



Programmatic Assessment in a Remote World: Using Technology & Evidence in Athletic Training & Therapy Education



Paul R. Geisler, EdD, ATC
Professor & Director, AT Education
Ithaca College, NY, USA



Disclosures & Conflicts of Interest

I hereby confirm I have NO conflicts of interest, NOR anything to disclose.

The content and information presented herein are free from conflicts of interest and do not represent the views of the WFATT or the NATA.



Today's Learning Objectives

At the conclusion of today's webinar, participants will...

...appreciate *capability* as an appropriate assessment intention

...know fundamental differences between formative and summative assessment

...understand "Assessment AS Learning"

...appreciate role for intentional progress testing

...conceptualize programmatic assessment = continuous quality improvement

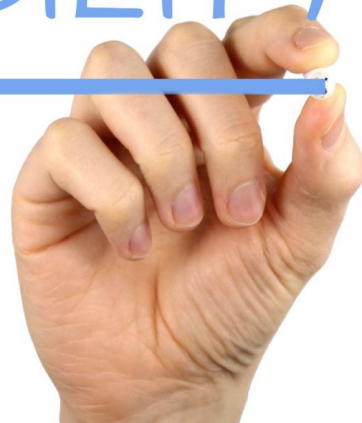
...understand utility of virtual assessment modules for Assessment AS Learning



Quick Strike Poll Q#s 1-3



CAPABILITY





Competency vs. Capability

Competency

“What individuals know or are able to do in terms of knowledge, skills and attitude...safe, structured, static, highly supervised and very prescriptive in nature with detailed components and levels. Often boiled down to checklists and predictable, linear demonstrations of learning.”

Fraser & Greenhalgh, *BMJ*, 2001

Capability

“...all around integration of knowledge, skills, personal qualities and understanding used appropriately and effectively”

Stephenson, 1998

“Education for capability must focus on process (supporting students to construct own learning goals, receive FB, reflect and organize knowledge and experience) and avoid goals with rigid and prescriptive content.”

Fraser & Greenhalgh, *BMJ*, 2001



Educating for *Capability*

“In today’s complex world, we must not educate merely for competence, but for capability—the ability to adapt to change, generate new knowledge, and continuous performance enhancement”



Fraser & Greenhalgh
Coping with Complexity: Educating for
Capability.

BMJ, 2001;323:799-803.



**KEEP
CALM
AND
TAKE A
META-MOMENT**

KeepCalmAndPosters.com



Programmatic Assessment in AT Webinar, PR Geisler, May 26, 2020



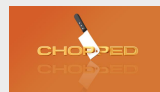
Medical Education 2016; 50: 610–611
doi: 10.1111/medu.12956



when i say

When I say . . . capability

Hilary Nave & Sally Hanks



"...**capability** challenges us to rethink the **linear learning outcome** model, as well as our **assessment** methods. We need to find ways of assessing students' performance, including their **ability** to **problem solve in complex clinical situations**, in which the **interaction** of **several competencies** may be more important than a series of **separate assessments of task-specific competencies**. This will require **meaningful** assessment **tools** and **standards** that reflect the **real** world and the student's **ability** to **integrate** and **transfer** his/her learning to **new settings**. Perhaps we should even evaluate students' ability to **cope** under **stress** and to **adapt** and to **innovate**."

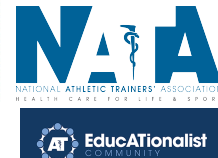
Macro Program Outcomes Ithaca College Program Goals

Ithaca College Athletic Training Education Program Learning Objectives, Updated spring 2020

Ithaca College Athletic Training Graduates Will Demonstrate Clinical Capabilities Expected of Entry-Level Practice in the Following Integrated Domains of Practice:

1. **Evidence-Based Practice (EBP)**—graduates will be CAPABLE of effectively seeking, appraising, implementing and creating evidence germane to the scope of clinical athletic training practice, in consideration of patient and sociocultural contexts and clinical levels of clinical expertise and as a function of diagnostic, therapeutic and managerial reasoning responsibilities
2. **Prevention & Health Promotion (PHP)**—graduates will be CAPABLE of educating, communicating, and counseling athletic and active populations concerning the prevention, management and care of common injuries, illnesses and conditions related to human performance and general wellness using appropriate evidence-informed principles & practices, and in consideration of relevant sociocultural determinants of health and wellness.
3. **Diagnostic Reasoning & Management (DxRM-O)—Orthopedic**—graduates will be CAPABLE of reducing, recognizing, evaluating, managing and referring emergent, acute and life-threatening musculoskeletal conditions in active patient populations using appropriate evidence-informed principles & practices; and when appropriate, with respect to expected benchmarks for interprofessional practice.
4. **Diagnostic Reasoning & Management (DxRM-GM)—General Medical**—graduates will be CAPABLE of recognizing, evaluating, and treating, common acute and chronic musculoskeletal conditions and injuries in active patient populations using appropriate evidence-informed principles & practices, including appropriate documentation standards for and towards the purpose of establishing evidence-informed and pt. centered intervention plans; and when appropriate, with respect to expected benchmarks for interprofessional practice and referral.
5. **Acute Care of Injury & Illness (ACI)**—graduates will be CAPABLE of recognizing, evaluating, treating and referring common and problematic urgent and/or life threatening conditions and injuries in active patient populations using appropriate evidence-informed principles & practices, including appropriate documentation standards for and towards the purpose of establishing evidence-informed and pt. centered intervention plans; and when appropriate, with respect to expected benchmarks for interprofessional practice and referral.
6. **Therapeutic Reasoning & Interventions (TRI)**—graduates will be CAPABLE of designing, choosing, implementing, and evaluating effective, safe, functional and integrated therapeutic intervention programs in active patient populations using appropriate evidence-informed and pt. centered principles & practices; and when appropriate, with respect to expected benchmarks for interprofessional practice and referral.
7. **Psychosocial Strategies & Referral (PSR)**—graduates will be CAPABLE of recognizing, managing and referring common mental health and psychosocial conditions in active patient populations using appropriate evidence-informed, theories, principles & practices, and when appropriate, with respect to expected benchmarks for interprofessional practice and referral.
8. **Healthcare Administration & Organization (HAO)**—graduates will be CAPABLE of communicating, documenting, leading, and administering athletic training related healthcare services, facilities and provisions for active patient populations using appropriate evidence-informed principles & practices and CQI.
9. **Professional Development, Behaviors & Responsibilities (PDR)**—graduates will be CAPABLE of performing the required interconnected and interprofessional duties and responsibilities of the entry-level professional athletic trainer with efficiency, conviction, character, confidence and patient centered compassion, in part by displaying all NATA Foundational Behaviors of Professional Practice.

Programmatic Assessment in AT Webinar, PR Geisler, May 26, 2020



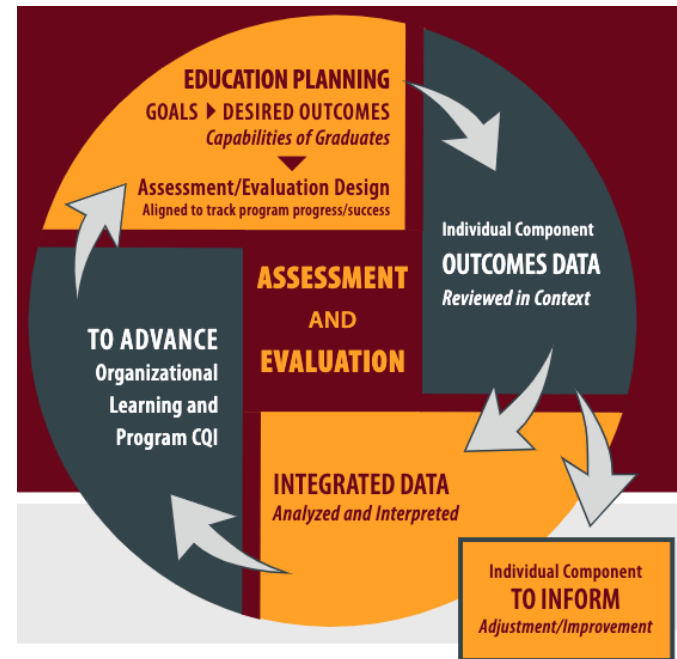
Systematic Programmatic Assessment

Harvard Macy Institute
harvardmacy.org

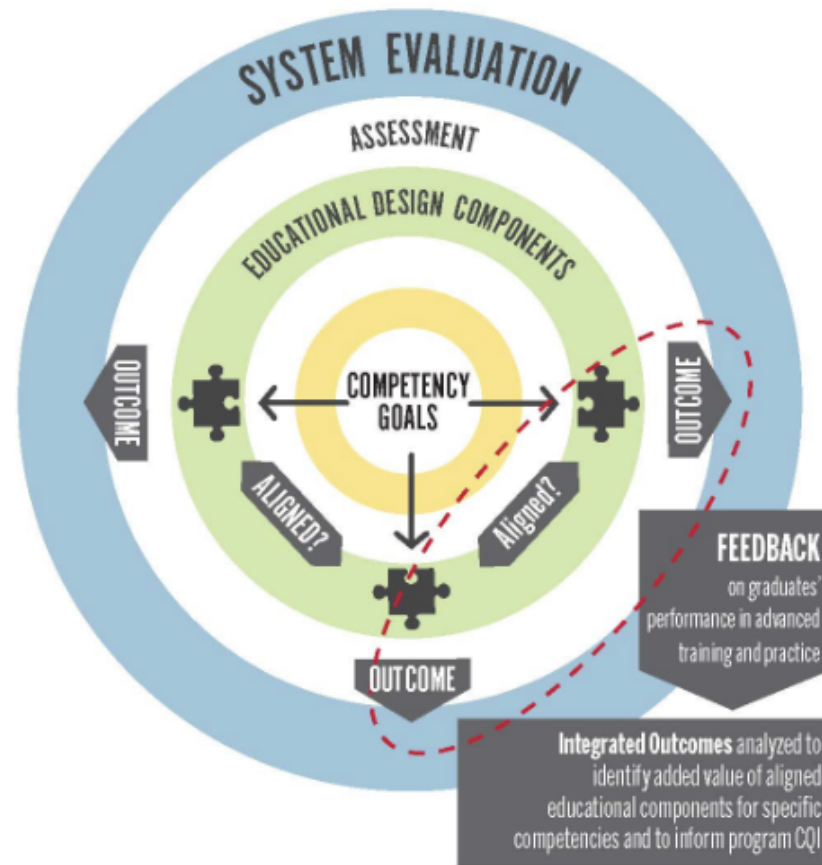


HARVARD
MEDICAL SCHOOL

Professional Development Programs
for Academic Leaders in Health Care



Systematic Programmatic Assessment





Quick Strike Poll Qs# 4-5

Formative Assessment (aka, "assessment FOR learning")



Formative Assessment

for·ma·tive as·sess·ment
/fôrmədīv//əsəsmənt/

The evaluation of student learning while the learning is still taking place.



**KEEP
CALM
AND
TAKE A
META-MOMENT**

KeepCalmAndPosters.com

No Stakes, Low Stakes,
Informal/Formal,
Deliberate, Progress
Driven,
Specific, Local,
Contextual, Feedback



Programmatic Assessment in AT Webinar, PR Geisler, May 26, 2020



Summative Assessment (aka, "assessment OF learning")

© 2009 Kevin Spear kevin@kevinspear.com www.kevinspear.com



"If I do this test with one eye closed, one hand tied behind my back and hopping on one foot, do I get an A for effort?"

Summative Assessment

sum·ma·tive as·sess·ment

The practice of evaluating what a student has learned at the end of a given period of time (assessment of learning).



**KEEP
CALM
AND
TAKE A
META-MOMENT**

KeepCalmAndPosters.com

High Stakes, Less
Frequent, Time
Consuming,

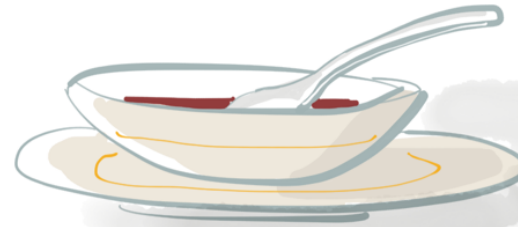
Grades, Rubrics, Low-
No FB, Benchmarks,
Pass/Fail, Outcomes



FORMATIVE SUMMATIVE



WHEN THE **CHEF**
TASTES THE SOUP



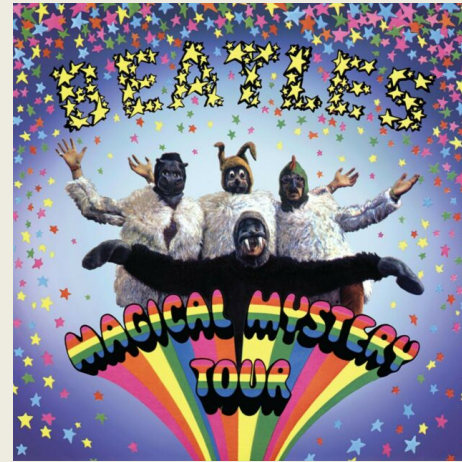
WHEN THE **GUESTS**
TASTE THE SOUP

@bryanMMathers

FROM STEVE WHEELER'S BLOG "THE AFL TRUTH ABOUT ASSESSMENT"



Formative Assessment (aka, "assessment FOR learning")



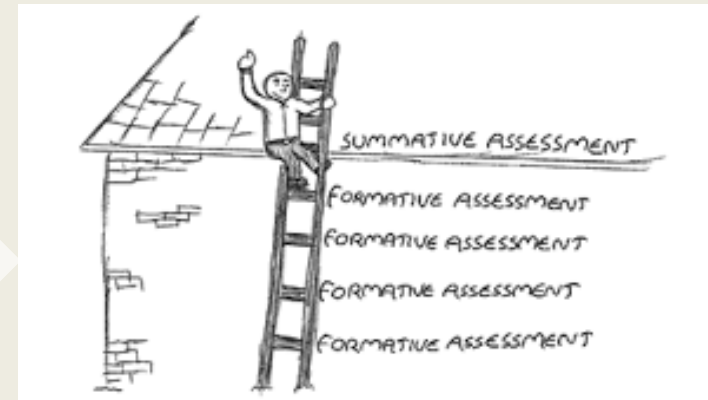
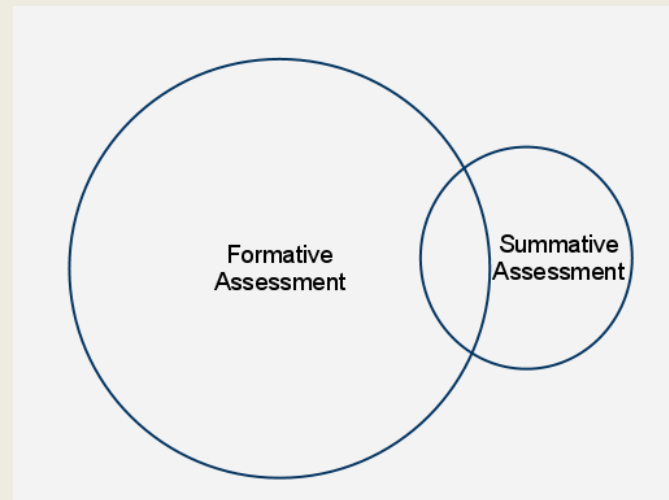


Programmatic Assessment: Create *A Guided Tour* to a *Desired Destination*

Programmatic Assessment in AT Webinar, PR Geisler, May 26, 2020

Programmatic Assessment

"...incorporates both assessment for learning and assessment of learning"





KEY NOTE LECTURE

A Programmatic Approach to Assessment

Cees P.M. van der Vleuten¹

Published online: 21 November 2016
© International Association of Medical Science Educators 2016

It is relatively easy to demonstrate that any individual single assessment in whatever format has severe limitations. In an easy to quantify area such as reliability, it is quite clear from many studies that substantial testing time and a lot of sampling is needed to achieve reliable scores, irrespective of the method being used. Most of our assessments in actual practice are unreliable. In a much more difficult area—how assessment influences learning—it is quite clear that much of our assessment is rather reductionist. Sometimes very poor learning strategies are reinforced (i.e., cognitive and behavioral rote learning), often opposing the intent of the curriculum. There is also very little information value in common assessment practices. We often limit the information to grades or to other quantitative information with little richness and therefore limited learning value. Our predominant system of assessment is to complete every modular element of a curriculum with an assessment. We hardly look at how a learner develops over time. Mastery of every element implicitly assumes mastery of the whole. In a similarly difficult area of validity, it is quite clear that any method of assessment is just a snap shot of what we wish or could assess with an individual learner. In all, trying to optimize everything in a single method of assessment at a single moment of time is doomed to fail. This notion is the basis for optimizing the assessment program as a whole.

In a programmatic approach to assessment, each individual assessment is seen as a single data point that provides only limited information on a learner. Given this limited information, we should optimize the assessment differently. Individual

data points are not very suitable for high stake decisions. But they are suitable for giving feedback to the learner. In programmatic assessment, pass/fail decisions are removed from the individual assessment and the focus is on feedback. The feedback may be quantitative (in scores) or qualitative (in words) in nature all depending on the method of assessment. The more complex the skill we are assessing the more meaningful qualitative information will be. So individual data points are optimized for their learning value and richness of information, not for decision-making on learner progress. The decision-making can only be done with confidence when sufficient data points have been gathered. For decisions on learner progress, other optimization strategies are in order. The stake of the decision is related to the number of data points needed. Very high stake decisions, for example promotion to the next year, should be based on many data points. Lower stake decisions—i.e., an intermediate judgment on learner progress—may have fewer data points. High stake decisions are made robust through all kinds of safe guards in the decision-making process. Usually decision-making is done by a committee. Amount of deliberation is depending on the clarity of the information. Earlier feedback cycles will limit the surprise element of decisions being taken. A justification to the decision-making will make it more acceptable. The size of committee and independence of committee members will contribute to the credibility of the judgment being made. All these elements of due process make the decision-making robust. Finally, better learning is promoted by mentoring. From the reflection and feedback literature, we know that learners need to be supported in using feedback to guide their learning. Therefore, in a programmatic assessment approach, mentors are used to guide and coach the learner longitudinally. Mentors also play a role in defining remediation activities that may be needed as a result of the incoming learning and assessment information.

✉ Cees P.M. van der Vleuten
c.vandervleuten@maastrichtuniversity.nl

¹ Maastricht University, Maastricht, The Netherlands

“Our current culture is a predominantly summative one with assessment as the constituent **hurdles**. In programmatic assessment, a **learning oriented view** is the **predominant culture**. The summative orientation to assessment fits to a classic “**mastery oriented**” or **behaviorist view** on education, whereas the programmatic assessment view fits to a more **constructivist view** on education. Competency-based education...strongly resonates with programmatic assessment.”

Systematic Programmatic Assessment

Perspective

Focusing on the Formative: Building an Assessment System Aimed at Student Growth and Development

Lyuba Konopasek, MD, John Norcini, PhD, and Edward Krupat, PhD

Abstract

This Perspective addresses the need for an integrated system of formative and summative assessment in undergraduate medical education with a focus on the formative. While acknowledging the importance of summative assessment, which asks whether trainees have met criteria for progression, the authors propose that a formatively focused assessment system can best accomplish a central task of competency-based medical education: transmitting feedback to learners in a format and a manner that will help them to improve, develop, and grow. Formative assessment should not

be seen as a set of singular events but, rather, as a process that is organized and integrated over time, much like the cycle of quality improvement in medicine. To justify this position, the authors discuss its conceptual underpinnings and rationale, including the need to prepare learners for the formatively focused assessment system of graduate medical education. Next, the authors identify assessment strategies that could be employed, as well as the characteristics of an institutional culture and the learner-teacher relationship necessary for a learner-centered, improvement-focused assessment system

to succeed. Finally, an infrastructure for such a system is proposed. This consists of a foundation of well-articulated and disseminated milestones for achievement and four pillars: faculty development, learner development, longitudinal academic advising and coaching, and documentation of developing competence. The authors conclude by suggesting that the guidelines propose are analogous to the principles of continuity and coordination of care, so much valued in the world of medicine yet often overlooked in the world of education.

Student assessment involves balancing assessment aimed at making decisions about students and their progression (summative assessment) with assessment that provides students with feedback to enhance their learning (formative assessment). Formative assessment is performed in the spirit of "assessment for learning" rather than "assessment of learning."¹ By providing feedback and guidance to students, formative assessment has positive effects on learning and performance.^{2,3} It is an essential element of self-regulated learning^{4,5} and informed self-assessment.⁶ When done thoughtfully, it can be a catalyst for growth and development.^{1,7}

L. Konopasek is designated institutional official, NewYork-Presbyterian Hospital and associate professor of pediatrics, Weill Cornell Medicine, New York, New York.

J. Norcini is president and chief executive officer, Foundation for Advancement of International Medical Education and Research, Philadelphia, Pennsylvania.

E. Krupat is director, Center for Evaluation, Harvard Medical School, Boston, Massachusetts.

Correspondence should be addressed to Lyuba Konopasek, NewYork-Presbyterian Hospital, Box 312, 525 E. 68th St., New York, NY 10021; telephone: (212) 746-4055; e-mail: Lyk2003@nyp.org.

Acad Med. 2016;91:1492-1497.
First published online March 29, 2016
doi: 10.1097/ACM.00000000000001171

reducing uncertainty and leading to more focused and efficient gains in skill and knowledge.⁸

Summative assessments typically occur at the end of a program or an experience and translate into a score or grade, allowing educators to compare learners and to determine whether they know enough and demonstrate competence to progress. However, when practicing summative assessment, we are acting far more as *regulators* than *educators*. Although summative assessment is certainly necessary, our assessment focus must be far broader. The *educator's* role, accomplished via formative assessment, is to impart information, instill values, and inspire excellence and ongoing learning.

Formative Assessment in Light of Current Educational Trends

Self-regulated, lifelong learning; learner-centered curricula; and a focus on learning outcomes through competency-based assessments have been prominent themes in the curricular reform movement in medical education over the past decade.^{9,10} Competency-based assessment that links learning outcomes with specific learning objectives requires continuous and frequent assessment.^{11,12} Actively engaging the learner, through

activities such as self-directed assessment seeking behavior,¹³ in which students actively seek feedback on performance for the purpose of improvement, is considered an essential component of competency-based medical education. An assessment system that enables teachers to assist students in developing and achieving their learning goals is a vital component of a learner-centered curriculum, which addresses the need of millennial learners, many of whom engage in independent, asynchronous learning.

The Case for a Formatively Focused Assessment System in Undergraduate Medical Education

The Liaison Committee on Medical Education (LCME) has mandated formative assessment as a requirement in undergraduate medical education (UME) through clerkship and/or midcourse feedback to students for remediation purposes.¹⁴ To serve as a critical contributor to medical student education, however, formative assessment must be at the heart of their training, not just included to satisfy accreditation requirements or to ensure that every passes. Unlike other professional training cultures such as music and sports, in which feedback is expected, respected

List 1

Institutional Characteristics of a Formatively Focused Assessment System

Institutionally, a formative assessment system should:

- Be organized, integrated, and comprehensive, having the characteristics of a coordinated and unified system.
- Be complementary to the summative assessment system. In mapping a system, educators should consider purpose and optimal use of formative and summative elements.
- Provide data and feedback in many different forms from a variety of sources.
- Have both central stewardship and local accountability. A designee of the medical school should oversee both formative and summative assessment systems to ensure that both assessment functions are serving to complement one another.
- Be seen as a continuous process over the learner's entire tenure and implemented at multiple points in time.
- Include systemic collection and utilization of assessment data so that feedback and improvement discussions become part of a team effort rather than a private transfer of information between learner and teacher.
- Place responsibility for improvement on both learner and teacher, and hold both accountable for seeking and monitoring progress.
- Include learner sessions on how to effectively seek, receive, and use feedback.
- Include faculty development sessions so that teachers can learn how to engage as coaches, using appropriate motivational techniques to encourage self-improvement in learners.



Systematic Programmatic Assessment

Perspective

Focusing on the Formative: Building an Assessment System Aimed at Student Growth and Development

Lyuba Konopasek, MD, John Norcini, PhD, and Edward Krupat, PhD

Abstract

This Perspective addresses the need for an integrated system of formative and summative assessment in undergraduate medical education with a focus on the formative. While acknowledging the importance of summative assessment, which asks whether trainees have met criteria for progression, the authors propose that a formatively focused assessment system can best accomplish a central task of competency-based medical education: transmitting feedback to learners in a format and a manner that will help them to improve, develop, and grow. Formative assessment should not

be seen as a set of singular events but, rather, as a process that is organized and integrated over time, much like the cycle of quality improvement in medicine. To justify this position, the authors discuss its conceptual underpinnings and rationale, including the need to prepare learners for the formatively focused assessment system of graduate medical education. Next, the authors identify assessment strategies that could be employed, as well as the characteristics of an institutional culture and the learner-teacher relationship necessary for a learner-centered, improvement-focused assessment system

to succeed. Finally, an infrastructure for such a system is proposed. This consists of a foundation of well-articulated and disseminated milestones for achievement and four pillars: faculty development, learner development, longitudinal academic advising and coaching, and documentation of developing competence. The authors conclude by suggesting that the guidelines proposed are analogous to the principles of continuity and coordination of care, so much valued in the world of medicine yet often overlooked in the world of education.

Student assessment involves balancing assessment aimed at making decisions about students and their progression (summative assessment) with assessment that provides students with feedback to enhance their learning (formative assessment). Formative assessment is performed in the spirit of “assessment for learning” rather than “assessment of learning.”¹ By providing feedback and guidance to students, formative assessment has positive effects on learning and performance.^{2,3} It is an essential element of self-regulated learning^{4,5} and informed self-assessment.⁶ When done thoughtfully, it can be a catalyst for growth and development.^{1,7}

reducing uncertainty and leading to more focused and efficient gains in skill and knowledge.⁸

Summative assessments typically occur at the end of a program or an experience and translate into a score or grade, allowing educators to compare learners and to determine whether they know enough and demonstrate competence to progress. However, when practicing summative assessment, we are acting far more as *regulators* than *educators*. Although summative assessment is certainly necessary, our assessment focus must be far broader. The *educator's role*, accomplished via formative assessment, is to impart information, instill values, and inspire excellence and ongoing learning.

Formative Assessment in Light of Current Educational Trends

Self-regulated, lifelong learning; learner-centered curricula; and a focus on learning outcomes through competency-based assessments have been prominent themes in the curricular reform movement in medical education over the past decade.^{9,10} Competency-based assessment that links learning outcomes with specific learning objectives requires continuous and frequent assessment.^{11,12} Actively engaging the learner, through

activities such as self-directed assessment seeking behavior,¹³ in which students actively seek feedback on performance for the purpose of improvement, is considered an essential component of competency-based medical education. An assessment system that enables teachers to assist students in developing and achieving their learning goals is a vital component of a learner-centered curriculum, which addresses the need of millennial learners, many of whom engage in independent, asynchronous learning.

The Case for a Formatively Focused Assessment System in Undergraduate Medical Education

The Liaison Committee on Medical Education (LCME) has mandated formative assessment as a requirement in undergraduate medical education (UME) through midclerkship and/or midcourse feedback to students for remediation purposes.¹⁴ To serve as a critical contributor to medical student education, however, formative assessment must be at the heart of their training, not just included to satisfy accreditation requirements or to ensure that every student passes. Unlike other professional training cultures such as music and sports, in which feedback is expected, respected

List 2

Learner-Teacher Relationship in a Formatively Focused Assessment System

Interpersonally, the nature of the student-teacher relationship in a formative assessment system should:

- Be developmental. Markers or milestones must be laid out for both assessors and students so that they have a sense of the proper expectations and faculty can communicate how the student may reach the next level.
- Be learner centered. Assessment methods should relate to the student's learning goals, and the student's performance should be related to external measures of performance.
- Be improvement focused. Learners should be encouraged to work constantly towards continuous improvement and aspire to excellence rather than accepting a test score, even minimal competence, and then moving on to a new subject.
- Encourage student self-reflection. Students should be encouraged to take responsibility for assessing their own performance so as to improve skills in self-assessment and internalize skills for using feedback to improve performance.
- Draw on a broad range of assessment data, which encourage exploration of the learner's thinking process and multiple dimensions of performance.
- Involve regularly scheduled feedback to the learner to close the loop. Feedback must be regularly scheduled rather than exclusively “on-the-fly,” and be substantive and specific to motivate the learner to continue improving.
- Encourage relationship building. Feedback should be given face to face, with a coaching focus so as to strengthen the bond between learner and teacher.
- Include follow-up to ensure that the learner is accountable for continuing to work on performance issues.
- Provide learners with directions and resources to improve, rather than just vague encouragement, and encourage the learners to identify their own strategies for improvement.
- Promote teacher self-reflection on the nature of the feedback conversation and ways of making it more effective.

Academic Medicine, Vol. 91, No. 11 / November 2016

L. Konopasek is designated institutional official, NewYork-Presbyterian Hospital and associate professor of pediatrics, Weill Cornell Medicine, New York, New York.

J. Norcini is president and chief executive officer, Foundation for Advancement of International Medical Education and Research, Philadelphia, Pennsylvania.

E. Krupat is director, Center for Evaluation, Harvard Medical School, Boston, Massachusetts.

Correspondence should be addressed to Lyuba Konopasek, NewYork-Presbyterian Hospital, Box 312, 525 E. 68th St., New York, NY 10021; telephone: (212) 746-4055; e-mail: Lyk2003@nyp.org.

Acad Med. 2016;91:1492-1497.
First published online March 29, 2016
doi: 10.1097/ACM.00000000000001171

Assessment AS Learning

Chapter 28 Competence Assessment as Learner Support in Education

Cees van der Vleuten, Dominique Sluijsmans,
and Desirée Joosten-ten Brinke

28.1 Introduction

The assessment of professional competence has developed progressively in the last decades following the changes occurring in education. Education has shifted from an input model of education to an outcome-based model of education (Chappell et al. 2000). Instead of requiring certain hours in a curriculum on certain disciplines (the input model), modern education programmes are based on a defined set of outcomes or competencies (the output model). All courses and the assessment are then aligned to these outcomes. A second major shift is that many of these outcomes or competencies move beyond the knowledge domain, into more authentic professional skills or general competencies relevant for success in the labour market (Semeijn et al. 2006). Being able to work in a team, being able to communicate, being able to write academically and being able to behave professionally are examples of these general competencies. They are less domain specific, hence their general or generic nature. Both success and failure in the labour market are associated with these kinds of skills (Heijke and Meng 2006). As a result modern curricula pay more attention to the development of these skills. Finally, a third major change is a didactical one, where education is moving from atomistic to holistic learning, from teacher-centred learning to student-centred learning, from an exclusive focus on

C. van der Vleuten (✉)
Maastricht University, Maastricht, Netherlands
e-mail: c.vandervleuten@maastrichtuniversity.com

D. Sluijsmans
Zuyd University of Applied Sciences, Heerlen, Netherlands

D. Joosten-ten Brinke
Open University in the Netherlands, Heerlen, The Netherlands
Fontys University of Applied Sciences, Eindhoven, The Netherlands

© Springer International Publishing Switzerland 2017
M. Mulder (ed.), *Competence-based Vocational and Professional Education*,
Technical and Vocational Education and Training: Issues, Concerns and
Prospects 23, DOI 10.1007/978-3-319-41713-4_28

607

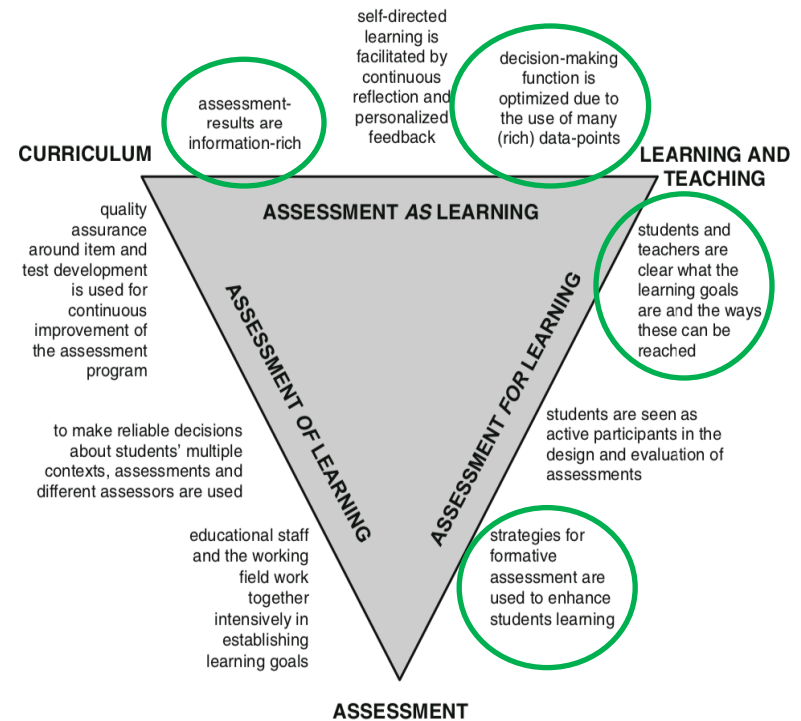


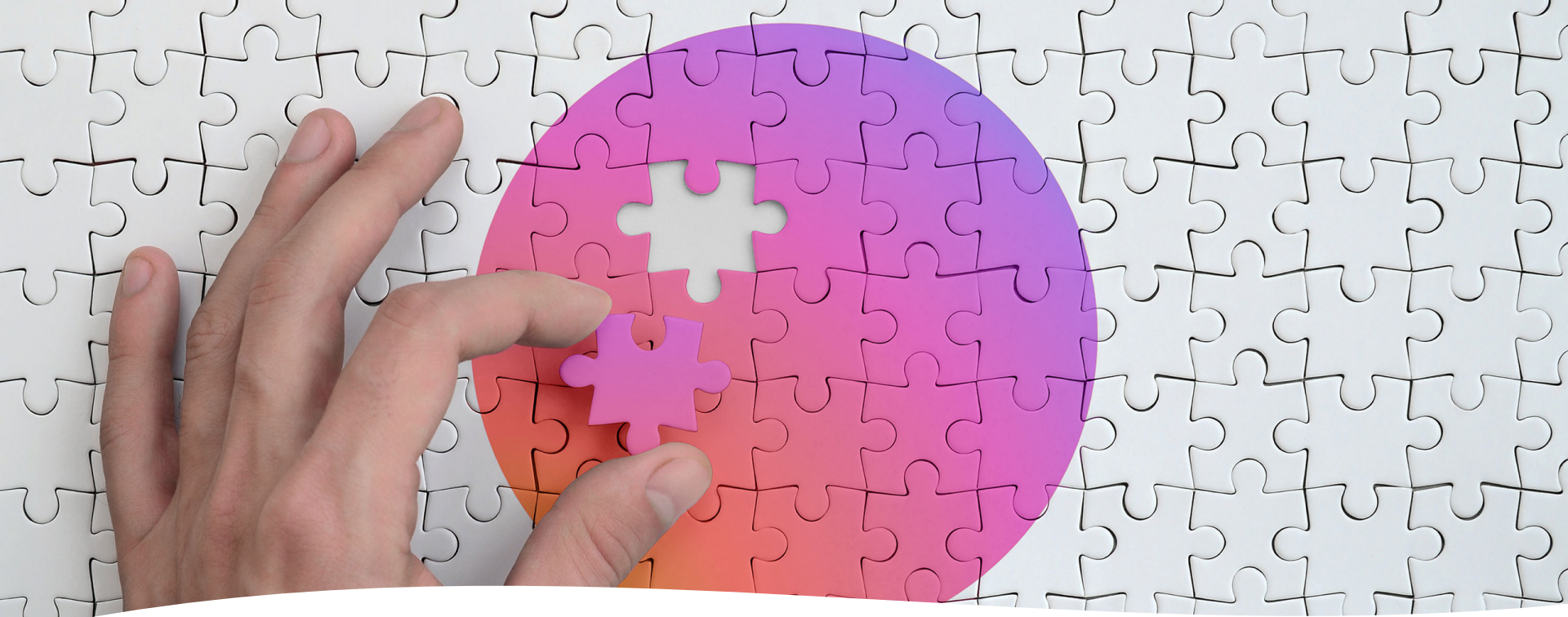
Fig. 28.2 Assessment of, for and as learning to assure constructive alignment (Clark 2010; Adapted by the authors)



Programmatic Assessment, or, “Assessment AS Learning”

“...when practicing summative assessment, we are acting far more as regulators than educators. The educator’s role, via the implementation of formative assessment, is to impart information, instill values and inspire excellence and ongoing learning”

Konopasek L, Norcini J, Krupat E. Focusing on the formative: Building an assessment system aimed at student growth and development. *Acad Med*. 2016;91(11):1492-1497.



Assessment AS Learning

“A programmatic approach where assessment of and for learning are merged. In a programme of assessment, methods of assessment are purposefully selected, mainly because of their intended positive effect on learning.”

van der Leuten CPM, Sluijsmans D, Joosten-ten Brink D. Competence assessment as learner support in education. In, *Competence-based vocational and professional education: Technical and vocational education and training-Issues, concerns and prospects*. 2017. Switzerland, Springer International Publishing.



Quick Strike Poll Qs# 6

Assessment AS Learning

state of the science

Assessment, feedback and the alchemy of learning

Christopher J Watling¹ & Shiphra Ginsburg²

CONTEXT Models of sound assessment practices increasingly emphasise assessment's formative role. As a result, assessment must not only support sound judgements about learner competence, but also generate meaningful feedback to guide learning. Reconciling the tension between assessment's focus on judgement and decision making and feedback's focus on growth and development represents a critical challenge for researchers and educators.

METHODS We synthesise the literature related to this tension, framed around four trends in education research: (i) shifting perspectives on assessment; (ii) shifting perspectives on feedback; (iii) increasing attention on learners' perceptions of assessment and feedback, and (iv) increasing attention on the influence of culture on assessment and feedback. We describe factors that produce and sustain this tension.

RESULTS The lines between assessment and feedback frequently blur in medical

education. Models of programmatic assessment deliberately use the same data for both purposes: lowstakes individual data points are used formatively, but then are added together to support summative judgements. However, the translation of theory to practice is not straightforward. Efforts to embed meaningful feedback in programmes of learning face a multitude of threats. Learners may perceive assessment with formative intent as summative, restricting their engagement with it as feedback, and thus diminishing its learning value. A learning culture focused on assessment may limit learners' sense of safety to explore, to experiment, and sometimes to fail.

CONCLUSIONS Successfully blending assessment and feedback demands clarity of purpose, support for learners, and a system and organisational commitment to a culture of improvement rather than a culture of performance.

Medical Education 2018
doi: 10.1111/medu.13645

¹Department of Clinical Neurological Sciences, Schulich School of Medicine and Dentistry, Western University, London, Ontario, Canada

²Department of Medicine, University of Toronto, Toronto, Ontario, Canada

Correspondence: Christopher J Watling, Office of Postgraduate Medical Education, Medical Sciences Building Room M103, Schulich School of Medicine and Dentistry, Western University, London, Ontario N6A 5C1, Canada. Tel: 00 1 519 661 2019; Email: Chris.watling@schulich.uwo.ca

assessment for learning

Taking the sting out of assessment: is there a role for progress testing?

Debra Pugh¹ & Glenn Regehr²

CONTEXT It has long been understood that assessment is an important driver for learning. However, recently, there has been growing recognition that this powerful driving force of assessment has the potential to undermine curricular efforts. When the focus of assessment is to categorise learners into competent or not (i.e. assessment of learning), rather than being a tool to promote continuous learning (i.e. assessment for learning), there may be unintended consequences that ultimately hinder learning. In response, there has been a movement toward constructing assessment not only as a measurement problem, but also as an instructional design problem, and exploring more programmatic models of assessment across the curriculum. Progress testing is one form of assessment that has been introduced, in part, to attempt to address these concerns. However, in order for any assessment tool to be successful in promoting learning, careful consideration must be given to its implementation.

OBJECTIVE The purpose of this paper is to consider the implications of implementing progress testing within practice, and how this might promote or impede learning in the three phases of assessment (pre-test, pure-test and post-test).

METHODS We will examine the literature on how assessment drives learning and how this might apply to progress testing. We will also explore the distinction between assessment of learning and assessment for learning, including ways in which they overlap and differ. We end by discussing how the properties of an assessment tool can be harnessed to optimise learning.

CONCLUSIONS Progress tests are one potential solution to the problem of removing (or at least lessening) the sting associated with assessment. If implemented with careful thought and consideration, progress tests can be used to support the type of deep, meaningful and continuous learning that we are trying to instill in our learners.

Medical Education 2016; 50: 721–729
doi: 10.1111/medu.12988

Discuss ideas arising from the article at
www.mededuc.com/discuss



¹Department of Medicine, University of Ottawa, Ottawa, Ontario, Canada

²Faculty of Medicine, Centre for Health Education Scholarship, University of British Columbia, Vancouver, British Columbia, Canada

Correspondence: Debra Pugh, University of Ottawa, 501 Smyth Road, Box 209, Ottawa, ON, K1H 8L6, Canada. Tel: 613-737-8899. Email: dpugh@uottawa.ca

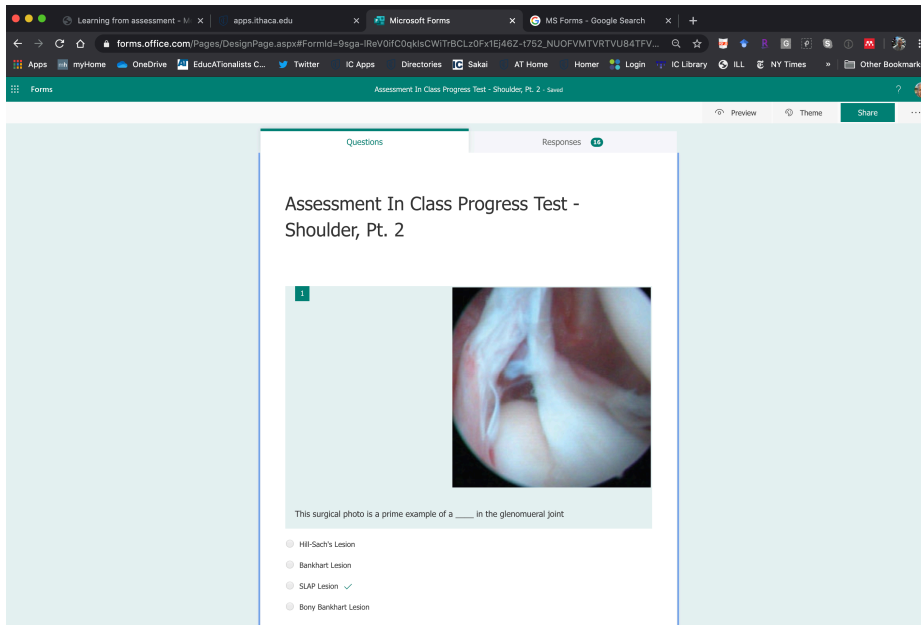
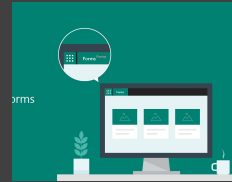
© 2016 John Wiley & Sons Ltd. MEDICAL EDUCATION 2016; 50: 721–729



Programmatic Assessment in AT Webinar, PR Geisler, May 26, 2020



Progress Testing w/in Class(es) Micro Progress



Learning from assessment - Microsoft Forms - Google Search

forms.office.com/Pages/DesignPage.aspx?FormId=8aga-IReV0HCQgkicWITBCLz0Fk1E46Z-4752-NUOFVMTVRTVU84TFV...

Assessment In Class Progress Test - Shoulder, Pt. 2 - saved

Questions Responses

Assessment In Class Progress Test - Shoulder, Pt. 2

This surgical photo is a prime example of a ____ in the glenohumeral joint

☐ Hill-Sachs's Lesion

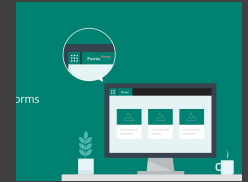
☐ Bankhart Lesion

☒ SLAP Lesion

☐ Bony Bankhart Lesion

- No stakes assessments
- Feedback driven
- Gauges ATS progress towards class SLOs (micro)
- Directs student learning and remediation
- Informs teaching and class' summative assessment

Programmatic Progress Testing *Macro Progress*



This "no stakes", formative assessment is designed to see "where you are" in Clinical Capability #6 - Therapeutic Interventions and Reasoning (TR). The purpose is to see how well you have learned and retained what has been covered in the curriculum at some point in the past—in the classroom and the clinic. Do your best, there is no time limit, and there are no stakes or pressures. You will get feedback and a final "score" at the end; use that feedback to identify your weaknesses and use it to make your weaknesses into strengths within this Clinical Capability. It is all part of self-directed and lifelong learning, and the path towards expertise. Keep in mind that this is a small sample size of your progress and capability in this domain; you are still the best person who knows what you know and remember at this point.

This "no stakes", formative assessment is designed to see "where you are" in Clinical Capabilities #8 & 9 - HAO and PDR. The purpose is to see how well you have learned and retained what has been covered in the curriculum at some point in the past—in the classroom and the clinic. Do your best, there is no time limit, and there are no stakes or pressures. You will get feedback and a final "score" at the end; use that feedback to identify your weaknesses and use it to make your weaknesses into strengths within this Clinical Capability. It is all part of self-directed and lifelong learning, and the path towards expertise. Keep in mind that this is a small sample size of your progress and capability in this domain; you are still the best person who knows what you know and remember at this point.

- No stakes assessments; Feedback driven
- Gauges ATS progress towards clinical capabilities (Macro Goals)
- Matched w/curricular space/place
- Informs teaching and curriculum
- Directs student learning and remediation towards capabilities
- No studying or preparation
- Preceptor and Student Subjective Ratings of CC Progress
- Can *dually* serves as programmatic (exit) assessment measures, stakes or no stakes





**KEEP
CALM
AND
TAKE A
META-MOMENT**

KeepCalmAndPosters.com



Programmatic Assessment in AT Webinar, PR Geisler, May 26, 2020



Scenario #2

#2: You are a volunteer AT for a National Figure Skating Championships event. During warmups, as you are chatting with other volunteers and finishing setting up your work station, this happens (watch entire video). As you arrive on the scene, you note the athlete is in considerable PI and discomfort, very still, unwilling to move.

As you arrive, you try to calm him in order to perform a primary Hx and formulate a DDx; he is having difficulty speaking and doesn't really want your help. Given what you saw, he seems pretty good once he gets up and skates off, under his own power. But as he gets off the ice, he suddenly appears to struggle and needs help to exit the area, towards the AT clinic.


Once in the clinic, you find he has sharp, intense, 10/10 PI on his posterior-right side, "thinks he felt or heard a crack when the collision happened", and is now c/o diffuse chest PI on the posterior, Rt. side of his body. As a few minutes pass, you note PTP over the Rt. 7-8th ribs. Though difficult to be sure due to increasing anxiety on his part, he appears to be displaying dyspnea; he is currently tachycardic, and having difficulty communicating.

8

What is your #1, PRIMARY Dx at this point? *

(4 Points)

<https://www.youtube.com/embed/J84Vzizi.h?feature=oembed&modestbranding=1&rel=0>

Click the link to launch directly in YouTube. 

- ☐ Kidney Contusion
- ☐ Solar Plexus Contusion
- ☒ Rib Fracture
- ☐ Rib Contusion

Questions

Responses 11

Section 1 - Extended Match Questions

1

Extended Match Questions: Each may be used once, more than once or not at all for the cues that follow. Each cue/question only has one correct answer. For your answers, provide only the correct LETTER in the space below and make sure it is CAPITALIZED. (e.g., "A").

- A. Blackburn Exercises
- B. Double Limb Squats
- C. Anterior to Posterior Ankle Joint Mobilization
- D. Intrinsic Foot Muscle Strengthening
- E. Hip Abductor Strengthening
- F. PNF Inhibitory Technique
- G. D1 Upper Extremity PNF Pattern
- H. High Velocity Eccentric Training
- I. Agility Training
- J. Single Limb Balance Training

A swimmer reports having difficulty with overhead activities and symptoms of subacromial impingement. Upon evaluation, you determine that he has poor control of his rotator cuff muscles with overhead motion. Which of the above intervention strategies would assist in resolving the problem of poor rotator cuff muscle control? *

(1 Point)



Questions

Responses 10

2

What is the specific evidence-based clinical prediction rule that helps you Dx and thus, manage this type of on-field, acute presentation? *

(2 Points)

Enter your answer

Correct answers: Ottawa Ankle Rules

3

If the athlete WERE able to walk off the field under his own power, and to tolerate palpation (better) of the involved structures, what would be your top, #1 Dx? *

(4 Points)

- ☒ Medial Ankle Sprain
- ☒ High Ankle Sprain
- ☐ LL/Ankle Fx

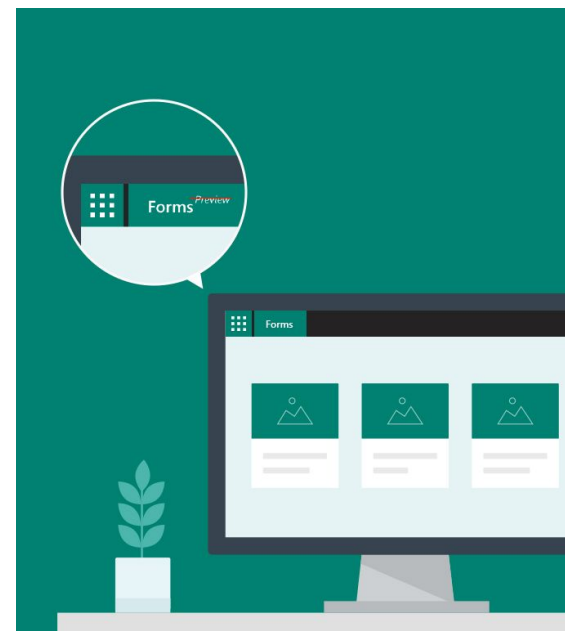
4

What is the best special test to help confirm a High Ankle Sprain Dx? *

(2 Points)

Enter your answer

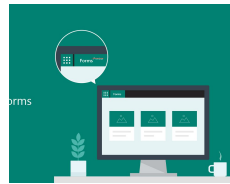
Correct answers: Kleigars



Multiple Approaches to Assessment EMQs, EBP MCQs, DxReasoning (DxR), TxReasoning (TxR), KSA

Programmatic Assessment

Assessing Clinical Capabilities, Virtually (Macro)



Integrated Clinical Capability - Assessment & DxReasoning SPRING 2020 - Saved

Questions Responses 10

Integrated Clinical Capability - Assessment & DxReasoning SPRING 2020 (85 Points)

Following are various patient presentations, each with relevant and irrelevant features for classic case pattern presentations. In order to assess your Dx Reasoning skills with typical patient presentations in athletic training settings, you need to provide the best answers for each follow-up question. Some modules are designed to be "easy", some are "moderate", and some are "difficult"—together, they cover acute/emergent, general medical and orthopedic scenarios.

Section 1

Scenario #1

Scenario #1: You are the AT covering this NFL game, and you get a very clear look of this MOI to the player's left, ankle/lower leg (watch entire video, it will take you to an external window). Forget what you "may" know about this injury (in real life, what it actually was, etc.), but based on the MOI and the initial management portrayed in the video, of the possibilities provided and in the context of it being "YOU" who has to evaluate and decide.

1

What is your TOP, #1 Dx for this athlete? * (4 Points)

https://www.youtube.com/embed/_8Uwypua8q2s?feature=oembed&modestbranding=1&rel=0


Click the link to launch directly in YouTube. ⓘ

Select your answer

Questions Responses 10

Section 4

Scenario #4



Scenario #4: It is late February in upstate NY. A regionally ranked distance runner presents in the AT clinic, c/o "feeling run down", and noticing as of late, general myalgia. She reports having ramped up her mileage by 30% in last 4-5 weeks in order to train for the Boston Marathon in April. Medical Hx reveals recent bout of influenza in late January, during which she took 3-4 days off from running, but then continued with her training program pretty aggressively about 5 days after "recovering" from the flu. Yesterday, she struggled to warm up well, and could "not get going", ending her run at only the 2nd mile mark because of "intense fatigue", retiring for a warm shower and bed. Her current core temperature is 101 F, and her affect is flat. She reported an odd sensation of "shortness of breath" climbing a few flights of stairs to get into your clinic just recently, and upon auscultation you note an apparent arrhythmia.

15

Based on the case presentation here, what is your top, #1 diagnostic concern here? (2 Points)

- ☐ HCM
- ☐ ARVD
- ☐ Marfan's Syndrome
- ☒ Myocarditis

Programmatic Assessment Assessing Clinical Capabilities, Virtually

MEDICAL TEACHER
https://doi.org/10.1080/0142159X.2018.1481281



TWELVE TIPS

Twelve tips for developing key-feature questions (KFQ) for effective assessment of clinical reasoning

Marla Nayer^a, Susan Glover Takahashi^b and Patricia Hrynchak^b

^aUniversity of Toronto, Toronto, ON, Canada; ^bUniversity of Waterloo, Waterloo, ON, Canada

ABSTRACT

Clinical reasoning is the cognitive process that makes it possible for us to reach conclusions from clinical data. "A key feature (KF) is defined as a significant step in the resolution of a clinical problem. Examinations using key-feature questions (KFQs) focus on a challenging aspect in the diagnosis and management of a clinical problem where the candidates are most likely to make errors." KFQs have been used at different levels of medical education and practice, from undergraduate to certification examinations. KFQs illuminate the strengths and limits of an individual's clinical problem-solving ability. These types of items are more likely than other forms of assessment to discriminate among stronger or weaker candidates in the area of clinical reasoning. The 12 tips in this article will provide guidance to faculty who wish to develop KFQs for their tests.

Introduction

Clinical reasoning is the cognitive process that makes it possible for us to reach conclusions from clinical data, and come to a clinical decision. "A key feature (KF) is defined as a significant step in the resolution of a clinical problem. Examinations using key-feature questions (KFQs) focus on a challenging aspect in the diagnosis and management of a clinical problem where the candidates are most likely to make errors" (Hrynchak et al. 2014). KFQs have been used for undergraduate medical education, graduate medical education, and licensure examinations (Farmer and Hinchy 2005; Fischer et al. 2005; Leung et al. 2016). KFQs, by their nature, are focused on clinical reasoning and move away from the assessment of rote knowledge or comprehension towards synthesis and evaluation of information in Bloom's cognitive taxonomy (Armstrong 1956; Anderson and Krathwohl 2001; Krathwohl 2002).

Some authors use the terms clinical reasoning and clinical decision making and problem solving interchangeably (Van der Vleuten and Newble 1995; Page 1999 Introduction), or have different definitions of these terms (van Bruggen, Manrique-van Woudenberg et al. 2012; Duming et al. 2013). For our purposes, clinical reasoning is a concept that reflects the cognitive process. It can include the assessment, diagnosis, and management of a patient. This includes, but is not limited to, clinical decision making (Hrynchak et al. 2014; Escudier et al. 2018). KFQs measure clinical reasoning (Eva 2005; Igen et al. 2012).

Research suggests that clinical reasoning skills are specific to the case or problem encountered (case specificity, also referred to as context or content specificity) (Norman et al. 2006). Successful clinical reasoning is contingent on understanding and using the few elements of the problem that are crucial to its successful resolution. KFQs represent

the critical information needed in the identification or management of a clinical problem. KFQs are focused on case scenarios, often with two to five items for each scenario, and illuminate the strengths and limits of an individual's clinical reasoning. This enables the instructor to have accurate information about the learner's clinical decision making ability. For example, a KFQ will focus on those key elements in a case history that are most likely to lead to a correct diagnosis, either by ruling in or ruling out specific differential diagnoses. These types of items are more likely than other forms of assessment to discriminate among stronger or weaker candidates in the area of clinical reasoning (Schuwirth et al. 2001; Leung et al. 2016).

KFQs have been validated by being administered to practicing clinicians, with positive results. These include physicians (Bordage et al. 1997), and physical therapists and occupational therapists (Glover Takahashi et al. 2012). These types of items appear to have predictive ability for future regulatory complaints (Tamblin et al. 2007) as well as for quality of care (Wenghofer et al. 2009; Tamblin et al. 2010). They have been used successfully with clinical clerks (Hatala and Norman 2002; Fischer et al. 2005; Lang et al. 2014), and junior doctors (Leung et al. 2016), as well as in licensure or certification examinations and maintenance of competence programs (Bordage, Bralovsky, et al. 1995; Page and Bordage 1995; Page et al. 1995; Farmer and Hinchy 2005; Lawrence et al. 2011; Glover Takahashi et al. 2012; Bralovsky et al. 2014). They have also been used for jurisprudence content, as well as various intrinsic CanMEDS roles (Royal College of Physicians and Surgeons of Canada 2005); e.g. Communicator, Collaborator, Health Advocate, Scholar, and Professional (Glover Takahashi et al. 2012). Incorporating KFQs into assessment programs will enhance the assessment programs and provide additional information to faculty on learner abilities (Hrynchak et al. 2014).

CONTACT Marla Nayer Marla.nayer@utoronto.ca 500 University Avenue 6th Floor, Toronto, ON M5G 1V7, Canada

^aSupplemental data for this article can be accessed here.

© 2018 Informa UK Limited, trading as Taylor & Francis Group

MEDICAL TEACHER, 2016
http://dx.doi.org/10.3109/0142159X.2016.1170776



Script-theory virtual case: A novel tool for education and research

Jake Hayward^a, Amandy Cheung^b, Alkarim Velji^c, Jenny Altarejos^d, Peter Gill^e, Andrew Scarfe^f and Melanie Lewis^g

^aDepartment of Emergency Medicine, University of Alberta, Edmonton, Alberta, Canada; ^bDepartment of Family Medicine, University of Alberta, Edmonton, Alberta, Canada; ^cDepartment of Emergency Medicine, University of Manitoba, Winnipeg, Manitoba, Canada; ^dFaculty of Medicine and Dentistry, University of Alberta, Edmonton, Alberta, Canada; ^eDepartment of Pediatrics, The Hospital for Sick Children, University of Toronto, Toronto, Ontario, Canada; ^fDepartment of Oncology, University of Alberta, Edmonton, Alberta, Canada; ^gDepartment of Pediatrics, Stollery Children's Hospital, University of Alberta, Edmonton, Alberta, Canada

ABSTRACT

Context/Setting: The script theory of diagnostic reasoning proposes that clinicians evaluate cases in the context of an "illness script," iteratively testing internal hypotheses against new information eventually reaching a diagnosis. We present a novel tool for teaching diagnostic reasoning to undergraduate medical students based on an adaptation of script theory. **Intervention:** We developed a virtual patient case that used clinically authentic audio and video, interactive three-dimensional (3D) body images, and a simulated electronic medical record. Next, we used interactive slide bars to record respondents' likelihood estimates of diagnostic possibilities at various stages of the case. Responses were dynamically compared to data from expert clinicians and peers. Comparative frequency distributions were presented to the learner and final diagnostic likelihood estimates were analyzed. Detailed student feedback was collected.

Observations: Over two academic years, 322 students participated. Student diagnostic likelihood estimates were similar year to year, but were consistently different from expert clinician estimates. Student feedback was overwhelmingly positive; students found the case was novel, innovative, clinically authentic, and a valuable learning experience.

Discussion: We demonstrate the successful implementation of a novel approach to teaching diagnostic reasoning. Future study may delineate reasoning processes associated with differences between novice and expert responses.

Introduction

Diagnostic error

Effective and safe health care hinges upon accurate clinical diagnosis. Landmark studies suggest diagnostic error accounts for approximately 5–17% of preventable errors in hospitalized patients (Leape et al. 1991). A systematic review of four decades of autopsy studies found that approximately 9% of patients experienced a major pre-mortem diagnostic error that went undetected (Shojania et al. 2003). Common diagnoses are more frequently missed than esoteric ones (Graber et al. 2005; Singh et al. 2007; Schiff et al. 2009; Zwaan et al. 2010) and cognitive failure rather than knowledge deficit is the predominant cause of error (Campbell et al. 2007). The apparent link between diagnostic error and patient safety highlights a need to better understand diagnostic reasoning, its cognitive correlates and how best to teach diagnostic reasoning to students and trainees (Newman-Toker and Pronovost 2009).

Diagnostic reasoning, and avoidance of diagnostic error, is learned and refined as novice clinicians' progress to expert clinicians. Traditional undergraduate medical education emphasizes large group didactic teaching for knowledge transfer and small group problem-based learning for exposing knowledge processes (Nandi et al. 2000). Little time is devoted to explicit teaching of clinical reasoning, especially during the preclinical years, typically leaving this for implicit exposure during the clinical years. Sound clinical judgment relies on sound clinical reasoning, a cognitive skill

Practice Points

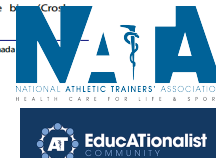
- Clinical expertise and diagnostic reasoning is acquired through complex learning processes that are poorly understood.
- The best approach to teaching diagnostic reasoning remains unclear and current methods are underdeveloped.
- We present evidence that an online, group-based, reflective approach to teaching diagnostic reasoning is both feasible and valuable as an adjunct to standard undergraduate curricula.
- Our technology is grounded in the script theory of diagnostic reasoning and represents a case-based adaptation of script concordance testing methods.
- The results suggest a possible role for our technology in future research on the development of clinical expertise.

In its own right that is not imparted through acquisition of factual knowledge (Elstein et al. 1989). Croskerry advocates explicit teaching of explicit strategies for reducing cognitive error (Croskerry 2002) and has demonstrated how this can be implemented in an undergraduate medical curriculum in a course teaching principles of cognitive bias (Croskerry et al. 2013).

CONTACT Jake Hayward jhayward@ualberta.ca University of Alberta, Department of Emergency Medicine, Edmonton, Alberta, Canada

^aSupplemental data for this article can be accessed here.

© 2016 Informa UK Limited, trading as Taylor & Francis Group



Programmatic Assessment Assessing Clinical Capabilities, Virtually

MEDICAL TEACHER, 2017
VOL. 39, NO. 5, 476-483
<http://dx.doi.org/10.1080/0141599.2017.1297525>



Electronic assessment of clinical reasoning in clerkships: A mixed-methods comparison of long-menu key-feature problems with context-rich single best answer questions

Sören Huwendiek^a, Friedrich Reicher^b, Cecilia Duncker^a, Bas A. de Leng^d, Cees P. M. van der Vleuten^a, Arno M. M. Mulijns^a, Hans-Martin Bosse^c, Martin Haag^d, Georg F. Hoffmann^b, Burkhard Tönshoff^c and Diana Dolmans^a

^aDepartment of Assessment and Evaluation, Institute of Medical Education, University of Bern, Bern, Switzerland; ^bDepartment of Pediatric Cardiology and Intensive Care Medicine, Klinikum Stuttgart, Stuttgart, Germany; ^cClinic for Child and Adolescent Psychiatry, University Hospital Kiel, Germany; ^dInstitute of Medical Education (IMS), Faculty of Medicine, University of Münster, Münster, Germany; ^eDepartment of Educational Development and Research, Maastricht University, Maastricht, the Netherlands; ^fClinic for General Paediatrics, Neonatology and Paediatric Cardiology, University Children's Hospital Düsseldorf, Düsseldorf, Germany; ^gGECKO Institute of Medicine, Informatics & Economics, Heilbronn University, Heilbronn, Germany; ^hClinic I, University Children's Hospital Heidelberg, Heidelberg, Germany

ABSTRACT

Background: It remains unclear which item format would best suit the assessment of clinical reasoning: context-rich single best answer questions (crSBAs) or key-feature problems (KFPs). This study compared KFPs and crSBAs with respect to students' acceptance, their educational impact, and psychometric characteristics when used in a summative end-of-clinical-clerkship pediatric exam.

Methods: Fifty-year medical students ($n = 377$) took a computer-based exam that included 6–9 KFPs and 9–20 crSBAs which assessed their clinical reasoning skills, in addition to an objective structured clinical exam (OSCE) that assessed their clinical skills. Each KFP consisted of a case vignette and three key features using a "long-menu" question format. We explored students' perceptions of the KFPs and crSBAs in eight focus groups and analyzed statistical data of 11 exams.

Results: Compared to crSBAs, KFPs were perceived as more realistic and difficult, providing a greater stimulus for the intense study of clinical reasoning, and were generally well accepted. The statistical analysis revealed no difference in difficulty, but KFPs resulted more reliable and efficient than crSBAs. The correlation between the two formats was high, while KFPs correlated more closely with the OSCE score.

Conclusions: KFPs with long-menu exams seem to bring about a positive educational effect without psychometric drawbacks.

Introduction

Various question formats have been described for the assessment of clinical reasoning (Higgs et al. 2008). The impact of each of these formats on student learning is still not well understood. Better understanding of this "pre-assessment effect" (Cilliers et al. 2012) would pave the way for clinical clerkship directors to better steer student learning through the concluding assessment. We therefore conducted a study comparing two different item formats in terms of their impact on student learning and their relevant psychometric characteristics.

When comparing item formats several aspects are important. A test item essentially consists of two parts, that is, the stimulus and the response part (Schuwirth & van der Vleuten 2004). Whereas the former refers to the task imposed by the stem of an item, e.g. a case vignette, the latter denotes the method that examinees use to indicate their responses (Schuwirth & van der Vleuten 2004). The stimulus format can be either context-free or context-rich and shape the focus of the question (Schuwirth & van der Vleuten 2004). While context-free stimuli usually measure factual knowledge, context-rich stimuli, by contrast, serve to assess applied knowledge by presenting a specific

Practice points

- The analysis of focus group discussions revealed that students perceived KFPs with long-menu questions as providing a greater stimulus for the intense study of clinical reasoning than did crSBAs.
- Statistically, KFPs revealed a higher efficiency than crSBAs.
- This study supports the idea that, from an educational perspective, both the stimulus and response format of questions are important.
- Including KFPs with long menu in clerkship examinations seems to offer valuable opportunities to steer learning in clinical clerkships without psychometric drawbacks.

scenario and asking for decisions, focusing on key features to solve a clinical problem, for example (as when a case vignette is used). The comparison we make in the present study is between two question formats with a context-rich stem designed to assess clinical reasoning.

Sam et al. BMC Medical Education (2016) 16:266
DOI 10.1186/s12909-016-0793-z

BMC Medical Education

RESEARCH ARTICLE

Open Access



Validity of very short answer versus single best answer questions for undergraduate assessment

Amir H. Sam^{1,2}, Saira Hameed¹, Joanne Harris² and Karim Meeran^{1,2*}

Abstract

Background: Single Best Answer (SBA) questions are widely used in undergraduate and postgraduate medical examinations. Selection of the correct answer in SBA questions may be subject to cueing and therefore might not test the student's knowledge. In contrast to this artificial construct, doctors are ultimately required to perform in a real-life setting that does not offer a list of choices. This professional competence can be tested using Short Answer Questions (SAQs), where the student writes the correct answer without prompting from the question. However, SAQs cannot easily be machine marked and are therefore not feasible as an instrument for testing a representative sample of the curriculum for a large number of candidates. We hypothesised that a novel assessment instrument consisting of very short answer (VSA) questions is a superior test of knowledge than assessment by SBA.

Methods: We conducted a prospective pilot study on one cohort of 266 medical students sitting a formative examination. All students were assessed by both a novel assessment instrument consisting of VSAs and by SBA questions. Both instruments tested the same knowledge base. Using the filter function of Microsoft Excel, the range of answers provided for each VSA question was reviewed and correct answers accepted in less than two minutes. Examination results were compared between the two methods of assessment.

Results: Students scored more highly in all fifteen SBA questions than in the VSA question format, despite both examinations requiring the same knowledge base.

Conclusions: Valid assessment of undergraduate and postgraduate knowledge can be improved by the use of VSA questions. Such an approach will test nascent physician ability rather than ability to pass exams.

Keywords: Very short answer, Single best answer, Assessment, Testing, Validity, Reliability

Background

Single Best Answer (SBA) questions are widely used in both undergraduate and postgraduate medical examinations. The typical format is a question stem describing a clinical vignette, followed by a lead in question about the described scenario such as the likely diagnosis or the next step in the management plan. The candidate is presented with a list of possible responses and asked to choose the single best answer.

SBA questions have become increasingly popular because they can test a wide range of topics with high

reliability and are the ideal format for machine marking. They also have a definitive correct answer which is therefore not subject to interpretation on the part of the examiner.

However, the extent to which SBAs measure what they are intended to measure, that is their 'validity' is subject to some debate. Identified shortcomings of SBAs include the notion that clinical medicine is often nuanced, making a single best answer inherently flawed. For example, we teach our students to form a differential diagnosis, but the ability to do this cannot, by the very nature of SBA questions, be assessed by this form of testing. Secondly, at the end of the history and physical examination, the doctor has to formulate a diagnosis and management plan based on information gathered

* Correspondence: kmeeran@imperial.ac.uk
¹Division of Diabetes, Endocrinology and Metabolism, Imperial College, London, UK
²Medical Education Research Unit, School of Medicine, Imperial College, London, UK

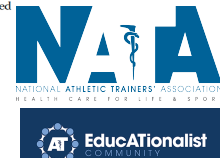


© 2016 The Author(s). **Open Access** This article is distributed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made. The Creative Commons Public Domain Dedication waiver (<http://creativecommons.org/publicdomain/zero/1.0/>) applies to the data made available in this article, unless otherwise stated.

CONTACT Sören Huwendiek soren.huwendiek@iml.unibe.ch ^aDepartment of Assessment and Evaluation, Institute of Medical Education, Faculty of Medicine, University of Bern, Konsumstrasse 13, CH-3010 Bern, Switzerland
© 2017 Informa UK Limited, trading as Taylor & Francis Group

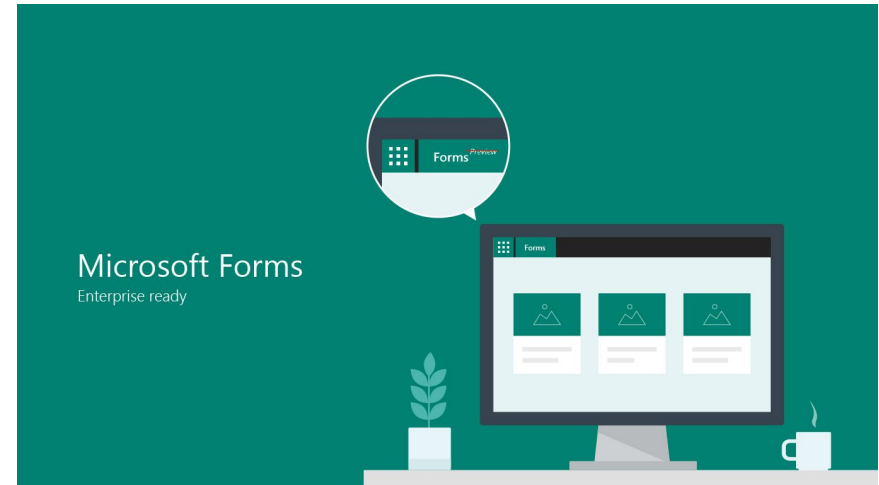


Programmatic Assessment in AT Webinar, PR Geisler, May 26, 2020

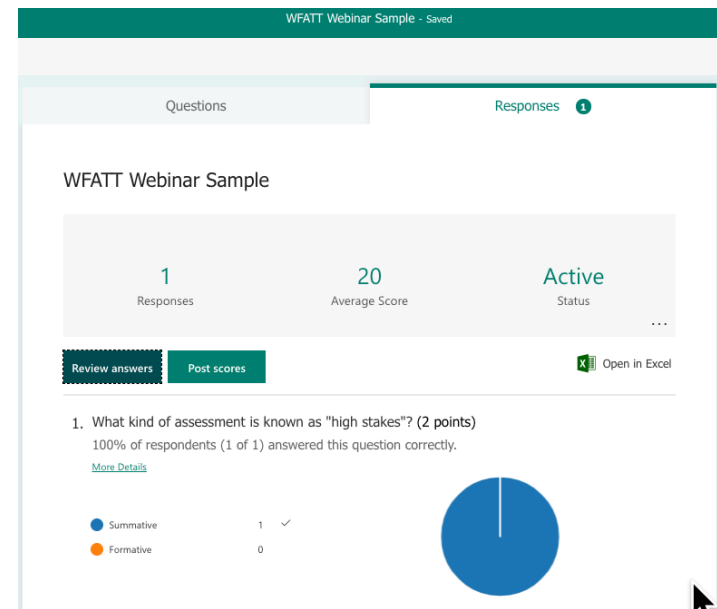
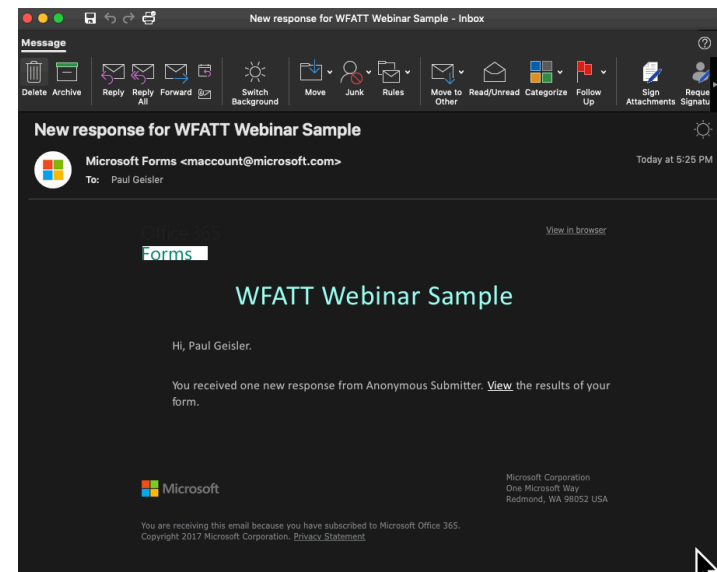


EducAionalist
COMMUNITY

Making Progress Tests using MS Forms

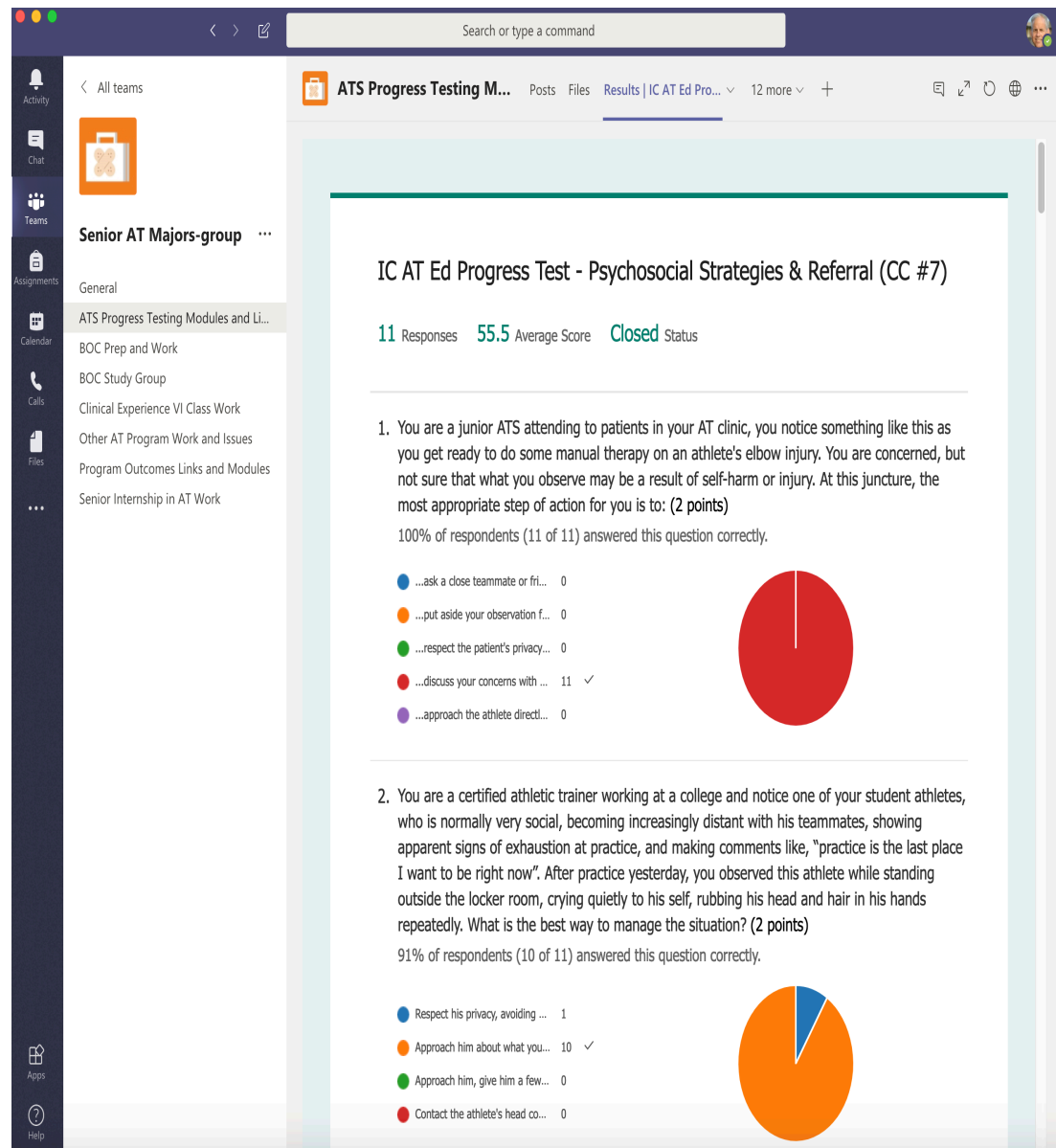


Progress Testing with MS Forms



Progress Testing

Providing Feedback to Students and Faculty



Progress Testing with *Qualtrics*TM

Preceptor Ratings of ATS
Capabilities

ATS Self Ratings



qualtrics.



Assessment AS Learning in *Qualtrics*™

Integrated Clinical
Capability Modules



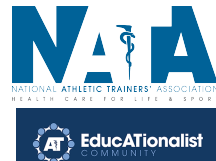
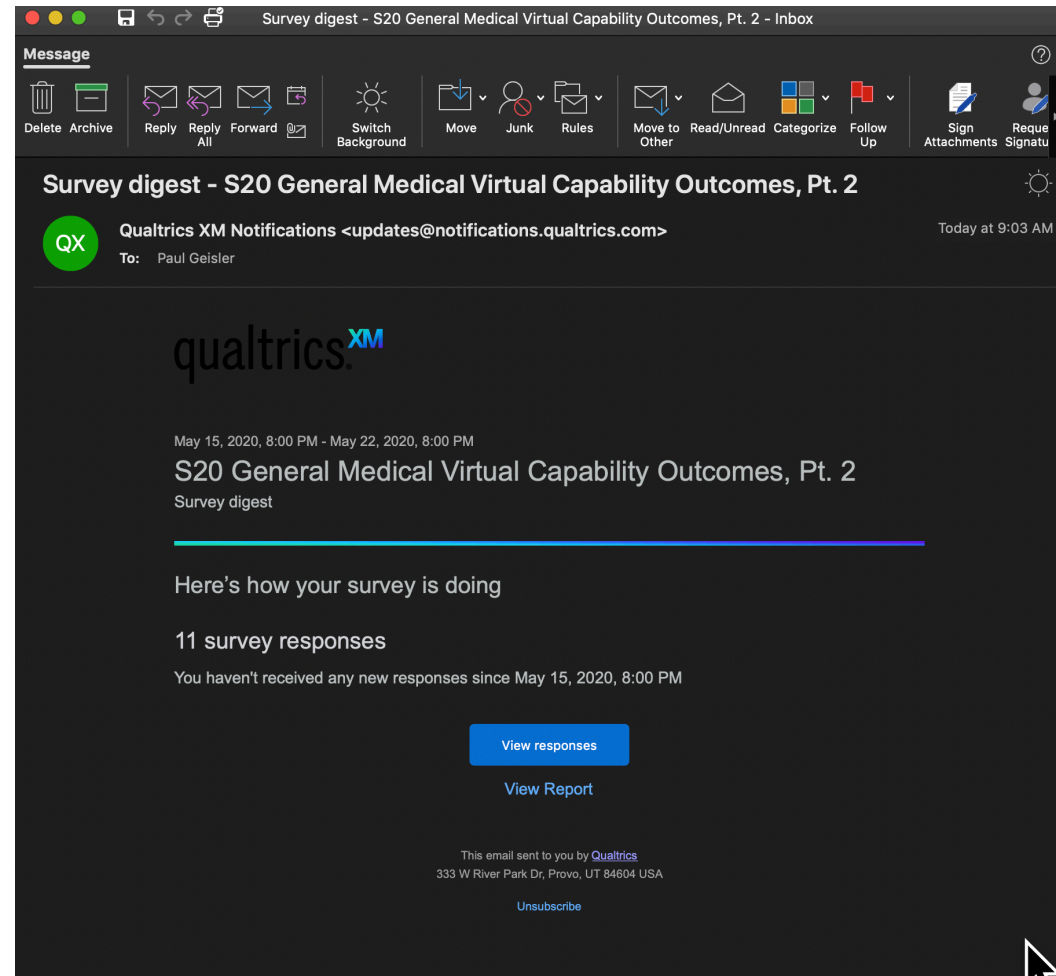
qualtrics.





Assessment AS Learning in *Qualtrics*TM

Integrated Clinical Capability Modules



Assessment Blueprint

Sophomore
Spring

- EBP
- PHP

Junior Fall

- DxRM-O
- ACI

Junior
Spring

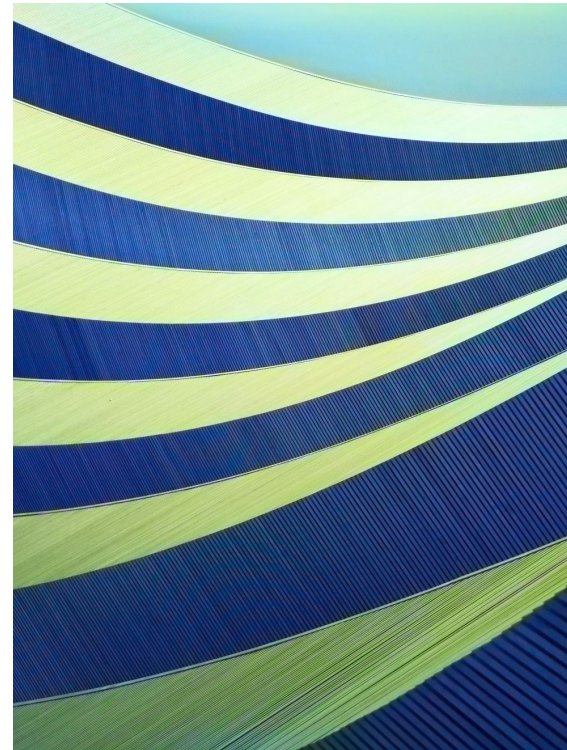
- TIR
- PSR
- PDR

Senior Fall

- ACI, DxRM-O, TIR, EBP, PDR, HAO,
DxRM-GM

Senior
Spring

- Integrated Capabilities



Tracking Student Progress & Program Effectiveness

AutoSave ON Class 2020 Outcomes Data A — Saved

Home Insert Draw Page Layout Formulas Data Review View Tell me

Paste Calibri (Body) 12 A A Wrap Text Merge & Center General Conditional Formatting Format as Table Cell Styles Insert Delete

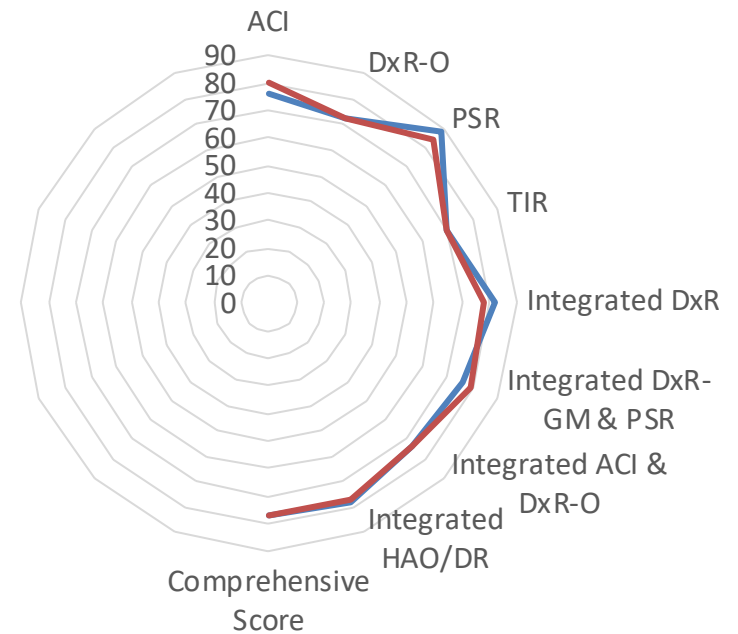
P16

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Student	Acute & Emergent Care	Ortho DxR Assessment	Psychosocial & LGBTQ Assessment	HC Org & Admin 1	HC Org & Admin 2	Therapeutic Reasoning 1	Therapeutic Reasoning 2	Integrated Dx Reasoning	Gen Med & Mental/Social Health Composite Score	Acute Care & Ortho/MSK Composite Score	HC Org & Admin Composite Score	Comprehensive Average Score
2	#	F19	F19	S20	S20	S20	S20	S20	S20	F19-S20	F19-S20	S20	F19-S20
3	Capabilities	#5 ACI	#3 CED-O	#7 PSR	#8 HAO	#8 HAO, #9 PDR	#6 TIR	#6 TIR	#3, #4, #5 CED-O, CED-GM, ACI	#1 EBP, #4 CED-GM, #7 PSR	#1 EBP, #3 CED-O, #5 ACI & #6 TIR	#8 HAO, #9 PDR	
4	Delivery	No Prep	No Prep	No Prep	No Prep	No Prep	No Prep	No Prep	No Prep	N/A	N/A	N/A	N/A
5	Purpose	Progress & Programmatic Assessment	Progress & Programmatic Assessment	Progress & Programmatic Assessment	Progress & Programmatic Assessment	Progress & Programmatic Assessment	Progress & Programmatic Assessment	Progress & Programmatic Assessment	Programmatic Assessment	Programmatic Assessment	Programmatic Assessment	Programmatic Assessment	Programmatic Assessment
6	1	76	72.5	88	66	90	51	89	82	76.000	74.1	78	77.525
7	2	90	82.5	73	71	88	63	83	84	79.143	80.5	79.5	80.786
8	3	90	90	97	86	95	73	92	90	80.143	87	90.5	86.911
9	4	84	80	97	69	93	63	97	92	81.286	83.2	81	84.372
10	5	84	82.5	88	91	95	61	89	74	88.571	78.1	93	83.418
11	6	82	60	88	51	80	41	75	70	75.429	65.6	65.5	69.132
12	7	61	52.5	88	31	88	44	75	60	72.143	58.5	59.5	62.536
13	8	84	77.5	76	71	92	47	83	84	76.429	75.1	81.5	79.257
14	9	70	67.5	73	46	87	53	81	78	77.000	69.9	66.5	72.850
15	10	78	67.5	73	60	88	47	81	65	75.000	67.7	74	70.425
16	11	78	70	85	63	88	61	92	75	83.000	75.2	75.5	77.175
17		79.727	72.955	84.182	64.091	89.455	54.909	85.182	77.636	78.558	74.082	76.773	76.762
18													

Student Performance by Capability

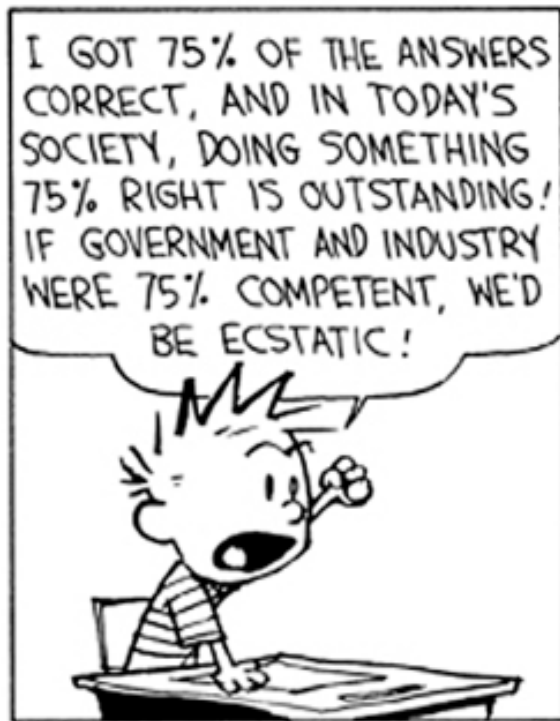
Progress Test Results

— Student — Cohort



Take Home Pearls

- Define (well) your goals and objectives (i.e., capabilities)
- Organize an assessment/capability team
- Work “backwards”, focusing on Assessment *FOR* Learning & AS Learning
- Conceptualize programmatic assessment as “guided journey”; not a “magical mystery tour”
- Aggregate data for greater *signal*, less noise
- Can validly assess CR & CDM w/digital platforms





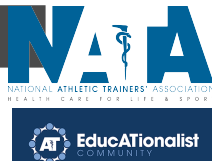
European Board of Medical Assessors



Resources



Programmatic Assessment in AT Webinar, PR Geisler, May 26, 2020





Hot off the press...



medical education

MEDICAL EDUCATION ADAPTATIONS

Rapid transition to online assessment: practical steps and unanticipated advantages

Christopher J. Mooney✉, Sarah E. Peyre, Nancy Shafer Clark, Anne C. Nofziger

First published:13 May 2020 | <https://doi.org/10.1111/medu.14225>

This article has been accepted for publication and undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the Version of Record. Please cite this article as doi:10.1111/medu.14225

PDF TOOLS SHARE

Abstract

The COVID-19 epidemic has required a paradigmatic shift in the delivery of medical education. By necessity, web-based learning has been widely adopted by medical educators to deliver content. Surrogate approaches to assessment have been less intuitive and must follow quickly. In a span of several weeks, we converted a multi-day, formative comprehensive assessment experience¹, which emphasizes the integration of medical knowledge, communication, information synthesis, and professionalism, into a fully digital platform to accommodate 105 second-year medical students.



Accepted Articles

Accepted, unedited articles published online and citable. The final edited and typeset version of record will appear in the future.

Advertisement

WILEY ONLINE LIBRARY FOR ADMINISTRATORS

Join us for our upcoming webinar
9 June, 9.30am EST

[REGISTER HERE](#)

WILEY

Related

Information

Metrics

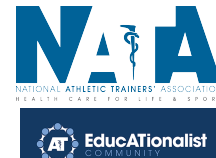
Am score 1

Details

This article is protected by copyright. All rights reserved.



Programmatic Assessment in AT Webinar, PR Geisler, May 26, 2020



Thank You, Host & Sponsor

Bryce Brennan &
Glen Bergeron &
University of
Winnipeg



Open Discussion

*Thoughts, questions,
input?*



“What if we don’t change at all ...
and something magical just happens?”



References

Huwendiek S, Reichert F, Duncker C, et al. Electronic assessment of clinical reasoning in clerkships: A mixed-methods comparison of long-menu key-feature problems with context-rich single best answer questions. *Med Teach*. 2017;39(5):476-485. DOI: [10.1080/0142159X.2017.1297525](https://doi.org/10.1080/0142159X.2017.1297525)

Bowe CM, Armstrong E. Assessment for systems learning: A holistic assessment framework to support decision making across the medical education continuum. *Acad Med*. 2017;92(5):585-592. DOI: [10.1097/ACM.0000000000001321](https://doi.org/10.1097/ACM.0000000000001321)

Schut S, Heeneman S, Bierer B, Driessen E, van Tartwijk J, van der Vleuten C. Between trust and control: Teachers' assessment conceptualisations within programmatic assessment. *Med Ed*. 2020;00:1-10. DOI: [10.1111/medu.14075](https://doi.org/10.1111/medu.14075)

Pack R, Lingard L, Watling C, Cristancho S. Beyond summative decision making: Illuminating the broader roles of competence committees. *Med Ed*. 2020;54:517-527. DOI: [10.1111/medu.14072](https://doi.org/10.1111/medu.14072)

Schuwirth LWT, van der Vleuten CPM. How 'testing' has become 'programmatic assessment for learning'. *Health Prof Ed*. 2019;5(3):177-184. DOI: [10.1016/j.hpe.2018.06.005](https://doi.org/10.1016/j.hpe.2018.06.005)

Govaerts MJB, van der Vleuten, CPM, Holmboe ES. Managing tensions in assessment: Moving beyond either-or thinking. *Med. Ed*. 2018;53(1):64-75. DOI: [10.1111/medu.13656](https://doi.org/10.1111/medu.13656)

van der Vleuten CPM. A programmatic approach to assessment. *Med Sci Educ*. 2016;26(S1):S9-S10. DOI: [10.1007/s40670-016-0343-7](https://doi.org/10.1007/s40670-016-0343-7)

Pugh D, Regehr G. Taking the sting out of assessment: Is there a role for progress testing? *Med Ed*. 2016;50:721-729. DOI: [10.1111/medu.12985](https://doi.org/10.1111/medu.12985)

Harrison CJ, Konings KD, Schuwirth LWT, Wass V, van der Leuten CPM. Changing the culture of assessment: The dominance of the summative assessment paradigm. *BMC Med Ed*. 2017;17(73):1-14. DOI: [10.1186/s12909-017-0912-5](https://doi.org/10.1186/s12909-017-0912-5)

van der Leuten CPM, Sluijsmans D, Joosten-ten Brink D. Competence assessment as learner support in education. In, *Competence-based vocational and professional education: Technical and vocational education and training-Issues, concerns and prospects*. 2017. Switzerland, Springer International Publishing.

Konopaske L, Norcini J, Krupat E. Focusing on the formative: Building an assessment system aimed at student growth and development. *Acad Med*. 2016;91(11):1492-1497. DOI: [10.1097/IACM.0000000000001171](https://doi.org/10.1097/IACM.0000000000001171)