Evidence, Principles, and Theories Applied to Design and Delivery of Online Learning

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Agenda

- Welcome and introductions (5 minutes)
- Background on online learning (20 minutes)
 - Raise your hand if you want to say something
 - In chat, please add challenges, successes, questions
- Large group discussion (30 minutes)
- Concluding thoughts (5 minutes)
- After this session, participants will be able to:
 - Identify challenges in design and delivery of online learning
 - Discuss an approach to developing online curricula
 - Define tactics that are applicable to daily practice in medical education

My background

- General internist
 - Inpatient clinical teaching
 - Independent hospitalist practice
- Faculty development
 - Teach curriculum development at Johns Hopkins
 - Mentor on research and program development
- Education scholarship/research
 - Technologies, well-being, accreditation
- Curriculum development
 - 6 Steps Online
 - Fundamentals of teaching and learning



JOHNS HOPKINS school & medicine



Med Ed Curriculum Development ID: E-006RVJ Instructors: B. Chen, B. Chen, S. Tackett, D. Kern, S. Burns - Language: English

JT THIS COURSE CONTENT ADDITIONAL INFORMATIO

The Six-Step Approach was developed at Johns Hopkins to be a practical model for creating curricula in medical education. Since 1987, It has been used as the basis for a longitudinal training program where over 300 Johns Hopkins faculty and fellows have developed and implemented more than 130 curricula. Through over 130 workshops and a textbook now in its 3rd edition, the Six-Step Approach has reached many more educators worldwide. In this introductory course, we hope to familiarize you with the basics of curriculum development so that you can begin to think of ways to improve existing curricula or advance new curricular ideas. Completion of this course will provide the necessary foundation for the additional training needed to develop true curriculum development expertise.

FUNDAMENTALS of TEACHING and LEARNING in the HEALTH PROFESSIONS



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How I think about learning, teaching, & curriculum

Learning = changes in knowledge, attitudes, or skills that allow someone to do something better

Teaching = facilitating learning

Curriculum = any planned educational experience Auscultation i an important part of a KNOWLEDGE patient's assessment KNOWLEDGE ATTITUDE ENVIRONMENT HABITS & SKILL SKILLS ATTITUDE Hand hygiene is necessary for ALL visits. BEHAVIORS BEHAVIOR CHANGE



Figure 1 Considerations for online curriculum development according to the Six-Step Approach for Curriculum Development for Medical Education.

Learning environment How does learning happen? (safe, supportive) GREATER RETRIEVAL GREATER APPLICATION GREATER STORAGE GREATER FOCUS to REAL- WORLD **# SELF- DIRECTED # ASSESSMENT &** # ELABORATIVE SITUATIONS FEEDBACK LEARNING INTERROGATION * CONCRETE * SPACED REPETITION # PEER LEARNING INTERLEAVING EXAMPLES # METACOGNITION *** TESTING EFFECT** * ADAPTIVE SHORT TERM/ LEARNING WORKING MEMORY * GAMIFICATION LONG TERM MEMORY * ADAPTIVE TEACHING LESS INFO to FILTER Rest * MULTIMEDIA \$PETRIAL DIALTOLAL + LEARNING SENSORY MEMORY TRANSFER PATIENT NOTES: PHYSICAL EXAMINATION PROCEDURE INTRESSIONS. CARLIER DEVELT RECOMMENDATIONS FURTHER TEATS, INSINGLINES? SMOSIS.org

Rest and learning: Default Mode Network



Rest and learning: Default Mode Network



Evidence-based tips

Table 4. Utility Assessment and Ratings of Generalizability for Each of the Learning Techniques

Technique	Utility	Learners	Materials	Criterion tasks	lssues for implementation	Educational contexts
Elaborative interrogation	Moderate	P-I	Р	I	Р	I
Self-explanation	Moderate	P-I	Р	P-I	Q	I
Summarization	Low	Q	P-I	Q	Q	I
Highlighting	Low	Q	Q	Ν	Р	N
The keyword mnemonic	Low	Q	Q	Q-I	Q	Q-I
Imagery use for text learning	Low	Q	Q	Q-I	Р	I
Rereading	Low	I	Р	Q-I	Р	I
Practice testing	High	P-I	Р	Р	Р	Р
Distributed practice	High	P-I	Р	P-I	Р	P-I
Interleaved practice	Moderate	I	Q	P-I	Р	P-I

Note: A positive (P) rating indicates that available evidence demonstrates efficacy of a learning technique with respect to a given variable or issue. A negative (N) rating indicates that a technique is largely ineffective for a given variable. A qualified (Q) rating indicates that the technique yielded positive effects under some conditions (or in some groups) but not others. An insufficient (I) rating indicates that there is insufficient evidence to support a definitive assessment for one or more factors for a given variable or issue.

Evidence-based tips: 6 you can believe in

- <u>Testing</u>
 - Works even before you're taught anything
- <u>Spaced repetition</u>
 - Spacing at increasing intervals improves retention
 - Especially good when combined with testing
- Interleaving
 - Mixing (not blocking) concepts/topics
 - Hard; can impair short term results but amazing for long term results
- Elaborative interrogation
 - Connecting new knowledge with existing/ making it your own
 - Explaining, drawing, etc
- <u>Concrete examples + abstract concepts</u>
 - Need both
- <u>Multimedia principles</u>
 - Pictures and words can be synergistic
 - Lots of "principles" available for guidance

What's different about online?

- Good things
 - Potentially accessible by anyone, anywhere, any time
 - Opportunity for more individualization and standardization
 - Virtually unlimited array of multimedia available
 - More options for testing/assessment/retrieval practice
- Limitations
 - Requires devices and online access
 - Educational planning more complex, must accommodate diversity of learners
 - Unfamiliar to many educators and learners
 - Technology-mediated interactions and relationships

What's different about online?







Zoom Fatigue?



Zoom fatigue: 4 explanations

- Eye gaze at a close distance (think elevator)
 - Increased sizes of faces
 - More time looking directly at people
- Cognitive load
 - More effort sending non-verbal cues
 - More effort interpreting non-verbal cues
 - (Verbal cognitive load, slight delays in timing)
- An all day mirror
- Reduced mobility



2021 The Author(s)



Technology, Mind, and Behavior

Nonverbal Overload: A Theoretical Argument for the Causes of Zoom Fatigue

Jeremy N. Bailenson Department of Communication, Stanford University

https://doi.org/10.1037/tmb0000030

Key challenges with asynchronous learning

- Navigation of content/platform
- Relevance for all learners
- Learner:
 - Motivation
 - Time
 - Attention



Large group discussion

- Challenges
- Successes
- Questions

Online learning: concluding thoughts

- Tremendous potential
- Principles of face to face learning still apply
 - Alignment among needs, learning objectives/outcomes, educational strategies, assessment/evaluation strategies, available resources is more important than using a new model (e.g. flipped classroom) or new method
 - Active learning > passive learning
 - Desirable difficulties -> testing, retrieval practice
 - Interaction/discussion > watching videos
 - Need a safe, supportive learning environment
 - Learner motivation and freedom to fail are critical
 - Relationships are important
- Understanding how technology helps or harms can help you make best use

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