

DEVELOPING ONLINE COURSES TO EXPAND UNDERGRADUATE RESEARCH ACROSS CAMPUS

ConnectUR 2022 Conference

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Office of Undergraduate Research

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Key Takeaways

- Describe the components of developing an online class that includes research practices
- Assess educational technologies available at their own institution or online that could support their online courses
- Articulate the value of converting traditional, in-person presentations to an online environment

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Two Different Scenarios in Developing Online Courses

No in-person course is offered

- Preparing for Your Undergraduate Research Experience
- Understanding Your Undergraduate Research Experience I
- Understanding Your Undergraduate Research Experience II
- Beyond Undergraduate Research (graduate/professional school prep)

An in-person course is offered

- Research Peer Mentoring Training (supported by CIMER's *Entering Mentoring* curriculum)

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Theoretical Frameworks Guiding Online Course Development

- Backward design (Wiggins and McTighe, 2005)
- Self-determination theory (Deci and Ryan, 1985, 2000)
- Universal course design (Rose and Meyer, 2002)

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Backward Design (Wiggins and McTighe, 2005)



**Identify
desired outcomes**



**Determine
acceptable
evidence of
learning**



**Plan learning
experiences and
instruction**

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Self-Determination Theory (Deci and Ryan, 1985, 2000)

Self-determination theory (Deci and Ryan, 1985, 2000)

- Relatedness
 - Connections with people (instructors, students) and materials
- Competence
 - Content mastery; Scaffolding from easy to more complex activities.
- Autonomy
 - Feelings of volition and choice; endorsement of behavior, ownership of the learning process

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Universal Course Design (Rose and Meyer, 2002)

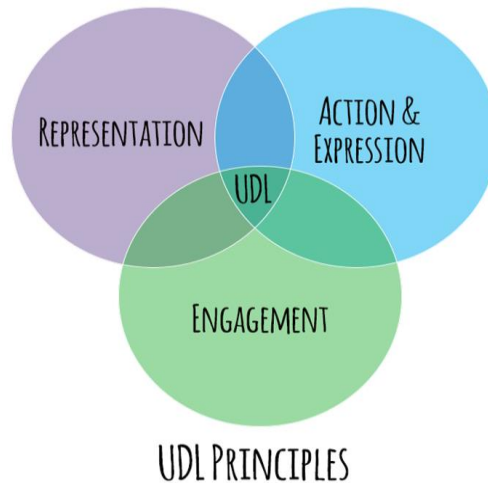


Image from:
<https://csaedu.com/communications/universal-design-for-learning/>

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Considerations Creating Online Courses

- Same course, but all colleges/discipline taking it
- Consider a campus-wide (breadth) and a programmatic (depth) approach to the content
- Address college-specific and discipline-specific items to ensure experts are adding to the general content provided
- Ensure multiple research areas feel validated and supported, especially on our STEM-focused campus
- Create a community of undergraduate researchers
- Modular and asynchronous for a full semester (~15 weeks) or a short semester (~7 weeks)

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Considerations for Available Tools

- Discussion boards
 - Build an online community and foster relationships between students to instructor and student to student.
 - Prompts to provide original contribution and to respond to others' posts
- Quizzes
 - Short self-inventory (quiz) for students to check their understanding of a module's goals
 - Fostered relatedness and competency
- Journals
 - Personal reflections between the instructors and the student that are deeper prompts
 - Helped fostering relatedness

Quizzes, journals, and discussion board posts allowed students to engage through multiple means of expression, representation and engagement

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Considerations for Available Tools

- Third-party applications (e.g., Piazza)
- Rubrics
 - Students can self-assess their own work to meet learning outcomes
 - Fostered competency
- Kaltura/Media management
 - Used concise, short videos to optimize student Cognitive load and attention span.
 - Recreated instructor's natural persona in an online environment
 - Fostered autonomy by letting the students watch at their own pace and time, every week.
- Learning Management System (LMS) transferability
 - Modular and portable format

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Course Changes

Lessons learned...

- Peer interview paper was removed
 - Based on feedback and going back to our goals, we achieved the goal this connected to through discussions and peer-review feedback
- Rubrics have been made much more substantial
- Examples are provided for some activities
- Discussions vs. Journals – not every module will have both

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Course Content

- Research-supported and campus advisory panel approved
 - Especially considering what is needed and how much time it should take
- Include career competencies (NACE) in each course to connect to broader growth themes
- Recorded content is “evergreen” with text, articles, short videos for content that changes
 - Campus experts and guest speakers should consider this when creating content
- Each module has learning objectives
 - 1-2 videos per modular learning objective each no more than 15 minutes

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Additional Items from Our Courses

- Extra credit is provided to students who watch and provide feedback to at least 5 posters or research talks during that semester's undergraduate research symposium – and this is stated at the beginning
- Iterative process for larger assignments with rubrics the same for both
 - For example, poster presentation assignment includes a poster layout, poster draft, presentation draft recording, final poster, and a final poster presentation.
 - For example, the peer mentorship philosophy statement includes a statement draft and a final statement.
- Remind students how they can "subscribe" to threads in discussions

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Course Assessment

- Check out our 3-minute flash talk on the course-wide assessment strategies we implemented for our courses on the ConnectUR 2022 website



This QR code will take you to a website with information from multiple ConnectUR presentations by staff in the Purdue University Office of Undergraduate Research.

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THANK YOU



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