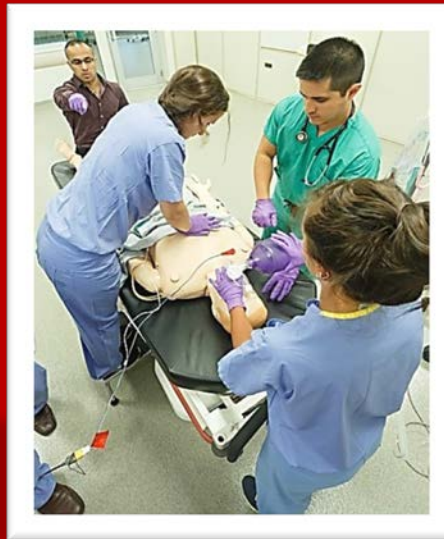


# Simulation in Medical Education: A Guide to Curriculum Design and Implementation



Clinical Skills Education and Assessment Center

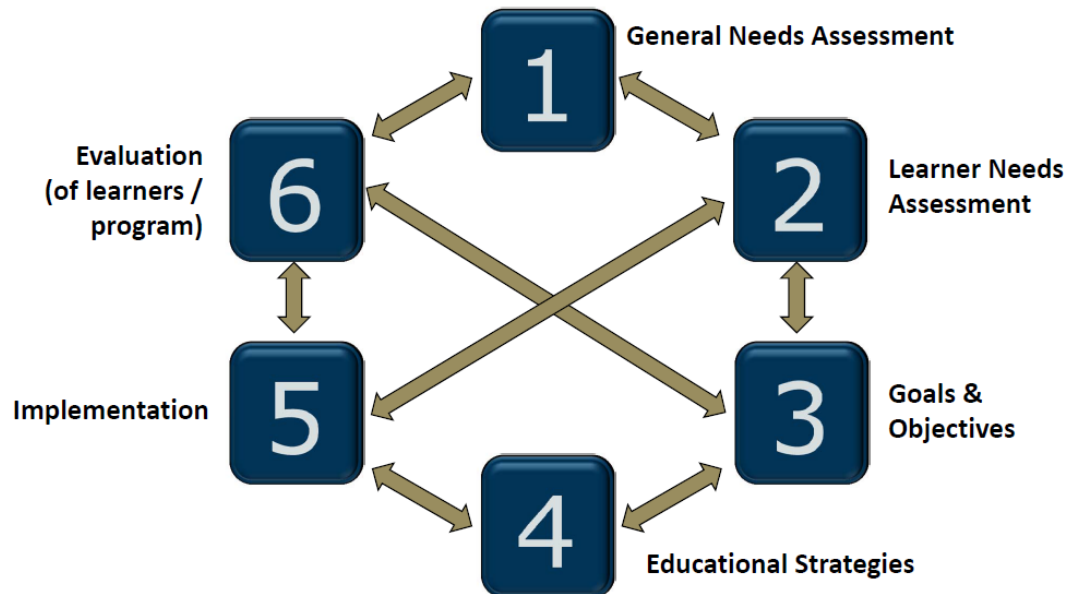


**THE OHIO STATE UNIVERSITY**  
COLLEGE OF MEDICINE

# Simulation Curriculum Development

Applying Kern's Six Steps to Curriculum Development

1. Problem Identification
2. Targeted Needs Assessment
3. Goals and Objectives
4. Educational Strategies
5. Implementation
6. Evaluation and Feedback



# 1. Problem Identification

- What are the **GAPS**?
  - What is happening vs What should be happening
    - Issues in the clinical environment
    - Missing curriculum components
    - Low test scores
    - Misunderstanding of material
    - Related to communication, skill development, knowledge retention, etc?
- ✓ These gaps will help to form the overall topics and goals for your simulation scenarios



## 2. Targeted Needs Assessment

- **Understand the Problem**
  - What's the Background?
  - Ask WHY
  - Speak with both instructors/managers AND learners
  - What are the Expectations?
- **Understand the Learners**
  - What do they know, what do they need to know, what is their perception of how they are taught?
    - Questionnaires, Interviews, Observations, Test Scores
- ✓ **This will help you develop simulations that are meaningful learning experiences with goals and objectives that better address the problem**

# 3. Goal and Objectives

- What's the goal?
  - What is the desired end result (broad)
    - Typically related back to the problem
  - Must be SMART



# 3. Goal and Objectives

- **What's the objective?**
  - What do you want your learners to accomplish during the simulation
    - Directly related to your goal
    - This drives EVERYTHING!
- **How to write objectives**
  - Must be specific and measurable
  - Include 5 elements:
    - 1. Learner (who)
    - 2. Verb
    - 3. Criteria
    - 4. Noun
    - 5. Conditions of the performance
  - **Who will do how much (how well) of what by when?**



# 3. Goals and Objectives

- How to write objectives cont.
  - Choose the appropriate Verb
    - Cognitive (knowledge)
      - Identify, Define, Recite, Recognize, Describe, Explain, Apply, Analyze, Illustrate, Assess
    - Affective (attitude):
      - Listen, Gives, Understands, Discuss, Appreciate, Relate, Questions, Verifies, Revises
    - Psychomotor (skill/behavior)
      - Demonstrate, Incorporate into Performance, Use, Show, Diagnose, React, Respond, Constructs, Measures, Changes
  - 3-5 objectives per scenario will maintain facilitator and learner focus

## 4. Educational Strategies

- How will the objectives be achieved through Simulation?
  - 1. Content
    - Derived from the nouns listed in the objectives
    - Set the scene of the scenario
    - Use the **Scenario Development Form** as a guide
    - What prerequisites are required of the learner?
  - 2. Method
    - Which method will lead to achieving the objectives?
      - Task Training
      - Standardized Patient
      - Low vs High Fidelity Simulation
      - A combination of the above
  - Consider time, space, and resources!

## 4. Educational Strategies

- When choosing Simulation, consider...
  - Simulation Sequence
    - Set-up: 5 minutes - 1 hour!
    - Intro to simulator: 5 minutes
    - Simulation: 10 minutes
    - Debrief: AT LEAST 10 minutes
    - No more than 5 learners per group!
  - A marathon, not a sprint...
    - Development: Meeting & Form Completion (3-4 hours)
    - Preparation: Program & Supplies/Equipment (1-3 hours)
    - Practice: with ALL Facilitators (1 hour)
- Contact an Education Resource Specialist for support [jessica.liddil@osumc.edu](mailto:jessica.liddil@osumc.edu)



**30 minutes per  
scenario per  
group**



# 5. Implementation

- **Identify Resources (Time, Space, Personnel, Cost)**
  - One appropriate facilitator per simulation/activity
    - Knowledgeable on the subject matter
    - An active member of the learner's field
    - An understanding of the Simulation Process
    - Typically NOT a direct peer/co-worker
  - **Accurate Clinical Representation**
    - Environment-Simulation Lab or Workplace
    - Equipment/Supplies- same as in clinical practice
      - Ex. drug labels, crash cart, etc.
    - Time Frame- when to “fast forward”
      - Ex. Progression of illness, Labs/Imaging Results

For scheduling space and obtaining cost estimates, contact Kelli Kaiser ([kelli.kaiser@osumc.edu](mailto:kelli.kaiser@osumc.edu))

# 5. Implementation

- Obtain Support
  - Internal: faculty, learners, administration
  - External: Professional Societies, foundations, funding resources
- Develop Administrative Mechanisms to Support the Curriculum
  - Research?
    - An IRB approval letter must be kept on file at CSEAC
  - Communicate schedule to learners and faculty
  - Arrange space, materials, and instructors
- Anticipate and Address Barriers
  - Financial, Competing Demands, People

# 5. Implementation

- **Plan to Introduce Curriculum**
  - **Pilot First:** We recommend and practice session 2 weeks prior to a session
  - **Create Learner “Buy In” (aka Engaged Learners):**
    - Why are they required to participate?
    - What will they get out of the experience?
    - How does the scenario impact them?
      - Work to solve a problem occurring in the workplace?
    - Is this for purposes of evaluation or learning?
  - **Phase In:** For large curriculums, start small, obtain feedback/evaluations then fully implement



# 6. Evaluation and Feedback

- Closes the loop in the curriculum development cycle
  - Were the goals and objectives of the curriculum met?
  - Were the gaps filled in?
  - What did the learners gain?
- Evaluation Methods
  - Cognitive (Knowledge): written/oral exams
  - Affective (Attitudes): surveys/questionnaires, group/individual interviews, self assessment/reflection
  - Psychomotor (Skill/Performance): direct observation, performance audits, self-assessment
- Evaluation Instruments
  - Validity, Reliability, Bias
  - Consider length and amount of time required for completion



## 6. Evaluation and Feedback

### ■ Simulation Evaluation

- Evaluation is highly encouraged at CSEAC
- Each learner will complete a Simulation Experience Survey following every session at CSEAC
  - Results will be sent to facilitators within one week of the session

### ■ Feedback

- Formative: to improve performance for the purposes of learning/improvement
- Summative: to assess performance for the purposes of a grade/promotion/certification

### ■ In simulation, it's all about the debrief!

# 6. Evaluation and Feedback

## ■ Why Debrief?

- This is where the learning takes place!
  - Discuss mistakes
  - Answer questions
  - See things from the learners' point of view
  - Provide information on best practice, technique, ect.

## ■ Simulation Debrief

- Should occur IMMEDIATELY following the simulation
- Should last AT LEAST as long as the simulation itself (typically 10-15 minutes)
- Not a lecture, a discussion!
  - What do you think went well?
  - What do you think didn't go well? Why?

## 6. Evaluation and Feedback

### ■ T.O.F.E Debrief Tool

- Used by the facilitator during the simulation to aid the debrief discussion
- **TARGET:** What are the objectives?
- **OBSERVED:** What is observed during the simulation in relation to each objective?
- **FEEDBACK:** For the learner, specific to the objective & what was observed. What went well, what didn't, and suggestions for improvement
- **EXPLORE:** Questions to ask the learner regarding their thought process and performance to better understand their perspective, actions, gaps, or errors.

# Summary

- Applying Kern's 6-step method to simulation curriculum can help you develop quality, objective-based simulations that will enhance learning
- Want to learn more??? Faculty Development Courses are COMING SOON!
- For scheduling, contact Kelli Kaiser at [Kelli.Kaiser@osumc.edu](mailto:Kelli.Kaiser@osumc.edu)
- For curriculum development, contact Jessica Liddil at [Jessica.Liddil@osumc.edu](mailto:Jessica.Liddil@osumc.edu)

# Faculty Resources

- Kern DE, et al: Curriculum Development for Medical Education – A Six-Step Approach. Baltimore: The Johns Hopkins Univ. Press. 1998
- Rudolph, J. W., Simon, R., Raemer, D. B. and Eppich, W. J. (2008), Debriefing as Formative Assessment: Closing Performance Gaps in Medical Education. Academic Emergency Medicine, 15: 1010–1016. doi: 10.1111/j.1553-2712.2008.00248.x
- Waller, K. Writing Instructional Objectives. NAACLS. <http://www.naacsls.org/docs/announcement/writing-objectives.pdf>