

## Centering Student Learning

### Summary of the Literature

Student-centered learning is transparent and intentional in its design. Learning goals and evaluation criteria are explicit and aligned with structured learning activities that balance instructor support with student autonomy. Students actively explore concepts and practices from diverse perspectives using collaborative, experiential, and problem-based learning approaches, in which students are given opportunities to direct their own learning. A student-centered curriculum recognizes the student as a whole person whose emotions, identities, learning style, and previous experiences influence their learning. Effectively teaching the whole student means creating a supportive learning environment that addresses structural inequities, provides equitable access to learning, and ultimately fosters a sense of belonging in the classroom.

Successfully supporting student learning requires ongoing pedagogical and professional growth and development by faculty and staff. The benefits of these efforts are many. Student-centered curricula and learning environments improve learning outcomes and performance, especially for minoritized students, and enhance students' confidence, intrinsic motivation, and responsibility toward their learning. In other words, centering student learning is critical to developing students as effective life-long learners.

### Annotated Bibliography

#### **Belonging, Success, Access, and Disruption: Physics Faculty Goals for Inclusive Learning Environments**

Robertson, Amy D., W. Tali Hairston, Rachel E. Scherr. 2017. Belonging, Success, Access, and Disruption: Physics Faculty Goals for Inclusive Learning Environments. *FEMS Microbiology Letters* 364. DOI: 10.1093/femsle/fnx179

#### **Keywords**

- Inclusive teaching
- Physics education
- Faculty development
- Systemic oppression
- Student success
- Marginalization

#### **Summary**

The article "Belonging, Success, Access, and Disruption: Physics Faculty Goals for Inclusive Learning Environments" explores various goals of physics faculty in creating inclusive learning environments. Based on interviews with 18 faculty members, the study identifies four primary goals: ensuring all students feel welcome, facilitating student success, providing access to physics culture, and disrupting systemic oppression in the classroom. These goals reflect different understandings of inclusion, ranging from interpersonal actions that foster a

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welcoming environment to systemic changes that address structural inequities. The study emphasizes the importance of aligning faculty development with these diverse goals to promote meaningful and sustainable inclusion in physics education.

### Practical Actions Recommended

- 1. Creating a Welcoming Environment**
  - **Example:** Use inclusive language and ensure correct pronunciation of students' names.
  - **Action:** Adopt gender-neutral phrases such as "you all" instead of "you guys" and learn to pronounce all students' names correctly.
- 2. Supporting Student Success**
  - **Example:** Develop mentoring programs and provide personalized support.
  - **Action:** Implement structured mentoring programs where senior students guide junior students and offer advice on course selection and research advisor fit.
- 3. Providing Access to Physics Culture**
  - **Example:** Use shared experiences in teaching to bridge social capital gaps.
  - **Action:** Incorporate hands-on lab experiences and collaborative activities that do not assume prior knowledge or shared experiences outside the classroom.
- 4. Disrupting Systems of Oppression**
  - **Example:** Address microaggressions and promote equity in classroom interactions.
  - **Action:** Call out and address sexist or racist comments and behaviors in the classroom to create a safer and more inclusive environment.
- 5. Transforming Physical and Social Environments**
  - **Example:** Make study spaces more accessible and inviting to all students.
  - **Action:** Redesign physical study environments to be transparent and open, ensuring all students feel they belong and can access these resources.
- 6. Encouraging Collaborative Learning**
  - **Example:** Shift from competitive to collaborative consensus-building in classroom discussions.
  - **Action:** Emphasize collaborative sense-making and community-building in classroom activities rather than competitive argumentation.
- 7. Promoting Intercultural Knowledge**
  - **Example:** Use diverse examples and discussions in physics content.
  - **Action:** Include multicultural examples in teaching materials and engage students in discussions about who is represented in STEM fields and whose voices are heard in classroom interactions.

## A Student-Centered Approach to Teaching: A Study of the Use of Workshops and the Reflective Journal

Laing, C. Linda. "A Student-Centered Approach to Teaching: A Study of the Use of Workshops and the Reflective Journal." *e-Journal of Business Education and Scholarship of Teaching* 17.1 (2023): 15-26.

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## Keywords

- Student-Centered Learning
- Experiential Learning
- Workshops
- Reflective Journal

## Summary

The article by C. Linda Laing explores the impact of student-centered learning approaches, specifically workshops and reflective journals, on undergraduate students in a Human Resource Management course. The study utilized questionnaires to gather feedback from students, revealing initial resistance to non-traditional teaching methods and a preference for structured learning environments. Over time, students began to appreciate the value of experiential learning and reflective practices, developing increased self-awareness and problem-solving skills. The findings suggest that while there is initial discomfort with student-centered approaches, these methods ultimately foster deeper learning and personal growth.

## Practical Actions Recommended

- 1. Implement Workshops:**
  - **Action:** Use workshops to create an interactive, student-centered learning environment.
  - **Example:** Incorporate role plays and group discussions to apply theoretical knowledge to practical situations.
- 2. Use Reflective Journals:**
  - **Action:** Encourage students to maintain reflective journals to document their learning experiences and personal growth.
  - **Example:** Assign regular journal entries where students reflect on their class activities and feedback.
- 3. Provide Clear Structure and Guidance:**
  - **Action:** Gradually introduce student-centered methods while providing clear instructions and support.
  - **Example:** Offer detailed guidelines and examples for reflective writing to help students adjust to new learning approaches.
- 4. Facilitate Debriefing Sessions:**
  - **Action:** Conduct debriefing sessions to help students process their experiences and understand the value of reflective practices.
  - **Example:** After workshops, hold discussions where students share their reflections and learn from each other's experiences.
- 5. Create a Supportive Learning Environment:**
  - **Action:** Establish a classroom climate that encourages trust, acceptance, and mutual respect.
  - **Example:** Use activities that build community and ensure that all students feel safe to express their thoughts and feelings.
- 6. Address Emotional Responses:**

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- **Action:** Acknowledge and work with students' emotional reactions to new learning methods.
- **Example:** Discuss the emotional aspects of learning and provide strategies to manage discomfort and anxiety.

## Inclusive and Active Pedagogies Reduce Academic Outcome Gaps and Improve Long-Term Performance

Dewsbury, Bryan M., Holly J. Swanson, Serena Moseman-Valtierra, Joshua Caulkins. 2022. Inclusive and Active Pedagogies Reduce Academic Outcome Gaps and Improve Long-Term Performance. PLOS ONE 17(6). DOI: 10.1371/journal.pone.0268620

### Keywords

- Inclusive teaching
- Active learning
- STEM Education
- Academic performance
- Ethnic performance gap
- Long-term academic success

### Summary

The study investigates the impact of inclusive and active pedagogical approaches on student performance in an introductory biology course at a large public research university. Over five years, the researchers compared academic outcomes between students taught with active and inclusive methods and those taught with traditional didactic approaches. The study found that inclusive teaching in the first semester improved overall grades, particularly for historically underrepresented students, while active learning in the second semester reduced ethnic performance gaps. Students exposed to these learning-centered pedagogies performed better in subsequent 200-level biology courses. The results suggest that active and inclusive pedagogies can significantly enhance academic performance and long-term success, highlighting the need for institutional support for these teaching methods.

### Practical Actions Recommended

- 1. Implementing Inclusive Pedagogies**
  - **Example:** Use reflective assignments to understand students' backgrounds and beliefs.
  - **Action:** Incorporate "I believe" reflection essays at the start of the course to build a dialogic relationship with students and tailor teaching strategies accordingly.
- 2. Active Learning Strategies**
  - **Example:** Employ small-group problem-solving activities during lectures.
  - **Action:** Design class sessions that include interrupted lectures with integrated formative assessments and group work to ensure active student participation.
- 3. Reducing High-Stakes Assessments**

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- **Example:** Use multiple, low-stakes assessments throughout the semester.
  - **Action:** Implement a variety of assessment methods such as quizzes, group projects, and pre-class assignments, and reduce the weight of summative exams to lower pressure and provide ongoing feedback.
4. **Creating a Supportive Learning Environment**
- **Example:** Develop a classroom climate that values all student contributions.
  - **Action:** Establish classroom norms that encourage respect, inclusivity, and the recognition of diverse perspectives, ensuring all students feel valued and heard.
5. **Professional Development for Faculty**
- **Example:** Train instructors in inclusive and active teaching practices.
  - **Action:** Offer workshops and training sessions on evidence-based inclusive teaching methods, such as Deep Teaching, and active learning techniques.
6. **Continuous Monitoring and Adaptation**
- **Example:** Regularly collect and analyze student feedback to improve teaching practices.
  - **Action:** Use student evaluations, peer observations, and self-reflection to continuously adapt and enhance teaching strategies, ensuring they meet the diverse needs of students.

## Philosophy versus Approach in the Student-Centered Classroom: The 5E Learning Cycle

Fujiwara, Yujiro, and Kathryn Lewis. "Philosophy versus Approach in the Student-Centered Classroom: The 5E Learning Cycle." *Childhood Education* 99.6 (2023): 66-71.

### Keywords

- 5E Learning Cycle
- Student-Centered Learning
- Constructivist Theories
- Active Learning
- Educational Strategies
- Teacher-Led Instruction
- Inquiry-Based Learning

### Summary

The article by Yujiro Fujiwara and Kathryn Lewis discusses the distinction between philosophy and approach in student-centered classrooms, focusing on the 5E Learning Cycle. This framework, which includes Engagement, Exploration, Explanation, Elaboration, and Evaluation, is rooted in constructivist theories that emphasize student agency and active learning. The authors argue that a successful student-centered classroom balances teacher guidance with student autonomy. They highlight that while student-centered learning fosters intrinsic motivation and deeper understanding, teacher-led instruction still plays a critical role in providing structure and addressing specific curricular needs. The 5E Learning Cycle offers a practical method for integrating these elements to create an effective and dynamic learning environment.

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## Practical Actions Recommended

- 1. Engagement (Teacher/Explicitly Subject-Centered):**
  - **Action:** Pose a question or assign a task that sparks curiosity.
  - **Example:** Teachers can ask open-ended questions to gauge students' prior knowledge and encourage them to form hypotheses.
- 2. Exploration (Student-Led):**
  - **Action:** Allow students to build skills and discover concepts through inquiry.
  - **Example:** Students conduct experiments or research projects to explore and understand new ideas.
- 3. Explanation (Teacher/Explicitly Subject-Centered):**
  - **Action:** Provide direct instruction to clarify concepts and correct misconceptions.
  - **Example:** Mini-lessons or targeted teaching sessions to solidify students' understanding.
- 4. Elaboration (Teacher/Student-Led):**
  - **Action:** Challenge students to extend their knowledge through new activities.
  - **Example:** Group projects or individual assignments that require applying learned concepts to different contexts.
- 5. Evaluation (Student/Explicitly Subject-Centered):**
  - **Action:** Encourage students to reflect on their learning and assess their understanding.
  - **Example:** Reflective journals, peer reviews, or self-assessment activities to evaluate progress and identify areas for improvement.

## The Effects of Student-Centered Learning on First-Year College Students' Perceptions of and Investment in English Learning

Park, Hyona. "The Effects of Student-Centered Learning on First-Year College Students' Perceptions of and Investment in English Learning." *English Teaching* 78.3 (2023): 55-84.

### Keywords

- Student-Centered Learning
- Reading Assignments
- Construction of Investment
- Identity

### Summary

The study by Hyona Park investigates the impact of student-centered learning on first-year college students' perceptions of and investment in English learning. Using thematic analysis of open-ended surveys and interviews, the research found that initially, students recognized the importance of learning English but had ambivalent attitudes towards it. After completing student-centered reading assignments, students expressed increased self-confidence, a sense of accomplishment, and a willingness to learn, which helped them concretely construct their investment in English learning. The study highlights the positive impact of

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student-centered learning, particularly as an alternative to exam-driven instructional approaches prevalent in Korea.

### Practical Actions Recommended

1. **Implement Student-Centered Reading Assignments:**
  - **Action:** Assign students to choose paragraphs from reading passages and create teaching videos.
  - **Example:** Students explain vocabulary, grammar, and sentence structures as if they were teachers.
2. **Promote Active Participation:**
  - **Action:** Encourage students to actively engage in their learning process.
  - **Example:** Allow students to use technological tools to create educational content, fostering creativity and autonomy.
3. **Facilitate Self-Directed Learning:**
  - **Action:** Design assignments that require students to take responsibility for their own learning.
  - **Example:** Have students thoroughly study the material and plan ways to convey knowledge effectively in their videos.
4. **Foster a Sense of Accomplishment:**
  - **Action:** Provide opportunities for students to experience success in their learning.
  - **Example:** After completing assignments, students reported feeling more confident and motivated to continue learning.
5. **Encourage Reflection on Learning:**
  - **Action:** Include reflective components in assignments to help students assess their progress.
  - **Example:** Use surveys and interviews to gather student feedback on their learning experiences and perceptions of English.
6. **Support the Construction of Investment:**
  - **Action:** Design activities that help students build a concrete commitment to learning.
  - **Example:** Create assignments that show the practical benefits of English proficiency, thereby encouraging students to invest in their learning.

### Preparing an Effective Syllabus: Current Best Practices

Slattery, Jeanne M., and Janet F. Carlson. "Preparing an effective syllabus: Current best practices." *College Teaching* 53.4 (2005): 159-164.

### Keywords

- Syllabus Design
- Student Engagement
- Course Planning
- Higher Education
- Instructional Strategies

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## Summary

The article by Jeanne M. Slattery and Janet F. Carlson reviews best practices in syllabus design, highlighting its critical role in structuring, motivating, and evidencing the teaching and learning process. Syllabi serve as a contract between faculty and students, outline course objectives and assignments, and set the tone for the course. The authors emphasize the importance of creating a detailed, inclusive, and flexible syllabus that motivates students, aligns with course goals, and provides clear expectations. By incorporating components such as contact information, course description, goals, assignments, grading criteria, and schedules, a well-designed syllabus can enhance student engagement and success.

## Practical Actions Recommended

1. **Set a Positive Tone:**
  - Action: Use a warm and friendly tone in the syllabus to motivate and encourage students.
  - Example: Start the syllabus with an introduction that welcomes students and expresses enthusiasm for the course.
2. **Include Detailed Course Information:**
  - Action: Provide comprehensive information about the course, including contact details, office hours, and course descriptions.
  - Example: Clearly outline the course objectives, prerequisites, and any required materials or textbooks.
3. **Outline Clear Course Goals and Objectives:**
  - Action: Define specific, measurable goals that students should achieve by the end of the course.
  - Example: Use action verbs like "evaluate," "analyze," and "create" to describe the desired learning outcomes.
4. **Describe Assignments and Grading Criteria:**
  - Action: Detail all assignments, their due dates, and the criteria for grading.
  - Example: Provide rubrics for major assignments to clarify how students will be assessed.
5. **Create a Flexible but Structured Schedule:**
  - Action: Develop a course schedule that includes important dates for exams, assignments, and readings.
  - Example: Include flexibility in the schedule to accommodate unforeseen events or student needs.
6. **Incorporate Motivational Messages:**
  - Action: Include positive statements that encourage students to take ownership of their learning.
  - Example: Explain the rationale behind assignments to help students understand their purpose and relevance.
7. **Promote Accessibility and Inclusivity:**
  - Action: Ensure the syllabus is accessible to all students and consider the needs of underrepresented groups.
  - Example: Provide information on university support services, such as tutoring centers, counseling services, and disability accommodations.



# Measuring the Promise: A Valid and Reliable Syllabus Rubric Guide to Assessing the Focus of Syllabi

Palmer, Michael, Dorothe Bach, Adriana Streifer. (2014). Measuring the Promise: A Valid and Reliable Syllabus Rubric Guide to Assessing the Focus of Syllabi. *To Improve the Academy: A Journal of Educational Development* 33(1): 14-36.

### Keywords

- Syllabus design
- Learning-centered teaching
- Educational assessment
- Higher education
- Course design

### Summary

Palmer, Bach, and Streifer provide a comprehensive rubric designed to assess the degree to which course syllabi are learning-centered. The rubric evaluates syllabi based on four key criteria: learning goals and objectives, assessment activities, course schedule, and overall learning environment. These criteria are further broken down into components that reflect essential, important, and less-important elements of a learning-centered syllabus. The rubric aims to ensure syllabi promote significant learning experiences by addressing cognitive, affective, and self-directed learning domains. The article emphasizes the importance of alignment between learning objectives, assessment activities, and course content, advocating for a holistic approach to syllabus design that supports student engagement and success.

### Practical Actions Recommended

- 1. Articulate Clear Learning Goals and Objectives:**
  - Ensure learning goals encompass a range of dimensions, including cognitive, affective, and self-directed learning.
  - Use specific action verbs to describe measurable learning objectives, avoiding vague terms like "understand" or "know."
- 2. Align Assessments with Learning Objectives:**
  - Design major assessment activities that map directly onto the course's learning objectives.
  - Provide detailed descriptions of assessment tasks, including rationales and criteria for evaluation.
- 3. Implement Formative Assessments:**
  - Incorporate frequent low-stakes assessments with immediate feedback to allow students to practice and improve before high-stakes evaluations.
  - Utilize diverse feedback sources, such as self-assessment, peer review, and instructor comments.
- 4. Create a Comprehensive Course Schedule:**

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- Develop a logically sequenced schedule that includes topics, readings, questions, and assignment due dates.
  - Allow for flexibility within the schedule to accommodate the dynamic nature of the learning process.
- 5. Foster a Positive Learning Environment:**
- Use a respectful and inviting tone throughout the syllabus, addressing students as competent, engaged learners.
  - Communicate the potential value of the course in students' personal, academic, and professional lives.
- 6. Promote Student Motivation and Engagement:**
- Clearly describe how course content connects to significant questions and real-world applications.
  - Provide opportunities for students to take ownership of their learning through choices in project topics, reading assignments, and grading schemes.
- 7. Communicate High Expectations and Support:**
- Set high academic standards and project confidence in students' ability to meet them through hard work.
  - Offer resources and strategies to help students succeed, such as office hours, review sessions, and additional materials.

By implementing these practices, educators can design syllabi that are not only instructional documents but also tools that enhance student learning, engagement, and success, aligning with principles of transparent and intentional design, fostering belonging, and promoting equitable access to education.

## The First Line of Contact: How Course Syllabi Can Be Used to Gauge & Reform Learner-Centeredness in a College Classroom

Heim, Ashley B., Emily R. Aldor, Emily A. Holt. 2019. The First Line of Contact: How Course Syllabi Can Be Used to Gauge & Reform Learner-Centeredness in a College Classroom. *The American Biology Teacher* 81(6): 403-409.

### Keywords

- Learner-centeredness
- Course syllabus
- Teaching practices
- Biology education
- Postsecondary education
- Syllabus rubric

### Summary

The article by Heim et al. investigates the effectiveness of using course syllabi to measure and promote learner-centeredness in introductory biology classrooms. The study utilized Palmer et al.'s (2014) syllabus scoring rubric to evaluate the learner-centeredness of syllabi

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from eight instructors teaching a nonmajors biology course. The research aimed to determine if syllabus scores aligned with faculty self-reports and expert observations of classroom practices, and whether these metrics could predict an instructor's syllabus score better than demographic factors such as gender or teaching experience. The findings revealed that syllabus scores correlated well with expert observations but less so with faculty self-reports. Instructors' syllabi that incorporated clear learning objectives, assessment activities, and a supportive learning environment tended to be more learner-centered. The study underscores the importance of integrating learner-centered practices into course syllabi to enhance teaching effectiveness and student engagement.

### Practical Actions Recommended

- 1. Develop Clear Learning Objectives:**
  - Frame learning objectives around what students should be able to do after instruction, focusing on both cognitive and affective domains.
  - Use diverse verbs from Fink's taxonomic model to cover a range of learning outcomes.
- 2. Incorporate Learner-Centered Assessment Activities:**
  - Design assessment activities that actively engage students and promote critical thinking.
  - Provide a variety of assessment methods to cater to different learning styles and preferences.
- 3. Create a Supportive Learning Environment:**
  - Use inclusive language and an inviting tone in the syllabus to establish a positive classroom climate.
  - Include statements that encourage student-faculty interactions and outline support resources.
- 4. Align Syllabus Content with Classroom Practices:**
  - Ensure that the syllabus reflects the actual teaching practices and classroom environment.
  - Periodically review and update the syllabus to maintain consistency with learner-centered teaching goals.
- 5. Engage in Reflective Practice:**
  - Reflect on how well teaching practices align with the intended learning environment as described in the syllabus.
  - Collect and incorporate feedback from students to continuously improve the syllabus and teaching methods.
- 6. Promote Student Choice and Autonomy:**
  - Provide opportunities for students to make choices about their learning activities and assessments.
  - Encourage student input in the design and execution of the course to foster a sense of ownership and engagement.
- 7. Utilize Syllabus as a Communication Tool:**
  - Use the syllabus as a primary means of communicating high expectations and the value of the course to students.
  - Highlight the instructor's commitment to student success and learning through clear, supportive messaging.

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By implementing these practices, instructors can create more learner-centered syllabi that enhance student engagement, promote effective teaching, and align with the principles of centering student learning, fostering belonging, and promoting equitable access to education.

## Supporting Diverse Learning Styles: A Case Study in Student-Led Syllabus Design

Harding, Lauren Howard. "Supporting Diverse Learning Styles: A Case Study in Student Led Syllabus Design." *Journal of Political Science Education* 19.1 (2023): 83-90.

### Keywords

- Syllabus Design
- Negotiated Syllabus
- Student Led
- Learning Styles
- Active Learning

### Summary

The article presents a case study on student-led syllabus design implemented in an Honors American Government course. This approach aimed to accommodate diverse learning styles and increase student engagement. Students were surveyed on their preferred learning methods, assignment types, accountability mechanisms, and levels of active learning. The resultant syllabus incorporated both passive and active learning activities such as lectures, readings, debates, simulations, and group discussions. Student feedback indicated high satisfaction with the course, demonstrating enhanced motivation and engagement due to their involvement in the syllabus design process. The study concludes that student-led syllabus design can effectively address diverse learning preferences and promote a more engaging and inclusive learning environment.

### Practical Actions Recommended

- 1. Conduct Surveys to Determine Learning Preferences:**
  - Use surveys to gather information on students' preferred learning methods, assignment types, and accountability mechanisms.
  - Example: On the first day of class, distribute a survey asking students to rank their preferences for lectures, readings, group discussions, debates, and simulations.
- 2. Incorporate a Mix of Learning Activities:**
  - Design a syllabus that balances traditional and active learning methods to cater to different learning styles.
  - Example: Include lectures and readings for those who prefer reflective learning and simulations and debates for those who prefer active learning.
- 3. Adapt Assignments to Accommodate Diverse Learning Styles:**

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- Modify assignments to ensure all students can engage in a manner that suits their learning preferences.
- Example: For a debate assignment, allow some students to participate actively while others contribute through research and analysis.
- 4. **Promote Student Ownership and Responsibility:**
  - Involve students in the decision-making process to enhance their sense of ownership and responsibility for their learning.
  - Example: Allow students to select topics for current events discussions and choose their roles in group projects.
- 5. **Foster Continuous Feedback and Adaptation:**
  - Create an environment where students feel comfortable providing feedback and suggest adjustments throughout the course.
  - Example: Regularly ask for student input on the effectiveness of different activities and make necessary adjustments based on their feedback.
- 6. **Balance Student Choices with Essential Content:**
  - Ensure that while students have input in the syllabus design, the core content and skills necessary for the course are not compromised.
  - Example: Maintain essential topics and skills in the syllabus while allowing flexibility in the methods used to teach these elements.
- 7. **Evaluate and Reflect on the Approach:**
  - Assess the impact of student-led syllabus design on learning outcomes and student satisfaction to refine the approach for future courses.
  - Example: Use pre-test and post-test evaluations to measure learning gains and gather detailed student feedback on the syllabus design process.

## Empowering College Students: UDL, Culturally Responsive Pedagogy, and Mindset as an Instructional Approach

Gentile, Amber L., and Mary Budzilowicz. "Empowering college students: UDL, culturally responsive pedagogy, and mindset as an instructional approach." *New Directions for Teaching and Learning* 2022.172 (2022): 33-42.

### Keywords

- Universal Design for Learning (UDL)
- Culturally Responsive Pedagogy (CRP)
- Growth Mindset
- Social Emotional Learning (SEL)
- Trauma Informed Practices (TIP)
- Inclusive Education

### Summary

The article explores the integration of Universal Design for Learning (UDL), Culturally Responsive Pedagogy (CRP), and Growth Mindset into a cohesive instructional approach aimed at addressing the diverse and holistic needs of college students. Emphasizing the importance of social-emotional learning (SEL) and trauma-informed practices (TIP), the

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authors present a model that supports student engagement, equity, and expert learning. This approach, grounded in research by Dweck, Hammond, and others, is designed to create an inclusive educational environment that values diversity and promotes student success through intentional and flexible instructional design. The authors provide practical strategies for implementing these principles within learning management systems to enhance student achievement.

### Practical Actions Recommended

1. **Universal Design for Learning (UDL) Principles:**
  - Design curriculum that offers multiple means of engagement, representation, and expression to accommodate diverse learning needs.
  - Example: Use various formats for course materials (videos, podcasts, readings) and provide options for students to demonstrate their understanding (written assignments, presentations, creative projects).
2. **Culturally Responsive Pedagogy (CRP):**
  - Incorporate students' cultural backgrounds and experiences into the learning process to make it more relevant and engaging.
  - Example: Include diverse texts and perspectives in the curriculum and use culturally relevant teaching strategies such as storytelling and collaborative learning.
3. **Growth Mindset:**
  - Encourage a growth mindset by promoting the idea that abilities can be developed through effort and perseverance.
  - Example: Provide constructive feedback focused on students' efforts and strategies rather than their innate abilities, and create opportunities for students to reflect on their learning processes.
4. **Social Emotional Learning (SEL):**
  - Integrate SEL strategies to support students' emotional and social well-being, which are critical for effective learning.
  - Example: Start classes with check-ins to understand students' emotional states, use activities that build empathy and cooperation, and create a classroom environment that values each student's voice.
5. **Trauma Informed Practices (TIP):**
  - Implement TIP to create a safe and supportive learning environment for students who may have experienced trauma.
  - Example: Use a compassionate approach in interactions with students, provide clear and consistent expectations, and offer choices to empower students and reduce anxiety.
6. **Inclusive and Supportive Classroom Environment:**
  - Establish a classroom culture that fosters belonging and respects diversity.
  - Example: Greet students by name, use inclusive language, and create opportunities for all students to contribute and feel valued.
7. **Flexible Course Design:**
  - Design courses that are flexible and adaptable to meet the varying needs of students.
  - Example: Offer flexible deadlines and multiple ways for students to engage with the course content and demonstrate their learning.

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### 8. Use of Learning Management Systems:

- Leverage technology to support diverse learning needs and promote engagement.
- Example: Use tools like discussion boards, interactive quizzes, and multimedia resources to create an interactive and accessible online learning environment.

## The College Science Learning Cycle: An Instructional Model for Reformed Teaching

Withers, M. (2016). The College Science Learning Cycle: An Instructional Model for Reformed Teaching. *CBE—Life Sciences Education*, 15(es12), 1-12.  
doi:10.1187/cbe.15-04-0101

### Keywords

- College Science Learning Cycle (CSLC)
- active learning
- student-centered teaching
- backward design, science education
- instructional design
- Engagement
- evaluation

### Summary

The article by Michelle Withers introduces the College Science Learning Cycle (CSLC), an instructional model designed to help college science faculty adopt student-centered, active-learning approaches. Adapted from the Biological Sciences Curriculum Study (BSCS) 5E model, the CSLC consists of three stages: engage, construct, and evaluate. This model is embedded within the framework of backward design, emphasizing the alignment of learning outcomes, assessments, and instructional activities. The CSLC aims to make the transition from traditional lectures to active learning more manageable for instructors by providing a structured approach to developing effective teaching materials. The article includes practical examples and resources to support faculty in implementing these strategies, ultimately aiming to enhance student engagement and learning outcomes in college science courses.

### Practical Actions Recommended

#### 1. Engage Stage:

- **Pique Student Interest:** Use relevant topics or hooks to capture student interest and relate content to real-world issues.
  - Example: Introduce a genetic disease like phenylketonuria (PKU) to engage students in learning about gene expression.
- **Gauge Prior Knowledge:** Assess students' preconceptions and prior knowledge to tailor instruction effectively.

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- Example: Use pre-class quizzes or brainstorming sessions to identify students' understanding and misconceptions.

### 2. Construct Stage:

- **Deliberate Practice:** Design activities that promote the practice of scientific skills and concepts, aligning with desired learning outcomes.
  - Example: Use clicker questions and group activities to help students understand the relationship between DNA sequences and protein synthesis.
- **Scaffold Learning:** Break down complex concepts into manageable parts and provide clear instructions for each step.
  - Example: Guide students through the steps of identifying the reading frame and coding strand in gene sequences.

### 3. Evaluate Stage:

- **Formative Assessments:** Incorporate assessments that provide timely feedback to both students and instructors on progress towards learning goals.
  - Example: Assign homework that requires students to analyze mutations in the PKU gene and predict their effects on protein function.
- **Synthesis Activities:** Use activities that require students to integrate and apply their knowledge in new contexts.
  - Example: Have students create examples of natural selection scenarios and evaluate their understanding of the concept.

### 4. Backward Design:

- **Learning Outcomes:** Start with specific, assessable learning outcomes that guide the development of assessments and learning activities.
  - Example: Define outcomes such as "students will be able to predict changes in amino acid sequences caused by mutations."
- **Align Activities:** Ensure that instructional activities and assessments are directly aligned with the learning outcomes.
  - Example: Design class activities that mirror the types of questions students will encounter on assessments.

### 5. Use of Resources:

- **Existing Materials:** Adapt and repurpose existing course materials to fit the CSLC framework, rather than starting from scratch.
  - Example: Use a decision tree to evaluate and modify lecture content for active learning.
- **Collaborative Tools:** Leverage available resources and collaborate with peers to share materials and strategies.
  - Example: Utilize online platforms like CourseSource for accessing reformed teaching materials



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# Measuring Actual Learning versus Feeling of Learning in Response to Being Actively Engaged in the Classroom

Deslauriers, Louis, Logan S. McCarty, Kelly Miller, Kristina Callaghan, Greg Kestin. 2019. Measuring Actual Learning versus Feeling of Learning in Response to Being Actively Engaged in the Classroom. *Proceedings of the National Academy of Sciences* 116(39): 19251-19257.

### Keywords

- Active learning
- Passive learning
- Student engagement
- Cognitive effort
- Learning perception
- STEM education

### Summary

The study conducted by Deslauriers et al. investigates the discrepancy between students' perceived learning and actual learning in active versus passive learning environments. Using a controlled experiment with large-enrollment introductory physics courses at Harvard University, the researchers compared students' self-reported feelings of learning (FOL) with their actual performance on tests of learning (TOL). Students in the active learning group, who engaged in problem-solving and group activities, learned more but reported lower FOL compared to their peers in the passive lecture group. The findings highlight that students often misinterpret the cognitive effort required in active learning as a lack of learning, which can lead to a preference for traditional lectures. The study emphasizes the need for instructors to address these perceptions early in the semester to enhance student acceptance and the effectiveness of active learning strategies.

### Practical Actions Recommended

- 1. Introduce Active Learning Early:**
  - Begin the semester with a clear explanation of the benefits of active learning, including evidence of its effectiveness.
  - Present the concept that increased cognitive effort is a positive indicator of deep learning, not a sign of poor understanding.
- 2. Provide Early Assessments:**
  - Administer quizzes or other assessments early in the semester to help students gauge their actual learning and see the benefits of active engagement.
- 3. Facilitate and Explain Active Learning:**
  - Use structured activities that require students to solve problems in groups and engage with the material actively.
  - Provide clear, concise feedback after group activities to help students understand and correct their mistakes.
- 4. Regular Feedback and Adjustments:**

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- Collect frequent feedback from students using methods like one-minute papers to understand their concerns and adjust teaching strategies accordingly.
  - Address student feedback promptly to maintain a positive learning environment.
- 5. Emphasize Metacognitive Skills:**
- Teach students about metacognitive strategies to improve their ability to judge their own learning accurately.
  - Encourage self-reflection on learning processes and outcomes to build better self-regulation skills.
- 6. Address Perceptions of Fluency:**
- Discuss with students the concept of cognitive fluency and how it can mislead them about their learning.
  - Highlight the difference between feeling like they are learning and actual learning, using examples from the study.

By implementing these practices, educators can help students overcome initial resistance to active learning, improve their engagement, and enhance their overall academic performance in STEM courses.

## Inverted Teaching: Applying a New Pedagogy to a University Organic Chemistry Class

Christiansen, Michael A. 2014. Inverted Teaching: Applying a New Pedagogy to a University Organic Chemistry Class. *Journal of Chemical Education* 91(7): 1845-1850.

### Keywords

- Inverted teaching
- Flipped classroom
- Organic chemistry
- Student-centered learning
- Blended learning

### Summary

Michael A. Christiansen's study explores the implementation of inverted teaching (IT) in a sophomore organic chemistry class at Utah State University. Inverted teaching, where lectures are delivered online for students to watch outside of class and traditional homework is done in class, was compared to traditional lecture (TL) methods. The study assessed student performance, engagement, and accountability through surveys and academic results from two groups taught by these methods. Findings showed that students in the IT group performed comparably to those in the TL group but initially required an adjustment period to become accustomed to the new method. By the end of the semester, the majority of students preferred the IT approach, citing flexibility and enhanced understanding as key

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benefits. However, IT required more preparation time from the instructor and a strategic approach to ensure students watched the online lectures.

### Practical Actions Recommended

1. **Prepare Comprehensive Video Lectures:**
  - Record and post lecture videos well in advance using tools like Camtasia Studio, incorporating PowerPoint slides and picture-in-picture narrations.
  - Ensure videos are accessible and can be reviewed multiple times by students at their own pace.
2. **Implement Formative Quizzes:**
  - Use short, weekly quizzes at the beginning of each class to ensure students have watched the lecture videos.
  - Include non-conceptual questions from the videos to verify viewership and engagement.
3. **Encourage Group Problem-Solving:**
  - Dedicate class time to group work on problem sets, encouraging collaboration and peer teaching.
  - Use a peer grading system to promote accountability within groups and ensure active participation from all members.
4. **Facilitate Just-in-Time Teaching:**
  - Provide targeted, short lectures during class to address specific questions and misconceptions that arise during group work.
  - Walk around the classroom to observe and assist students, offering immediate feedback and support.
5. **Allow an Adjustment Period:**
  - Recognize that students may need time to adjust to the IT approach. Collect and address feedback regularly to smooth the transition.
  - Conduct mid-semester and end-of-semester surveys to gauge student preferences and adjust the teaching strategy as needed.
6. **Manage Instructor Preparation Time:**
  - Be prepared for a significant initial time investment to create and edit lecture videos. However, consider the long-term reusability and broader impact of these materials.
  - Plan and script lectures carefully to ensure clarity and conciseness, reducing unnecessary content.

By adopting these practices, educators can effectively implement inverted teaching to enhance student learning, engagement, and accountability in STEM courses, while also managing the increased preparation demands on instructors.

## Moving from Critical Assessment to Assessment as Care

Arellano Douglas, Veronica. 2020. Moving from Critical Assessment to Assessment as Care. *Communications in Information Literacy* 14(1): 46-65.

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## Keywords

- Assessment
- Ethic of care
- Relational cultural theory
- Teaching
- Value
- Critical library instruction

## Summary

In her article, Veronica Arellano Douglas explores a transformative approach to assessment in academic libraries, advocating for a shift from traditional critical assessment to an ethic of care. Douglas critiques the current language of assessment, which is often rooted in demonstrating value to external stakeholders, and instead proposes a care-based assessment framework informed by relational-cultural theory and critical generosity. This approach emphasizes the importance of relationships, mutual empathy, and holistic understanding in the assessment process. Douglas argues that assessment should focus on the well-being and growth of both students and educators, fostering connections and valuing individual experiences. By adopting assessment as an act of care, academic libraries can create more meaningful and supportive learning environments.

## Practical Actions Recommended

- 1. Adopt a Relational-Cultural Approach:**
  - Recognize the importance of relationships and mutual empathy in the assessment process.
  - Foster a sense of connection and understanding between educators and students.
- 2. Focus on Individual Needs:**
  - Assess the unique needs and strengths of each student through personal interactions.
  - Move beyond standardized tests and pre-tests, which may not capture the full scope of students' experiences.
- 3. Promote Continuous and Holistic Assessment:**
  - Implement ongoing assessment practices that consider the whole person, including their emotional and social contexts.
  - Encourage self-reflection and feedback from students to inform teaching practices.
- 4. Value Educators' Well-being:**
  - Assess the needs and experiences of teaching librarians and faculty to support their professional growth and emotional labor.
  - Advocate for sustainable teaching practices that respect educators' boundaries and limits.
- 5. Create a Caring Assessment Environment:**
  - Develop assessment methods that prioritize care, compassion, and kindness.
  - Use assessment as an opportunity to build trust and solidarity between educators and students.

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### 6. Engage in Reflective Practice:

- Regularly reflect on assessment practices and their alignment with the values of care and connection.
- Be open to making changes that enhance the well-being and learning experiences of both students and educators.

### 7. Emphasize Ethical and Value-Focused Assessment:

- Question the motivations behind assessment practices and prioritize ethical considerations.
- Shift the focus from proving the value of libraries to embodying values of care and support.

By implementing these practices, educators and librarians can create a more inclusive and supportive learning environment that prioritizes the well-being and growth of all participants, aligning with the principles of centering student learning, fostering belonging, and promoting equitable access to education.

## Structure and Flexibility: Systemic and Explicit Assignment Extensions Foster an Inclusive Learning Environment

Ruesch, J. M., & Sarvary, M. A. (2024). Structure and flexibility: systemic and explicit assignment extensions foster an inclusive learning environment. *Frontiers in Education*, 9, 1324506. doi:10.3389/educ.2024.1324506

### Keywords

- Inclusive education
- Assignment extensions
- Universal Design for Learning
- Student retention
- Flexibility in deadlines
- Self-Determination Theory

### Summary

The article by Ruesch and Sarvary explores the implementation of an "Extension Without Penalty" (EWP) system in a large introductory biology course. The EWP system allows students to submit assignments by an extended deadline without penalty, thereby reducing stress and accommodating personal challenges such as illness or academic pressure. The study found that 78% of students used the EWP system, primarily reporting benefits in stress reduction, better handling of emergencies, and improved performance in other courses. There was no significant difference in final grades between students who used the EWP system and those who did not. The authors argue that this approach creates a more inclusive and equitable learning environment by removing biases and accommodating diverse student needs.

### Practical Actions Recommended

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1. **Implement Explicit Extension Policies:**
  - **Clear Communication:** Clearly state the availability and conditions of the EWP system in the course syllabus.
    - Example: Include a statement like, "All assignments have ideal due dates and extension due dates, which can be used without penalty."
2. **Promote Understanding of Extension Use:**
  - **Inform Students:** Regularly remind students about the EWP system and its benefits to ensure they are aware of their options.
    - Example: Discuss the EWP system during the first class and before major assignments.
3. **Reduce Instructor Bias:**
  - **Systemic Application:** Apply the extension system universally to avoid biases in granting extensions.
    - Example: Automate the EWP deadlines in the learning management system to ensure consistent application.
4. **Support Student Mental Health:**
  - **Stress Reduction:** Use the EWP system to help reduce student stress and improve overall well-being.
    - Example: Share testimonials or data showing how the EWP system has helped previous students manage their workload better.
5. **Encourage Time Management:**
  - **Balancing Deadlines:** Offer both ideal and extension deadlines to help students develop better time management skills.
    - Example: Provide workshops or resources on time management and planning to complement the EWP system.
6. **Monitor and Adjust the System:**
  - **Feedback Collection:** Regularly collect student feedback on the EWP system to make necessary adjustments and improvements.
    - Example: Conduct mid-semester surveys to gather student perceptions and suggestions regarding the EWP system.
7. **Ensure Academic Rigor:**
  - **Maintain Standards:** Ensure that the EWP system does not compromise the academic standards and learning objectives of the course.
    - Example: Analyze assignment quality and student performance data to confirm that learning outcomes are met.
8. **Foster an Inclusive Environment:**
  - **Universal Design:** Align the EWP system with Universal Design for Learning (UDL) principles to cater to a diverse student body.
    - Example: Design assignments and assessments that are flexible and accessible to all students, considering various learning styles and needs.

## Moving Toward Equity: Experiences With Ungrading

Rapchak, Marcia, Africa S. Hands, Merinda Kaye Hensley. 2023. Moving Toward Equity: Experiences With Ungrading. *Journal of Education for Library and Information Science* 64(1): 90-98.

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## Keywords

- Ungrading
- Equity
- Anti-racist pedagogy
- Library and information science education (LIS)
- Student autonomy
- Critical pedagogy

## Summary

The article by Rapchak, Hands, and Hensley explores the practice of ungrading within the context of library and information science (LIS) education, advocating for its adoption to create more equitable and inclusive learning environments. Ungrading challenges traditional grading systems, which often perpetuate inequities and reflect white, middle-class standards. The authors share their personal experiences with implementing ungrading, highlighting how this approach empowers students to take responsibility for their learning, fosters a more collaborative classroom dynamic, and encourages critical thinking and growth. They discuss various ungrading strategies, such as self-evaluation, metacognitive reflection, specifications grading, and contract grading, which prioritize student learning and development over numerical grades. The article argues that ungrading can dismantle power imbalances in the classroom and promote a more just and inclusive educational experience.

## Practical Actions Recommended

- 1. Implement Self-Evaluation and Reflection:**
  - Encourage students to evaluate their own work and reflect on their learning processes.
  - Use self-reflection assignments to help students identify their strengths, challenges, and areas for improvement.
- 2. Provide Qualitative Feedback:**
  - Replace grades with detailed qualitative feedback that guides student learning and development.
  - Focus feedback on encouraging growth, creativity, and critical thinking.
- 3. Adopt Specifications Grading:**
  - Outline clear, specific criteria for assignments that students must meet to achieve a "complete" status.
  - Allow students to revise and resubmit incomplete assignments based on feedback.
- 4. Use Contract Grading:**
  - Develop grading contracts that specify the requirements for each grade level, emphasizing effort and learning over performance.
  - Negotiate these contracts with students to align with their individual learning goals.
- 5. Foster a Collaborative Classroom Environment:**
  - Create a learning space where students and instructors work together as co-learners.

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- Encourage peer feedback and group work to build a sense of community and shared responsibility.
6. **Promote Equity and Inclusion:**
    - Recognize and address the ways traditional grading can reinforce systemic inequities.
    - Implement ungrading practices that are flexible and considerate of students' diverse backgrounds and circumstances.
  7. **Gradual Implementation:**
    - Start with ungrading for low-stakes assignments or specific course components to ease the transition for both students and instructors.
    - Gradually expand ungrading practices as comfort and familiarity with the approach grow.

By adopting these ungrading practices, educators can create a more inclusive and equitable classroom environment that centers student learning, promotes transparency, and fosters a sense of belonging and autonomy among students.

## Fostering Inclusive Communities Through a Student-Constructed Open Pedagogy Textbook

McGowan-Kirsch, Angela M., and Kelly Soczka Steidinger. "Fostering Inclusive Communities Through a Student-Constructed Open Pedagogy Textbook." *College Teaching* (2024): 1-5.

### Keywords

- Diversity
- Open Educational Resources (OER)
- Open Pedagogy
- Renewable Assessment
- Social Justice

### Summary

The article by Angela M. McGowan-Kirsch and Kelly Soczka Steidinger discusses the implementation of a learner-centric open pedagogy approach through a student-constructed open pedagogy textbook. This innovative educational strategy involves students creating, editing, and remixing course content to produce a renewable educational resource. The authors emphasize the benefits of this approach, including empowering students to present their unique identities, integrating diverse perspectives, and promoting social justice. By engaging in this process, students not only enhance their understanding of the subject matter but also contribute to the creation of educational materials that reflect the voices and experiences of marginalized communities.

### Practical Actions Recommended

1. **Encourage Student Authorship:**



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- **Action:** Have students create and remix content for an open-access textbook.
  - **Example:** Students write chapters using their authentic voices and include diverse perspectives and multimedia.
2. **Facilitate Group Collaboration:**
- **Action:** Assign students to work in groups to complete textbook chapters.
  - **Example:** Groups collaborate on writing, editing, and integrating social justice principles into their chapters.
3. **Integrate Social Justice Principles:**
- **Action:** Emphasize the importance of including sociocultural diversity in the textbook.
  - **Example:** Encourage students to include visuals and narratives that respect cultural and gender differences.
4. **Provide Scaffolding and Support:**
- **Action:** Break down the assignment into manageable tasks with clear deadlines.
  - **Example:** Steps include constructing annotated references, writing drafts, seeking peer feedback, and revising based on instructor feedback.
5. **Address Technological and Privacy Concerns:**
- **Action:** Ensure students have access to necessary technology and can choose how to attribute their work.
  - **Example:** Use collaborative tools like Google Docs and allow students to use pseudonyms if preferred.
6. **Promote Reflective Learning:**
- **Action:** Include reflective components where students assess their contributions and learning.
  - **Example:** Use peer assessments and self-reflection prompts to encourage students to evaluate their teamwork and understanding.