FROM THEORY TO PRACTICE: EVIDENCE-BASED STRATEGIES FOR DESIGNING AND DEVELOPING ENGAGING ONLINE COURSES

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CONTENTS

Think back for a minute on your time as an undergraduate or even a law student. Some of you may remember rushing to your nine o'clock seminar in a classroom or lecture hall with a whiteboard or maybe even a projector. Or hustling to meet your professor in her office hours for fear of missing out on a chance to review a difficult assignment. Do you remember hoarding quarters or filling up a copier card to make personal copies of a sought-after journal article that you found in the card catalog? How about circling the parking lot trying to find a spot for your afternoon class?

I can certainly relate. I was finishing my undergraduate degree in computer science when I got my first email address; and while I was working on my graduate degree in educational psychology, my classes began to take advantage of something called the World Wide Web. But even as I was studying about the effective uses of technology in education, it was difficult to imagine it happening outside of the classroom with

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ten or more other graduate students. Certainly, I could not have understood what it truly meant to work with a public school teacher in the Rio Grande Valley, a member of the Coast Guard who was deployed to a remote part of the globe, or an educator who continued her studies while living through Hurricane Maria in Puerto Rico. But twenty years later, that is an exact sample of the students I teach from my office in Texas.

The fact that online learning in higher education is exploding at a rapid pace isn't a surprise. Recent numbers indicate that more than 30% of students (6,359,121 students nationwide) are enrolled in at least one distance course, an increase of 5% over the previous year, and nearly 15% of students take courses exclusively at a distance.[1] Colleges and universities are offering more online courses to meet the needs of their students as well as increase reach and revenue opportunities.[2] It's been long touted that technology has the potential to transform education just as it has revolutionized every aspect of our professional and personal lives.[3] The way we collaborate on projects, conduct research, pay our taxes, get a ride, or order lunch has been changed forever by online technologies.

But the same revolution has yet to happen in education.[4] Too many of our online instructional practices hearken back to the day when I was hoarding quarters for the copier machine (for example, long pre-recorded lectures and multiple-choice quizzes).[5] As a result, students in online courses often feel isolated and lack the built-in community of traditional, face-to-face courses.[6] This can impact student satisfaction, learning outcomes and completion rates.[7] Such disengagement poses a great chal-

1. JULIA E. SEAMAN, I. ELAINE ALLEN & JEFF SEAMAN, GRADE INCREASE: TRACKING DISTANCE EDUCATION IN THE UNITED STATES 11–12 †2018).

2. *See* Mark G. Angolia & Leslie R. Pagliari, *Factors for Successful Evolution and Sustainability of Quality Distance Education*, 19 ONLINE J. DISTANCE LEARNING ADMIN. (2016).

3. *See id*.

4. *See* GEORGE SIEMENS, DRAGAN GASEVIC & SHANE DAWSON., PREPARING FOR THE DIGITAL UNIVERSITY: A REVIEW OF THE HISTORY AND CURRENT STATE OF DISTANCE, BLENDED, AND ONLINE LEARNING 12 (2015); *see also* Francoise Blin & Morag Munro, *Why Hasn't Technology Disrupted Academics' Teaching Practices? Understanding Resistance to Change Through The Lens of Activity Theory*, 50 COMPUTERS & EDUC. 475, 476 (2018).

5. *See* SIEMENS, GASEVIC & DAWSON, *supra* note 4, at 15–16.

6. *See* Jenna Gillet-Swan, *The Challenges of Online Learning Supporting and Engaging the Isolated Learner*, 10 J. LEARNING DESIGN 20, 21–22 (2017).

7. *See id.* at 22; Andrew William Cole & Kristine M. Nicolini, *Student Predisposition to Instructor Feedback and Perceptions of Teaching Presence Predict Motivation Toward Online Courses*, 21 ONLINE LEARNING J. 245, 255 (2017); Jennifer C. Richardson & Karen Swan, *Examining Social Presence in Online Courses in Relation to Students' Perceived Learning and Satisfaction*, 7 J. ASYNCHRONOUS LEARNING NETWORKS 68, 68–69 (2003); Tracy Russo & Spencer Benson, *Learning with Invisible Others: Perceptions of Online Presence and their Relationship to Cognitive and Affective Learning*, 8 EDUC. TECH. & SOC'Y 54,

lenge for online educators. As instructors, how can we help students succeed in the online environment? The way we approach the design of instruction as well as the facilitation of the course can have a huge impact on students' satisfaction and performance.[8] The key is applying what we have learned from decades of research that was refined in traditional classroom instruction and implementing the techniques in a way that acknowledges the constraints and capitalizes on the features of the online environment.

I. THEORETICAL APPROACHES TO LEARNING

So what have educational psychology researchers determined about how people learn? What do we know about this complex process? Understanding the foundations of how learning processes take place helps us determine and select the most effective instructional strategies.[9] Let's start with a quick overview of the major theoretical approaches to learning:

A. Behaviorism

Behaviorism views learning as "changes in either the form or frequency of observable performance."[10] The focus is on the stimulus-response connection.[11] Present a particular stimulus and the appropriate response should be demonstrated.[12] A classic example is the use of flashcards to learn math equations.[13] If a child has *learned* the appropriate information, when she is shown "2 + 4 =" her immediate response should be "6."[14] Our goal as educators is to strengthen the stimulus-response connection using appropriate reinforcement.[15] Instructional strategies based on the behaviorist approach include using pre-assessments to determine students' current skill level, lectures, drill-and-practice activities, and immediate feedback.[16] Behaviorism views the learner as more of a passive recipient of information, as opposed to an active participant in the

54 (2005).

8. Russo & Benson, *supra* note 7, at 55, 58–59.

9. Peggy A. Ertmer & Timothy J. Newby, *Behaviorism, Cognitivism, Constructivism: Comparing Critical Features from an Instructional Design Perspective*, 6 PERFORMANCE IMPROVEMENT Q. 50, 50–51 (1993).

10. *Id*. at 55.

11. *Id.*

12. *Id.*

13. *Id.*

14. Ertmer & Newby, *supra* note 9, at 55.

15. *See id.*

16. *See id.* at 56.

process.[17] The behaviorist approach to learning is most useful for teaching basic, foundational concepts.[18]

B. Cognitivism

In contrast, the cognitive approach to learning emphasizes the internal processes that take place, in addition to the observable output.[19] The focus is on "problem solving" and "information-processing."[20] Learners are viewed as active participants in the process and the prior knowledge they bring to a situation, their experiences, and what they do with the new information will affect how they learn the new information.[21] So one of the overarching goals of cognitive theory is to *link* new information to the learner's prior knowledge.[22] Cognitivism asserts that our short-term or working memory is limited and we need to move the information to long-term memory.[23] Knowledge structures stored in long-term memory are organized through meaningful connections.[24] Stronger connections exist among more closely related pieces of information.[25] The more connections you have, the more pathways you have to retrieve that information.[26] Our goal as educators is to help students move the information into long-term memory and to strengthen the connections among information.[27] Students should be encouraged to use appropriate learning strategies, such as organizing the information, and evaluating information in order to develop knowledge.[28]

In contrast to behaviorism, students' beliefs, attitudes, and values also play a significant role in the learning process.[29] Instructional strategies should help the learners structure and assimilate the new information by using techniques such as advance organizers, connecting the new information to students' prior knowledge, providing real-world examples, giving explanatory feedback, assisting students in self-monitoring of their

17. See *id.* at 55.
18. See *id.* at 56.
19. *See* Ertmer & Newby, *supra* note 9, at 58.
20. *Id.* at 59.
21. *See id.* at 58.
22. *See id.* at 60–61.
23. *See* Nelson Cowan, *Working Memory Underpins Cognitive Development, Learning, and Education*, 26 EDUC. PSYCHOL. REV. 197, 197 (2014).
24. *See id.* at 212.
25. *See* Ertmer & Newby, *supra* note 9, at 60.
26. *See id.* at 60–61.
27. *See id.* at 60.
28. *See id.* at 59.
29. *See id.*

learning process, etc.[30]

C. Constructivism

The constructivist approach to learning proposes that individuals create their own knowledge through experience.[31] The context of where the learning takes place is key, so the goal is to strive for authentic settings and real-world contexts.[32] The emphasis is not on information retrieval, but rather on constructing a "novel" solution to a problem by assembling various pieces of information.[33] Instructional strategies that grew out of this approach include modeling, coaching, collaborative learning, questioning strategies, problem-based learning, guided discovery, reflective exercises, apprenticeships, internships, etc.[34]

You will notice that the various approaches to learning—behaviorism, cognitivism, and constructivism—shift the role of the learner from passive to active and shift the role of the instructor from more of a lecturer to a facilitator.[35] It is important to note, however, that one perspective is not necessarily "better" than another. Rather, each of these theories can be effective and appropriate depending on your instructional objectives.[36] Behavioral strategies are useful for foundational concepts, while cognitive and constructivist approaches are helpful to teach more advanced concepts.[37]

II. DESIGNING FOR ONLINE LEARNING

These same principles of learning hold true in online environments as well, though the specific instructional techniques typically must be adjusted and refined.[38] The key is determining what your instructional objectives are (i.e., what do you want your students to be able to do after participating in the instruction?) and choosing appropriate instructional

30. *See generally* Ertmer & Newby, *supra* note 9; *see also* SCOTT MCQUIGGAN ET AL., MOBILE LEARNING: A HANDBOOK FOR DEVELOPERS, EDUCATORS, AND LEARNERS (2015).

31. *Bednar, A. Cunningham, D., Duffy, T., & Perry, J.*, Theory into practice: How do we link?, *in* INSTRUCTIONAL TECHNOLOGY: PAST, PRESENT, AND FUTURE (G.J Anglin, ed., 1st ed. 1991).

32. *See id.* at 68.

33. *See* Ertmer & Newby, *supra* note 9, at 65.

34. *See id.*

35. *See id.* at 66.

36. *Id.*

37. *Id.*

38. *See* Janet R. Buelow, Thomas Barry & Leigh E. Rich, *Supporting Learning Engagement with Online Students*, 22 ONLINE LEARNING J. 313, 330–31 (2018).

strategies targeting each of the objectives.[39] For example, quizzing students over historical facts (a behaviorist approach) is fairly simple to implement online while providing a well-designed collaborative group activity (a constructivist approach) may take a bit more time. The goal is to design efficient and engaging courses without losing creativity and hands-on learning within the classroom . . . even the online classroom.

A. Building Community Online

Building community is especially important in the online environment. When I meet with faculty members who have never taught online, one of their main concerns is not feeling "connected" to their students.[40] Students also seek "connection" in online learning environments—connection with other students, the instructor, and the content.[41] As an instructor, creating activities that encourage the learner to interact with peers can stimulate active learning and help build community among students.[42] I am fortunate to teach at a university that is well-known for its sense of community and tradition. When we developed our fully online graduate program, one of our goals was to replicate this sense of community online. Most of our students travel to campus and meet each other face-to-face for the first time at graduation. Seeing their excitement as they greet the faculty and each other with hugs is a testament to the ability to connect with your students online.

The Community of Inquiry ("CoI") framework is a popular model for examining online learning and is useful for selecting and implementing strategies specifically designed to promote community in online environments.[43] The framework assumes that learning takes places through the interaction of three core elements within the online community—social presence, teaching presence, and cognitive presence.[44]

The theory of social presence can be traced back to Short, Williams, and Christie who defined the term as "the degree of salience of the other person in the interaction and the consequent salience of the interpersonal

39. MARGARET D. ROBYLYER, INTRODUCTION TO SYSTEMATIC INSTRUCTIONAL DESIGN FOR TRADITIONAL, ONLINE, AND BLENDED ENVIRONMENTS (Pearson ed., 2014).

40. *See* Buelow, Barry & Rich, *supra* note 38, at 315.

41. *See id*.

42. *See id.* at 327.

43. *See* D. Randy Garrison, Terry Anderson & Walter Archer, *Critical Inquiry in a Text-Based Environment: Computer Conferencing in Higher Education*, 2 INTERNET & HIGHER EDUC. 87, 88 (2000) [hereinafter Garrison, Anderson & Archer, *Critical Inquiry*]; *see also* D. Randy Garrison, Terry Anderson & Walter Archer, *The First Decade of the Community of Inquiry Framework: A Retrospective*, 13 INTERNET & HIGHER EDUC. 5, 6 (2010) [hereinafter Garrison, Anderson & Archer*, The First Decade*].

44. *See* Garrison, Anderson & Archer, *Critical Inquiry*, *supra* note 43.

relationships."[45] Garrison, Anderson, and Archer defined it as the students' ability to "project their personal characteristics into the community, thereby presenting themselves to the other participants as 'real people.'"[46] In other words, social presence is the "feeling [of being] emotionally connected to another intellectual entity through computer-mediated communication."[47]

1. Example Strategies for Enhancing Social Presence:

Beginning of course:

- Creating icebreaker activity that encourages students to get to know a bit about each other
- Responding to all introductions and finding common connections
- Addressing students by name

During course:

- Using collaboration tools in peer-to-peer learning groups
- Giving timely and personal feedback
- Using screen casting software to provide personalized audio and video feedback
- Using media tools to enhance online discussions

End of Course:

- Providing opportunity for students to say goodbye, provide reflections, and discuss future plans

The second element in the framework—teaching presence—includes the design of the learning activities and assessments as well as the facilitation of the course.[48] Teaching presence "support[s] and enhance[s] social and cognitive presence for the purpose of realizing educational outcomes."[49] Characteristics of teaching presence include clearly communicating course expectations and effectively guiding and facilitating student discussions.[50]

2. Example Strategies for Enhancing Teaching Presence:

Beginning of course:

45. JOHN SHORT, EDERYN WILLIAMS & BRUCE CHRISTIE, THE SOCIAL PSYCHOLOGY OF TELECOMMUNICATIONS 65 (1976).

46. Garrison, Anderson & Archer, *Critical Inquiry*, *supra* note 43, at 89.

47. Eunmo Sung & Richard E. Mayer, *Five Facets of Social Presence in Online Distance Education*, 28 COMPUTERS HUM. BEHAV. 1738, 1738–39 (2012).

48. *See* Garrison, Anderson & Archer, *Critical Inquiry*, *supra* note 43, at 90.

49. *Id.*

50. *See id.* at 89.

- Sending welcome email to students outlining course start date, required materials, and how to access online course
- Giving overview video(s) of Learning Management System (LMS) interface, syllabus, and course expectations
- Giving ample time for introductions and learning course navigation

During course:

- Designing weekly activities that require interaction
- Providing a variety of activities week-to-week
- Providing weekly wrap-up of activities and/or discussion

Finally, the third element in the framework, cognitive presence, refers to the ability to "construct meaning through sustained communication."[51] This element focuses on critical thinking and practical inquiry beyond individual learning outcomes.[52] The critical thinking perspective includes creativity, problem solving, and reflection.[53]

3. Example Strategies for Enhancing Cognitive Presence:

- Offering opportunities for debate, defending arguments, providing support for ideas
- Developing meaningful assessments
- Providing a variety of sources and activities
- Modeling consideration for alternative viewpoints
- Modeling critical thinking & reflection

You will notice that each of the recommended strategies for enhancing social presence, teaching presence, and cognitive presence falls on the continuum ranging from a behaviorist approach to a constructivist approach.[54] Each of the elements overlap and interact to support the online educational experience. Keeping social presence, teaching presence, and cognitive presence in mind as you design an online course should improve learning outcomes as well as student satisfaction.[55]

51. *Id.*

52. *See id.*

53. *See* D. Randy Garrison, Terry Anderson & Walter Archer, *Critical Thinking, Cognitive Presence, and Computer Conferencing in Distance Education*, 15 AM. J. DISTANCE EDUC. 7, 8 (2001).

54. *See generally* Ertmer & Newby, *supra* note 9, at 55–63 (explaining the various approaches and discussing their differences).

55. *See* Richardson & Swan, *supra* note 7, at 73; Garrison, Anderson & Archer, *Critical Inquiry*, *supra* note 44.

III. DESIGNING FOR ACTIVE LEARNING

While we have discussed general strategies related to structuring a course and communicating within the course, what specific techniques can we use to support active learning in online environments? Designing an online course to require interactive engagement from all students supports all three elements of the CoI model.[56] When a faculty member is first asked to move a course online, often times his initial thought is to record his lectures and post the videos and slide presentations online. This rather passive approach to the learning process tends to lead to the cited drawbacks of online learning, including feelings of isolation, boredom, and high dropout rates.[57] Active learning strategies require the learner to *do* something beyond reading, writing, and answering.[58] We want students to think creatively—generate new ideas, combine existing concepts in a new way, create something new, etc.[59] These outcomes can be accomplished at the individual or group level.[60]

How might you accomplish this in a traditional face-to-face classroom? You might use problem-based activities, case studies, debates, or have the students create a project.[61] With appropriate attention to design, you can accomplish the same goals in an online course. It often helps to simply break the full class into smaller groups for more individual participation.[62] Instructors can use the Groups function in the LMS or assign groups or partners directly in the main discussion forum. Assigning specific roles to students is useful for debates or case study activities. For example, you might assign one member the role of asking questions or another member to play the "devil's advocate" in the discussion. You may also choose to include peer-reviewed activities. When assigning students to review the work of other students, it is helpful to provide feedback guidelines (or what elements you as the instructor would be looking

56. *See* Tracy Russo & Spencer Benson, *Learning with Invisible Others: Perceptions of Online Presence and their Relationship to Cognitive and Affective Learning*, 8 EDUC. TECH. & SOC'Y 54, 59 (2005).

57. *See* Michele T. Cole, Daniel J. Shelley & Louis B. Swartz, *Online Instruction, E-Learning, and Student Satisfaction: A Three Year Study*, 15 INT'L REV. RES. OPEN & DISTANCE LEARNING 111, 123–24 (2014); Richardson & Swan, *supra* note 7, at 69; Russo & Benson, *supra* note 57, at 54.

58. *See* Buelow, Barry & Rich, *supra* note 38, at 322–23.

59. *See id.*

60. *See generally* R. KEITH SAWYER, EXPLAINING CREATIVITY: THE SCIENCE OF HUMAN INNOVATION (2d ed. 2012) (discussing cognitive neuroscience studies through, among other means, a psychological approach).

61. *See* Ertmer & Newby, *supra* note 9, at 60.

62. *See* Jenna Gillett-Swan, *The Challenges of Online Learning: Supporting and Engaging the Isolated Learner,* 10 J. LEARNING DESIGN 20, 23 (2017).

for if you assessed the assignment).[63]

To create more engagement, discussion activities should go beyond eliciting opinions.[64] The activities should connect to real-world experiences and require the learners to apply the information.[65] For example, in an Emerging Technologies course that I teach, the students read case studies describing the implementation of technology solutions in various contexts. The students are asked to connect one of the "Lessons Learned" with their own experiences. When we discuss the rise of micro-credentialing in higher education, the students are assigned to take one of the lessons from their own work and "gamify" it using a badging approach. Redesigning discussion activities in this way requires no additional technology or setup time but usually results in a higher degree of learner engagement.

Students also tend to be more engaged when they have some choice in the assignment or the product produced.[66] This technique can range from the very simple—providing several discussion prompts and allowing the student to pick one—to more complex, such as allowing the students to choose the type of deliverable that will be produced.[67] In addition to traditional papers, I have had students submit assignments as videos, interviews, infographics, slide presentations—even an original recorded song! When it is appropriate to allow this level of freedom, it taps into the students' creativity and their own skillset—not to mention allows them to explore the technology at their fingertips. There are a variety of free, easy-to-use technology tools that both instructors and students can use to add interactivity—integrating one or more can add variety to text-heavy discussions and enhance social, teaching, and cognitive presence.[68]

Online productivity tools, such as G Suite (formerly Google Apps), support group collaboration.[69] Tools such as VoiceThread are useful for having debates or discussions around particular pieces of media.[70] This particular tool allows students to record and leave video and audio com-

63. *See* Peggy A. Ertmer et al., *Using Peer Feedback to Enhance the Quality of Student Online Postings: An Exploratory Study*, 12 J. COMPUTER-MEDIATED COMM. 412, 429 (2007).

64. *See* Buelow, Barry & Rich, *supra* note 38, at 329.

65. *See* Sung & Mayer, *supra* note 47, at 1746.

66. *See* Buelow, Barry & Rich, *supra* note 38, at 327.

67. *See id.* at 327–28.

68. *See* Appendix.

69. *See* G-Suite, *Features*, GOOGLE (last visited Aug. 24, 2019), https://gsuite.google.com/features/.

70. *See Features*, VOICETHREAD (last visited Aug. 24, 2019), https://voicethread.com/about/features/.

ments so it gives a bit more personalization beyond the text-based discussions.[71] Easy-to-use tools such as Padlet and Popplet are concept mapping apps that allow students to organize information and brainstorm new ideas, individually and collaboratively.[72] Social bookmarking tools such as Diigo and Evernote allow students to curate, annotate, and combine web-based resources for a particular purpose.[73] Tools like Adobe Spark and Canva are easy-to-use graphic design tools that allow students to create professionally designed videos, web pages, and infographics.[74] Flipgrid allows students to post video reflections and peer comments using their mobile devices.[75] Each of these student-created products can be shared and discussed within the LMS discussion forums.

These technology tools can be used in a variety of ways to support active learning. For example, instructors might use the technology to:

- Provide introduction/summary of material
- Implement formative/summative assessments

Or you might ask students to create a product to:

- Demonstrate understanding of content
- Illustrate how concepts apply to professional work
- Teach others about a topic
- Reflect on the content[76]

Within an individual course, an instructor has multiple opportunities to integrate active learning strategies for the benefit of the class. To increase teaching effectiveness and student responsiveness, a variety of instructional technology tools and techniques can be implemented to achieve the desired outcome.

CONCLUSION

Given the explosive growth of online learning over the last two decades, it is tempting to wonder what the next decade will bring as countless

71. *See id.*

72. *See Features*, PADLET (last visited Aug. 24, 2019), https://padlet.com/features; POPPLET, http://popplet.com/ (last visited Aug. 24, 2019).

73. *See About*, DIIGO (last visited Aug. 24, 2019), https://www.diigo.com/about; *Web Clipper Features*, EVERNOTE (last visited Sept. 3, 2019), https://evernote.com/features/webclipper.

74. *See Features*, ADOBE SPARK (last visited Aug. 24, 2019), https://spark.adobe.com/features; *see also Features*, CANVA (last visited Aug. 24, 2019), https://www.canva.com/features/.

75. *See* FLIPGRID, https://info.flipgrid.com/ (last visited Aug. 24, 2019).

76. *See* Patrick R. Lowenthal & Joanna C. Dunlap, *From Pixel on a Screen to Real Person in Your Students' Lives: Establishing Social Presence Using Digital Storytelling*, 13 INTERNET & HIGHER EDUC. 70, 70–71 (2010).

new technologies continue to be developed. One might even imagine a time when online learning will be considered the "traditional form of learning."[77] But for now we must acknowledge two interconnected truths—first, that online learning will continue to play an increasingly important role in education and the lives of our students,[78] and second, that as a result, it is our responsibility as educators to create the most effective and compelling online instruction we can for the benefit of those students. To this end, professors can rely on decades of educational psychology research to ensure that the well-established best practices for instruction transfer to the online classroom. There is no need to sacrifice standards for access or rigor for convenience. By embracing the core principles of effective instruction, and translating them to the technology of the moment, we can deliver for all of our students—and be ready for whatever new development is right around the corner.

77. *See* Huay Lit Woo, *The Design of Online Learning Environments from the Perspective of Interaction,* 53 EDUC. TECH. 34, 35 (2013).

78. *See* SEAMAN, ALLEN & SEAMAN, *supra* note 1, at 14–17.

APPENDIX

Free & Low-Cost Technology Tools for Enhancing Student Engagement in Online Courses

Image Editing
Canva
GIMP
TechSmith Jing
TechSmith SnagIt
Thinglink (interactive images)

Video Creation & Screencasting
TechSmith Camtasia
Adobe Spark
Microsoft Sway
Animoto
Apple iMovie
TechSmith Jing
Screencast-o-matic
edPuzzle (create interactive lessons from any video)

Brainstorming Tools
Padlet
Popplet
LucidChart
MindMeister
Coggle

Discussion Tools
Flipgrid (video discussion responses)
VoiceThread (audio or video conversations surrounding a piece of media)

Stock Images and Audio
Creative Commons
Pixabay
Unsplash
FreeSound

Animated Character Videos
Powtoon
Plotagon
Voki

Content Curation
Diigo
Evernote
Symbaloo
Pearltrees
Pinterest
Feedly

Audio Editing
Apple GarageBand
Audacity
TechSmith Camtasia