none"> • Allows for critical thinking, active learning • Offers interprofessional engagement • Can be conducted in-person, online, or a blend • Targets specific topics, themes 	<ul style="list-style-type: none"> • Requires facilitation to be effective • May be intimidating for some learners, faculty • Can result in unanticipated direction 	<ul style="list-style-type: none"> ✓ Interpersonal and Communication Skills ✓ Interprofessional Collaboration ✓ Professionalism ✓ Knowledge for Practice ✓ Practice-Based Learning and Improvement ✓ Personal and Professional Development 	Formative
Survey, Questionnaire	<ul style="list-style-type: none"> • Focuses on specific aspects • Offers direct evidence from audience • Is customizable 	<ul style="list-style-type: none"> • Can be time-intensive • Requires vetting, pilot • Requires a minimum number of participants 	<ul style="list-style-type: none"> ✓ Interpersonal and Communication Skills ✓ Professionalism 	Formative

	<ul style="list-style-type: none"> • Allows for technology integration 	<ul style="list-style-type: none"> • Can be logistically challenging 	<ul style="list-style-type: none"> ✓ Practice-Based Learning and Improvement ✓ Personal and Professional Development 	
Written examination- Multiple Choice Questions (MCQ)	<ul style="list-style-type: none"> • Is objective • Is machine gradeable • Can be archived, revised, and referenced • Is easily linked to course objectives • Can target different levels of critical thinking • Focuses on specific aspects 	<ul style="list-style-type: none"> • Requires criteria for evaluation • Requires faculty training to develop and interpret • Can be time-intensive • Can be expensive • Requires vetting, pilot • Can be logistically challenging 	<ul style="list-style-type: none"> ✓ Knowledge for Practice ✓ Patient Care 	Formative Summative
Written examination- Short Answer Questions (SAQ)	<ul style="list-style-type: none"> • Focuses on application, evaluation, and synthesis • Permits diagrams, illustrations, and processes flow representations • Can be machine graded • Focuses on specific aspects • Can be archived, revised, and referenced 	<ul style="list-style-type: none"> • Requires criteria for evaluation • Requires faculty training to develop and score • Can be time-intensive • Can be expensive • Requires vetting, pilot • Can be affected by communication issues • Can be intimidating to students 	Knowledge for Practice Patient Care Interpersonal and Communication Skills	Formative Summative
Written log or Prescription	<ul style="list-style-type: none"> • Targets documentation, notetaking skills • Focuses on medical terminology 	<ul style="list-style-type: none"> • Targets completion • Requires specific focus • Can be time-intensive 	<ul style="list-style-type: none"> ✓ Interpersonal and Communication Skills ✓ Patient Care ✓ Knowledge for Practice 	Formative

Formats

METHOD	STRENGTHS	LIMITATIONS	RELEVANT SOM COMPETENCY DOMAINS	USE
CHECKLIST	<ul style="list-style-type: none"> Used to assess the performance of specific procedures or behaviors Targets completion, repetition Quick, easy to administer 	<ul style="list-style-type: none"> Is susceptible to producing same results across categories Offers limited specific feedback 	<ul style="list-style-type: none"> ✓ Interpersonal and Communication Skills ✓ Interprofessional Collaboration ✓ Professionalism ✓ Patient Care ✓ Knowledge for Practice ✓ Practice-Based Learning and Improvement ✓ Systems-Based Practice ✓ Personal and Professional Development 	Formative Summative
RATING SCALE	<ul style="list-style-type: none"> Used to assess behavior or skills against a benchmark Targets degree of performance 	<ul style="list-style-type: none"> Is susceptible to producing same results across categories Can be confusing if used in conjunction with varied scales Offers limited specific feedback 	<ul style="list-style-type: none"> ✓ Interpersonal and Communication Skills ✓ Interprofessional Collaboration ✓ Professionalism ✓ Patient Care ✓ Knowledge for Practice ✓ Practice-Based Learning and Improvement ✓ Systems-Based Practice ✓ Personal and Professional Development 	Formative Summative
RUBRIC	<ul style="list-style-type: none"> Used to assess behavior or skills against defined criteria 	<ul style="list-style-type: none"> Is time-intensive Requires faculty training to develop and use 	<ul style="list-style-type: none"> ✓ Interpersonal and Communication Skills 	Formative Summative

	<ul style="list-style-type: none"> • Targets quality of performance • Offers defined performance criteria 	<ul style="list-style-type: none"> • Can be verbose and confusing to read • Criteria can overlap and lead to scoring issues 	<ul style="list-style-type: none"> ✓ Interprofessional Collaboration ✓ Professionalism ✓ Patient Care ✓ Knowledge for Practice ✓ Practice-Based Learning and Improvement ✓ Systems-Based Practice ✓ Personal and Professional Development 	
NARRATIVE RESPONSE	<ul style="list-style-type: none"> • Used to clarify performance of behavior, skills • Targets specific aspects of performance • Can offer specific feedback 	<ul style="list-style-type: none"> • Is time-intensive • Requires faculty training in providing feedback • Requires review to score • Can be subjective • Can conflict with quantitative measures • Can be affected by communication issues 	<ul style="list-style-type: none"> ✓ Interpersonal and Communication Skills ✓ Interprofessional Collaboration ✓ Professionalism ✓ Patient Care ✓ Knowledge for Practice ✓ Practice-Based Learning and Improvement ✓ Systems-Based Practice ✓ Personal and Professional Development 	Formative Summative

References:

1. Darling-Hammond L, Snyder J. Authentic assessment of teaching in context. *Teaching and teacher education*. 2000 Jul 31;16(5):523-45.
2. Department of Community and Family Medicine. Program evaluation strategies. Program evaluation strategies. <http://cfmmodules.mc.duke.edu/Curriculum/eval/Progeval.pdf>. Published 1997. Accessed September 28, 2017.
3. Englander R, Cameron T, Ballard AJ, Dodge J, Bull J, Aschenbrener CA. Toward a common taxonomy of competency domains for the health professions and competencies for physicians. *Academic Medicine*. 2013 Aug 1;88(8):1088-94.
4. Epstein RM. Assessment in medical education. *New England Journal of Medicine*. 2007 Jan 25;356(4):387-96.
5. Fournier JP, Demeester A, Charlin B. Script concordance tests: guidelines for construction. *BMC medical informatics and decision making*. 2008 May 6;8(1):18.
6. Haldane T. Portfolios as a method of assessment in medical education. *Gastroenterology and Hepatology from bed to bench*. 2014;7(2):89.
7. Norcini JJ, Blank LL, Arnold GK, Kimball HR. The mini-CEX (clinical evaluation exercise): a preliminary investigation. *Annals of internal medicine*. 1995 Nov 15;123(10):795-9.