

Activity 1: Literature Plan for Medical Simulation Fellowship_FY21 (July 2020-June 2021) – example of both self-training and team-based training, as these were the articles for journal club this past year

Month	Topic	Reading materials
1 July	Introduction to SBME	A critical review of SBME research 2003-2009_McGaghie_Med Educ 2010 Sim Training as Mechanism for Procedural and Resusc Educ for Peds Residents_Mills_Hosp Pediatr 2013 Technology-enhanced Simulation and Pediatric Education: A Meta-analysis_Cheng_Pediatrics 2014 SBME in pediatrics_Lopreiato_Acad Pediatr 2015
2 Aug	Simulation Fidelity	Beyond Fidelity_Schoenherr_SIH_2017 Does Appearance Matter - Moulage in Sim_Stokes-Parrish_SIH_2017 Educational Efficacy of high-fidelity sim in neonatal resuscitation training_Huang_BMC Medical Educ 2019 Participant Perspectives on Contributions of Physical, Psychologic and Sociological Fidelity_Naismith_SIH 2020
3 Sept	Scenario Design	The Template of Events for Applied and Critical Healthcare Simulation - A Tool for Systematic Simulation Scenario Design_Benishekl_SIH 2015 An Event-Based Approach to Design a Teamwork Training Scenario and Assessment Tool in Surgery_Nguyen_J Surg Educ 2016 Simulation Clinical Scenario Design Workshop_Robertson_MedEd Portal 2017 Realistic healthcare simulation scenario - what is relevant for design_Kaneko_Rev Esc Enferm USP 2019
4 Oct	Debriefing	A Theory and Method for Debriefing with Good Judgement_Rudolph_Sim Healthcare 2006 Promoting Excellence and Reflective Learning in Simulation_Eppich_Sim Healthcare 2015 Co-debriefing for simulation-based education_Cheng_Sim Healthcare 2015 Effects of post-scenario debriefing versus stop-and-go debriefing - a randomized controlled trial_Schober_BMC Med Educ 2019
5 Nov	Simulation-based Clinical Systems Testing	Prevent Safety Threats in New Construction through Integration of Simulation and FMEA_Colman_Pediatr Qual Saf 2019 Commissioning simulations to test new healthcare facilities: a proactive and innovative approach to healthcare system safety_Kaba_Adv Simul 2019 Simulation-based clinical systems testing for healthcare spaces: from intake through implementation_Colman_Adv Simul 2019 PEARLS for Systems Integration: A Modified PEARLS Framework for Debriefing Systems-Focused Simulations_Dube_Sim Healthcare 2019
6 Dec	Validity: evidence, argument and decision	A contemporary approach to validity arguments - practical guide to Kanes framwork_Cook_Med Educ 2015 Pediatric Airway Assessment Tool_Wing_MedEdPortal 2020 Validation of educational assessments - a primer for simulation_Cook_Advances Sim 2016 Validity - on the meaningful interpretation of assessment data_Downing_Med Educ_2003 When I say...validity_Cook_Med Educ 2014*
7	Systems-based facilitator training	In lieu of journal club, we ran a 3-hour sessions (including two simulations) where we trained the staff, including this year's fellow, on systems-based facilitations modeled on the PEARLS framework

8	Simulation to train team leaders	Effect of CRM team leader training_Casteleo_BMC Med Educ_2015 High performing trauma teams...shared mental model_Johnsen_Scand J Trauma Resusc Emerg Med_2017 Filling the gap - sim-based CRM training for EM residents_Parsons_West J Emerg Med_2018 Targeted Sim-based Leadership Training for Trauma Team Leaders_Rosenman_West J Emerg Med_2019
9	Not applicable	This month's journal club was original plan to discuss RCDP – due to completing interests surrounding the FY22 schedule release and the upcoming CCB work (scheduling, planning, etc.) we chose to use the hour originally planned for journal club to focus on those discussions. The RCDP journal club was rescheduled for May.
10	Digital Experience: VR, AR and other immersive training	VR simulation for peds airway intubation readiness education_Cureus_2020 Comparison of VR with traditional education - meta-analysis article_Ann Transl Med_2021 VR for Pediatric Sedation - a RCT using simulation_Cureus_2016 VR practice vs traditional equipment practice for ABCDE exam - a RCT_BMC Medical Educ_2020
11	Rapid cycle deliberate practice – more than just code team training	Rapid Cycle Deliberate Practice to Facilitate "Nano" In Situ Simulation: An Interprofessional Approach to Just-in-Time Training_Brown_Crit Care Nurse_2021 Rapid Cycle Deliberate Practice Simulation Curriculum Improves Pediatric Trauma Performance: A Prospective Cohort Study_Yan_Simul Healthc_2020 Rapid Cycle Deliberate Practice (RCDP) as a Method to Improve Airway Management Skills - A Randomized Controlled Simulation Study_Gross_Cureus_2019 Rapid Cycle Deliberate Practice in Medical Education - a Systematic Review_Taras_Cureus_2017 Rapid Cycle Deliberate Practice in Medical Simulation_Cheng_Stat Pearls_2020
12	Video-assisted debriefing	Effectiveness of Video Assisted Debriefing_Simul Healthc 2012 Eval of 2 strategies for debriefing sim for neonatal resuscitation - an RCT_BMC Res Notes 2018 Effectiveness of Video-Assisted Debriefing in Sim-based Health Professions Education_Nurse Educ 2019 Equivalence of Video Self-review Vs Debriefing After Sim-can Faculty Resources be Reallocated_AEM Educ 2020

Activity 2: Course development discussion given by Program Director to fellow – example of 1-on-1 training session

Slide 1

Medical Simulation:

Course Development

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Slide 2

Not just the scenarios

- When you embark on developing simulation-based courses, it is not only crafting high-level scenarios but includes the following:
 - Needs assessment
 - Identification of content expert(s)
 - Development of learning objectives
 - Scenario design and piloting
 - Recruitment and training of facilitators
 - Scheduling of courses
 - Measuring impact of course, i.e. seeking validity



Slide 3

Begin early...

- Requires careful planning and continual revision
 - 4 months for standard course
 - 6 months if research is included
- Consult with colleagues who have taught similar courses
 - Learn from their strategies
 - Ask about their general impressions of the learners
- If you are co-instructing, need to discuss:
 - Course goals
 - Teaching philosophies and methods
 - Course content and policies
 - Specific responsibilities for each instructor



Slide 4

Define course goals

- Perform a needs assessment of learners
 - A representative sample of learners can often be done by surveying 10-20% of learners
 - May need to include multiple professions
- Gather input from leadership, i.e. unit directors or educators
 - Often comes from the content experts and facilitators
- Consider both technical and non-technical needs
 - Are there patient or unit level needs you can identify?
- Focus on observable and measurable behaviors



Slide 5

Define course goals

- Bloom's Taxonomy of Educational Objectives:
 - Knowledge
 - Comprehension
 - Application
 - Analysis
 - Synthesis
 - Evaluation
- Link these processes to representative skills, as well as verbs you would use when writing learning objectives



The diagram shows a pyramid with six levels, each with associated verbs and skills. From top to bottom: 1. Evaluation (Verbs: Evaluate, Judge, Appraise, Critique, Defend, Select; Skills: Distinguishing, Conceiving, Judging, Verifying, Speculating, Judging). 2. Synthesis (Verbs: Create, Construct, Design, Develop, Formulate, Produce; Skills: Planning, Organizing, Integrating, Producing, Designing, Managing). 3. Analysis (Verbs: Analyze, Break down, Compare, Contrast, Differentiate, Distinguish, Examine, Investigate, Separate, Sort out; Skills: Analyzing, Comparing, Contrasting, Distinguishing, Examining, Investigating, Separating, Sorting out). 4. Application (Verbs: Apply, Implement, Use; Skills: Applying, Implementing, Using). 5. Comprehension (Verbs: Understand, Interpret, Explain, Summarize, Paraphrase, Restate, Translate, Convert, Change, Transform; Skills: Understanding, Interpreting, Explaining, Summarizing, Paraphrasing, Restating, Translating, Converting, Changing, Transforming). 6. Knowledge (Verbs: Know, Remember, Recall, Recognize, Identify, List, Label, Name, Match, Sort, Classify, Categorize, Define, Describe, Locate, Find, Retrieve, Select, Obtain, Collect, Gather, Assemble, Assemble, Assemble; Skills: Knowing, Remembering, Recalling, Recognizing, Identifying, Listing, Labeling, Naming, Matching, Sorting, Classifying, Categorizing, Defining, Describing, Locating, Finding, Retrieving, Selecting, Obtaining, Collecting, Gathering, Assembling, Assembling, Assembling).



Slide 6

Writing learning objectives

- **Specific**
 - define the activity, procedure, or assessment you want the learners to perform
- **Measurable**
 - With some kind of tool
- **Attainable**
 - for the learner within the time frame of the scenarios
- **Relevant**
 - And Results oriented
- **Targeted**
 - to the learners and their level of training, experience, scope of practice



Slide 7

Learning objectives

- Connect the course goals to measurement of the course's impact
- They are the foundation for evaluation of the:
 - Course
 - Instructor(s)
 - Scenarios
 - Learners
- They are introduced to the learner differently in simulation than in other types of courses
 - Often during debriefings instead of at beginning of session



Slide 8

Understanding your learners

- Multiple questions must be asked in order to best serve your learners...
 - Who is your target group?
 - What knowledge and skill do they possess now?
 - What profession(s) and discipline(s) do they represent?
 - What is there experience in simulation?
 - Why are they coming to the course?
 - What are their needs?
 - Are they similar or vastly different?
 - Should they be training together?



Slide 9

Determine course content

- Select main topics to be covered
 - Often named as competencies in nursing; milestones or entrustable professional activities in physicians
- Determine the structure of the course
 - Pre-course requirements
 - Didactics
 - Simulations
 - Debriefings
 - Hands-on practice
- Determine timing of the content



Slide 10

Determine course content

- Arrange topics in a logical order
 - Do the learners need one topic first in order to best learn another?
 - Can I organize the topics according to a theme or storyline?
 - Do I need to teach certain skills initially and then discuss applications?
 - Do I want to introduce a particular theory before illustrating it with specific examples or problems?



Slide 11

Develop instructional methods

- Consider the following:
 - What is your teaching style?
 - Which type(s) of instruction best fits the course goals?
 - What is the best setting for instruction?
 - How much time is needed for your method(s)?
 - Do you need a variety of methods to accomplish your goals?
 - Focus on methods that will require active learning



Slide 12

Adult learning theory

KNOWLES

4 PRINCIPLES OF ANDRAGOGY



1 INVOLVED ADULT LEARNERS
Adults need to be involved in the planning and evaluation of their instruction.

2 ADULT LEARNERS' EXPERIENCE
Experience is including knowledge provides the basis for the learning process.

3 RELEVANCE & IMPACT TO LEARNER'S LIFE
Adults are most interested in learning subjects that have immediate relevance and impact to their job or personal life.

4 PROBLEM-CENTERED
Adult learning is problem centered rather than content centered (Bridgely, 2013).



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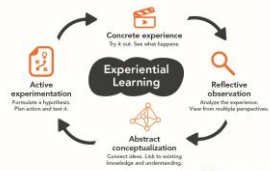
Adult learning theory

Pedagogy	Andragogy
Method of teaching children	Method of instructing adults
Learners are dependent	Learners are independent
Learners have less or no experience to share, thus teaching becomes didactic	Learners are experienced, hence instruction involves discussion, problem solving, etc.
Learners learn whatever the curriculum offers	The content has to be modified to the learners' needs
Teachers are required to direct the learners	Learners are self-motivated, but often need instructors to guide them
Learning is curriculum oriented	Learning is goal oriented

[illegible]

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Experiential learning

[illegible]

Slide 15

Determine evaluation options

- Consider your training “construct”, which includes learners, setting, topics, timing, methods and goals of the course
 - Is there a measure that fits this construct?
 - Do you need to develop a measure?
 - Do you need multiple measures?
- Will learners have a chance to practice all the behaviors included in the measure?
- Is this a low-risk or high-risk assessment?



Slide 16

Determine evaluation options

- Who will be doing the evaluation?
 - Learners
 - Instructors
 - 3rd-party evaluators; need for blinding
- Will training on measure application be needed?
- How will the evaluation measure be applied?
 - In-person
 - Video-based review
- How often will it be applied?
- What is the timing of the evaluation?



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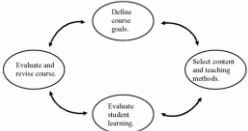
Piloting and revising the course

- Pilot each instructional method
 - Online module required before in-person attendance
 - Didactic lecture
 - Simulation scenarios
 - Debriefing style and formats
 - Especially important if having co-debriefers
 - Measures of outcome
- Recruit a representative sample of learners
 - Hand pick "champions" from the unit or department
- Revise the course based on these pilots



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Piloting and revising the course



Suggest evaluating and revising, if needed, at least annually



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Building a validity argument

- In order to make sound judgements, we need to *carefully understand the strengths and limitations of the course and processes upon which these decisions are based*
- Stated differently, we require evidence to support the validity of our decisions
- The process of collecting and interpreting validity evidence is called '**validation**'



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Building a validity argument

- Educators initially recognized two types of validity:
 - **Content validity** - relates to the creation of the assessment items
 - Flaw: Nearly always supported the test
 - **Criterion validity** - refers to how well scores correlate with a reference-standard measure of the same phenomenon
 - Obstacle: identifying and validating a reference standard is very difficult, especially for intangible attributes (e.g. professionalism).



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Building a validity argument

- Theorists proposed **construct validity**, in which intangible attributes (constructs) are linked with observable attributes based on a conception or theory of the construct
- Experts soon realized that all these different 'types' of validity, together with reliability metrics, ultimately had the common pathway of supporting (or refuting) the construct-related relationships



Slide 22

Building a validity argument

- This led researchers (as detailed by Messick) to abandon the different 'types' of validity *in favor of a unified framework in which **construct validity** (the only type) is supported by evidence derived from multiple sources*



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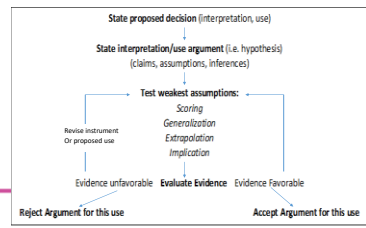
Building a validity argument

- The most recent evolution in validation theory, articulated by Kane, addresses the issue of prioritization by highlighting key phases or inferences in planning and evaluating the **validity argument**
- The beauty of Kane's framework is that it applies equally to an individual quantitative assessment tool, a qualitative assessment tool, or a program of assessment

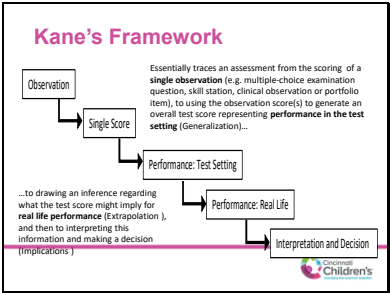


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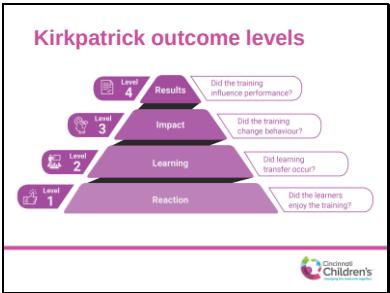
Building a validity argument



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Slide 26



Slide 27

	Kane	Kirkpatrick
Scoring	Single "scores" or observations, i.e. outcomes of pilot sessions Allows course revision	Reaction Helps you understand how course was received – engagement, relevance, satisfaction Helps you improve future courses
Generalization	Combined performance from text, i.e. simulation, setting sessions Allows further course revision	Learning KSA: Technical & Non-technical Helps you improve future courses
Extrapolation	Inference from simulation courses to real life setting Does the training change behavior at the bedside?	Impact Did they apply the learning, i.e. change behavior? Performance objectives, not learning objectives
Implications	Making a decision on whether the course is impactful? Should it continue? More revisions needed?	Results Return on investment (ROI) or return on expectations (ROE) What is the impact on patients?

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Program Development

- The development of simulation-based medical education (SBME) or simulation-based training (SBT) often moves slowly
- Initially, one course is developed and a selected set of scenarios are developed, piloted and implemented
- However, one course cannot cover the all the competencies required within complex, team-based management of patients



Slide 30

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Summary

- Course development takes time, effort, planning and willingness to continually revise and improve the experience for your learners
- Your learners are adults and the course needs to be adjusted to andragogy principles and support active learning
- Continue to build validity evidence for your courses, with the goal being positive impact at the bedside for pediatric patients and their families



Activity 3: SbCST Facilitator Training of Simulation Center Staff – example of team-based training session (current year fellow's name highlighted below to demonstrate his attendance and participation)

Overview for Internal (sim center) facilitator training for systems-based work in CCB

Cheryl, Brant and I met to discuss how and when we are going to train our education team for systems-based debriefing in prep for CCB work. Aimee has reviewed and approved our plan.

Here is a basic outline of the plan:

- November's journal review will be dedicated to this topic - this will replace the normal "pre-work" Cheryl and Brant require for the facilitator course [*this has been completed*]
- Over December the three of us will develop 4 scenarios, a facilitator guide for systems-based debriefing and a documentation guide to use during the debriefings
 - Arrest – Gary [*this has been completed*]
 - Altered Mental Status – Cheryl [*this has been completed*]
 - Shock – Brant [*this has been completed*]
 - Respiratory Failure – Cheryl [*this has been completed*]
 - Facilitator Guide – Gary [*this has been completed*]
 - Observer (Stakeholder) Guide – Gary [*this has been completed*]
- January staff meeting - 3 hours for in-person training
- March staff meeting - 3 hours for in-person training

White Board information – Schedule:

January 19, 2021:

Time	Group 1 (OR-3) - Brant	Group 2 (OR-1) - Cheryl
10:00 AM – 10:20 AM Scenario 1	Facilitator: Jamie Team: Sang, Gina, Michelle, Ben, Ken, Betsy, Ingrid	Facilitator: Rachel Team: Ryan, Gary, Shawn, Becca, Brenda, Amber, Aimee
10:20 AM – 11:00 AM	debriefing of scenario 1	debriefing of scenario 1
11:00 AM – 11:20 AM Scenario 2	Facilitator: Gina Team: Sang, Jamie, Michelle, Ben, Ken, Betsy, Ingrid	Facilitator: Becca Team: Ryan, Gary, Shawn, Brenda, Rachel, Amber, Aimee
11:20 AM – 12:00 PM	debriefing of scenario 2	debriefing of scenario 2

12:00 PM – 1:00 PM	Both groups in large classroom for lunch and discussion. <i>Box lunches provided by the Sim Center, but please bring a drink.</i>
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March 16, 2021:

Time	Group 1 (OR-3) - Brant	Group 2 (OR-1) - Cheryl
9:30 AM – 9:50 AM Scenario 3	Facilitator: Michelle Team: Sang, Gary, Jamie, Rachel, Betsy, Ingrid	Facilitator: Shawn Team: Ryan F., Ben, Becca, Brenda, Amber, Ken
9:50 AM – 10:30 AM	debriefing of scenario 3	debriefing of scenario 3
10:30 AM – 10:50 AM Scenario 4	Facilitator: Brenda Team: Ryan F., Sang, Ben, Gary, Jamie, Michelle, Rachel, Shawn, Becca Observers: Betsy, Ingrid, Amber, Ken	
10:50 AM – 11:30 PM	debriefing of scenario 4	
11:30 AM – 12:30 PM	Both groups in large classroom for lunch and discussion	

This format allows 7 different educators to practice facilitating using the PEARLS adaptation for systems debriefing. These will be “all hands on deck” sessions including the physicians, education specialists and the operations team. The VR/DX team does not need to attend...they are already working hard on the VR sessions for the CCB.