The Road Less Traveled: Encouraging Diversity and Inclusion in STEM Fields and Other Special Topics by Leveraging Lived Experience

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Agenda

- Introduction and Background Research
- Leveraging Personal Experience to Encourage Inclusion
- Relationship Between STEM, Diversity, and Inclusion
- Teaching Methods that Encourage Inclusivity
- Best Practices For Teaching and Assessment
- Discussion, Recap, and Resources

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Introduction and Background Research

Background

- One factor that post-secondary education must address is the low percentage of underrepresented students who pursue STEM careers.

- General education courses, including composition, have both the opportunity and obligation to encourage all students to consider STEM careers.

- Faculty may encounter roadblocks, including curriculum and assessment limitations, faculty comfort, and student reluctance.

Session Description

This session explores how leveraging personal experiences in teaching and learning can overcome these obstacles while promoting equity and preparing students for an increasingly diverse world.

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The Role of Higher Education in Improving Diversity and Equity

- As part of their greater mission, educational institutions must commit to identifying and addressing the root causes of inequity, especially in online programs that tend to serve older, more diverse populations.

- One solution to the problem involves leveraging the reach of general education that serves most if not all students.

- For example, mandatory courses such as first-year composition engage almost every undergraduate student who enters a college or university.

Learning Outcomes

Understanding how to leverage the connections between personal experiences, diversity, inclusion, and exploration of STEM topics starts developing best practices for general education faculty to use when encouraging this exploration. This session will:

- Define how general education courses can leverage personal experiences of faculty and students to encourage exploration of diversity and inclusion as well as the pursuit of STEM career.

- Discuss how addressing diversity and inclusion in STEM careers addresses greater diversity and inclusion issues;

- Demonstrate teaching methods such as modeling and questioning that encourage exploration of diversity, inclusion, and STEM subjects even within the standardized curriculum; and

- Begin developing a list of best practices general education faculty can employ to encourage students to explore diversity, inclusion, STEM careers, and other special topics.

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Leveraging Personal Experience to Encourage Inclusion

Why General Education to Promote Inclusivity in STEM?

- High-touch general education courses have both the opportunity and obligation to explore diversity and inclusion and encourage all students regardless of race, gender, or other factors to consider STEM careers.

- These efforts can encounter roadblocks, including faculty comfort, student reluctance, and curriculum or assessment limitations.

- Leveraging students' personal experiences in learning overcomes these obstacles while promoting equity and preparing students for the increasingly interdisciplinary and diverse nature of their personal and professional lives, including exploring their options for pursuing STEM careers.

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Personalizing Learning

- While general education faculty often champion diversity and inclusion, they may not be comfortable evaluating writing about STEM concepts.

- Students – mainly those new to higher education - may express a reluctance to discuss their experiences with diversity and inclusion or even fear STEM-related coursework.

- Leveraging the personal experiences of both students and faculty diffuses these issues.

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The Power of Lived Experience

- Students and faculty can share lived experiences to spark discussion about diversity and inclusion born of reality, not theory.

- Neither faculty nor students must have advanced knowledge of STEM topics.

- Instead, some experience or even interest can be tapped to improve writing because research shows that high-level writing skills develop organically regardless of understanding of the discipline.

Relationship Between STEM, Diversity, and Inclusion

STEM Diversity or Lack of Therefore

- According to the National Science Foundation (2018), the rampant growth of STEM careers in the last decade has not been accompanied by a parallel increase in underserved populations entering these professions.

- Research demonstrates that one cause of this disparity is that STEM professions lack candidates from the very underserved populations that online programs attract (Giuriceo and McLaughlin, 2020).

- All post-secondary education institutions, especially online programs, must address diversity and inclusion issues, including but not limited to the low percentage of underrepresented students who pursue STEM careers.

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Taking a Holistic Approach

- Improving those skills can be a cross-disciplinary process that disentangles the concepts of writing skills development from the ideas of growth of expertise in a particular field of study (Gere et al., 2018).

- This approach supports equity among learners from all demographics and encourages organic exploration of multiple topics, including diversity, inclusion, and STEM (Hunter, 2010).

- It also fosters more active engagement with writing (Reardon & Wulff, 2015).

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Possible Curriculum Limitations
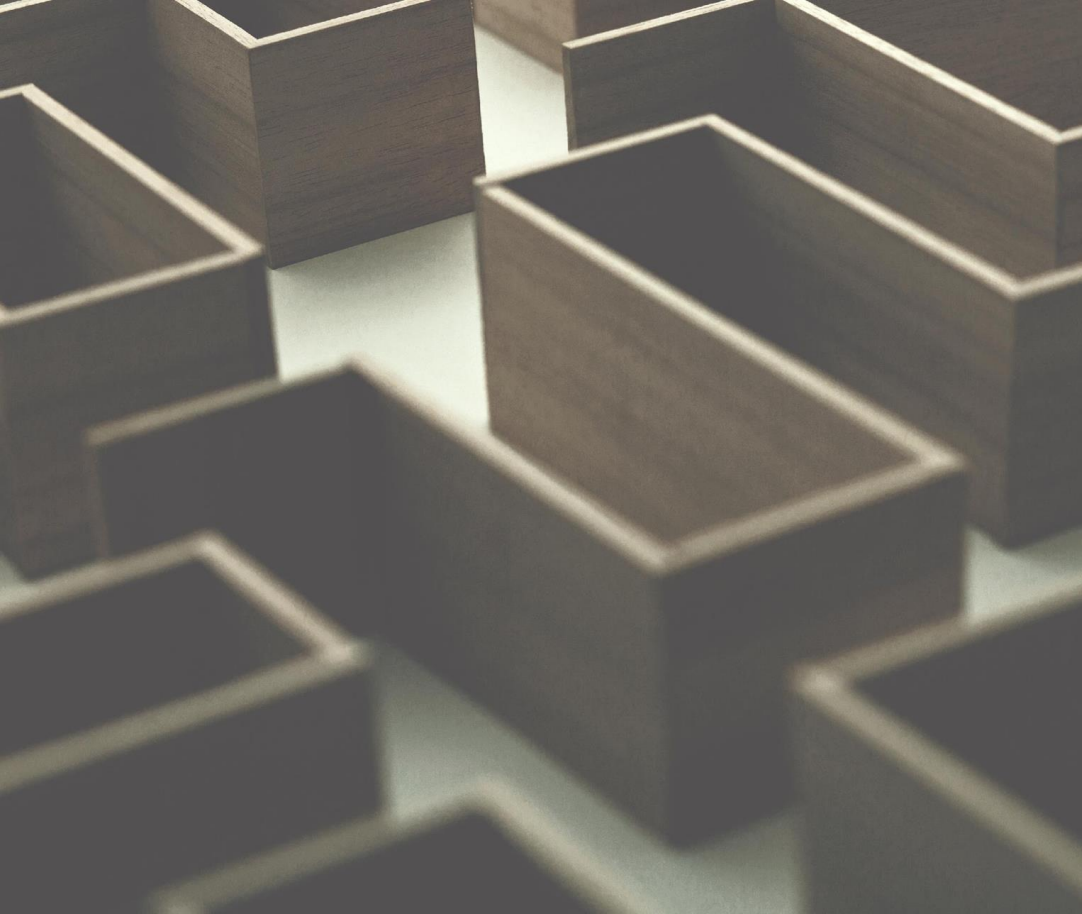
- Curriculum and assessment limitations play a role, especially in online programs that primarily serve older, more diverse populations than traditional delivery modalities.

- Online programs tend to utilize standardized curriculums and assessments that define topics, assignments, and grading expectations for all particular course sections.

- Such prescribed course content leaves little room to encourage students to explore diversity and inclusion or STEM on the surface.

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Teaching Methods that Encourage Inclusivity

Relationship to the Writing Process

- For instance, composition students at Purdue Global write about problem-solving, changes, and professional issues in their field for specific personal, professional, and academic writing assignments.

- However, all of the assignments begin the writing process with student experiences.

- With prompting similar to a call for special topics for a conference or journal, many students can be encouraged to connect their own experiences to issues related to diversity, inclusion, STEM, or any relevant "special topic.

- All students are writing about and collaborating with peers about a wide variety of topics, including inclusivity, diversity, and STEM fields, without substantial modification to existing assignments or assessments.

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Applying the Process to Composition

- Encouraging students to explore special topics such as diversity, inclusion, and STEM via general education courses like composition is ideal.

- Most students take these courses early in their academic careers.

- Courses serve a diverse student population with varied experiences and interests, and they allow students to read one another's work and explore unfamiliar topics.

- Understanding the interconnections between personal experiences, diversity, inclusion, and STEM subjects and leveraging those connections is a step in the right direction towards developing best practices for general education faculty to encourage student exploration of various special topics.

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Examples from CM 107

ASSIGNMENTS

- Analyzing audience, main point and writing strategies in professional blogs and peer-reviewed journal articles in the students' fields (Unit 2 Assignment)
- Sharing personal experience with a problem in the field with a non-professional audience (Unit 4 Blog Post Assignment)
- Analyzing the cause or effect of a change or trend within the students' field of study (Unit 6 and Unit 8 Academic essay with sources)
- Recommending a solution to a problem within an organization (Unit 9 Proposal Memo)

STUDENT PAPER TOPICS INCLUDE

- Ethical concerns in accounting
- Increased application of cloud computing
- Recycling practices in businesses
- Effects of climate change
- Changes in construction materials for homes
- Growth of wind/solar energy
- New strategies for combating forest fires
- Methods for reducing turnover in nursing field
- Causes of the increase in cyberterrorism

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Examples from CM 220's "Idea for Change" Proposals

- Reducing carbon emissions and energy use in Denver, CO to improve air quality
- Amending Indiana community's HOA charter to allow residents to install solar panels
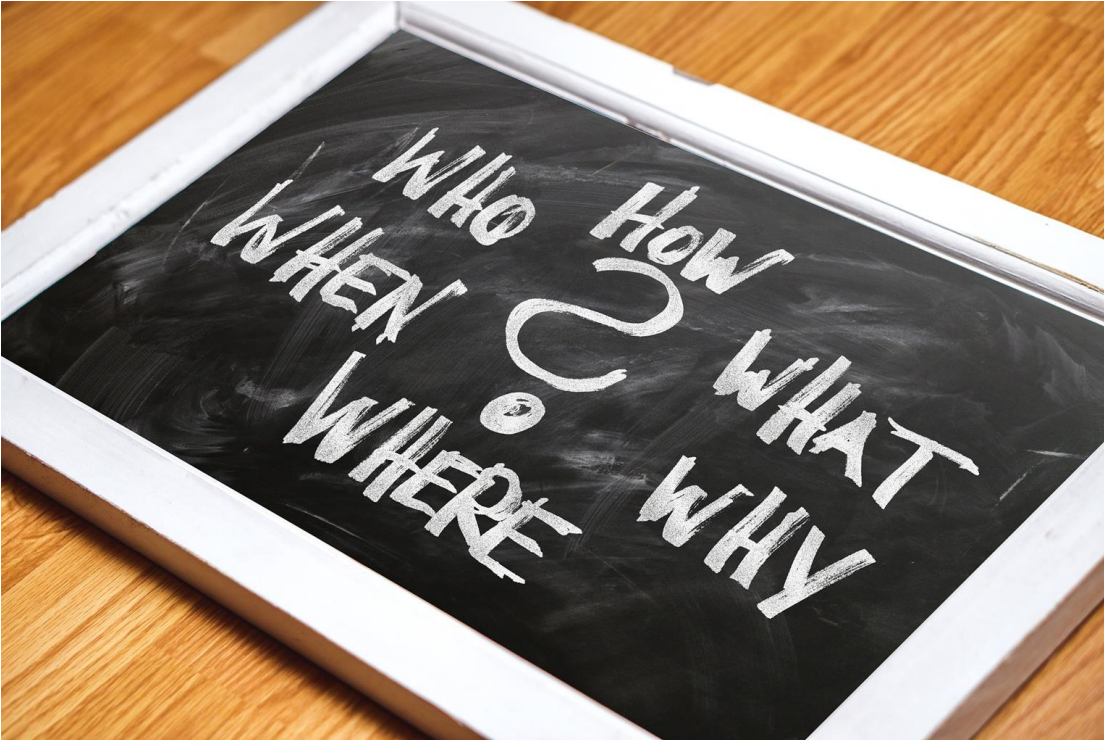- Addressing invasive Tilapia in Orlando, FL waterways

Photo by Vivint Solar on Unsplash

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CM 220: Developing a Thesis/Hypothesis

Image by Gerd Altmann from Pixabay

- Comparing the development of an enthymeme to the process of scientific investigation
- Reviewing TED talks about discovery and innovation
- Discussing the importance of evaluating sources for credibility
- Emphasizing that paraphrasing scientific information with more accessible terminology expands our audience

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Accessible STEM Resources

- Alan Alda Center for Communicating Science at SUNY Stony Brook emphasizes the importance of effective communication for those in STEM fields
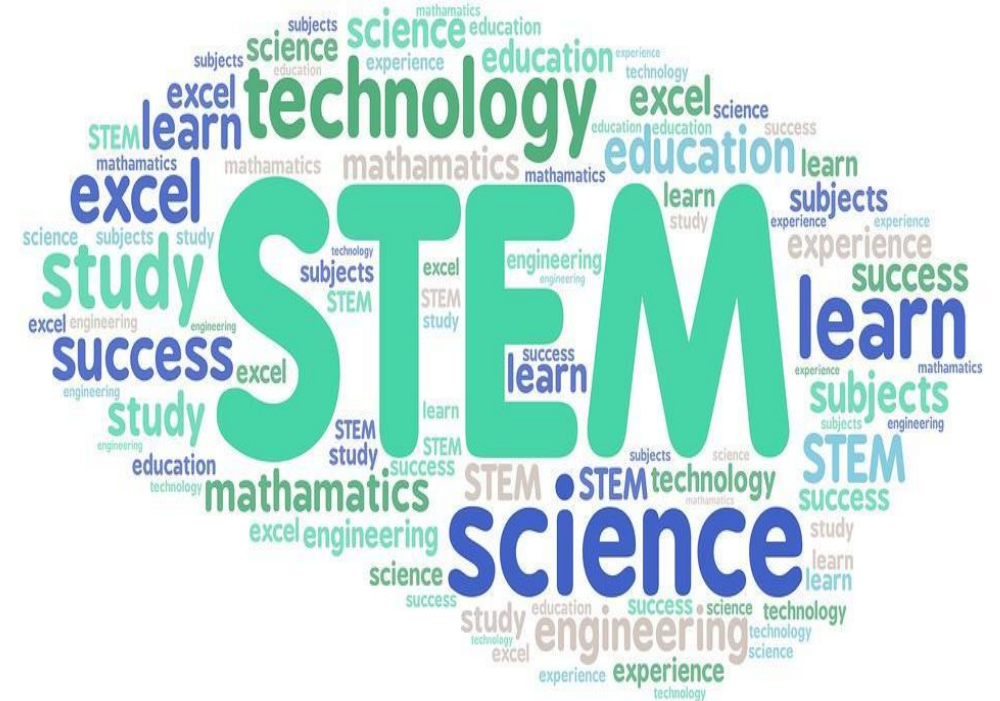- *Science Friday* on NPR
- *Science News*

Image by ar130405 from Pixabay

Best Practices For Teaching and Assessment

Best Practices for Teaching

- Build Disciplinary Literacy and Content Literacy
- Support sharing of Experiential Learning
- Stress the value of effective writing skills in STEM fields
- Support the growth of the ability to write in various genres (proposals, grants, lab reports)
- Emphasize genre-specific style and expectations
- Stress the personal and professional benefits of improved communication skills
- Incorporate collaboration
- Leverage Writing Center and WAC resources

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Best Practices in Assessment

- Tie assessment to future class assignments and future professional endeavors
- Reconsider "traditional" grading as a tool for explaining grades
- Provide guidance that helps students develop stronger Genre Organization, Style and Sentence Structure that is concise and mimics professional expectations, and Precise Word Choice
- Feedforward rather than feedback to nurture student growth and development

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Best Practices in Assessment, Part II

- Foster WAC partnerships within General Education and or university wide with faculty, advisors, and staff
- Leverage DEI, STEM, and WAC perspectives when revising rubrics
- Revisit Course Learning Outcomes, Professional Competencies, etc., frequently to ensure DEI and STEM representation for stakeholders
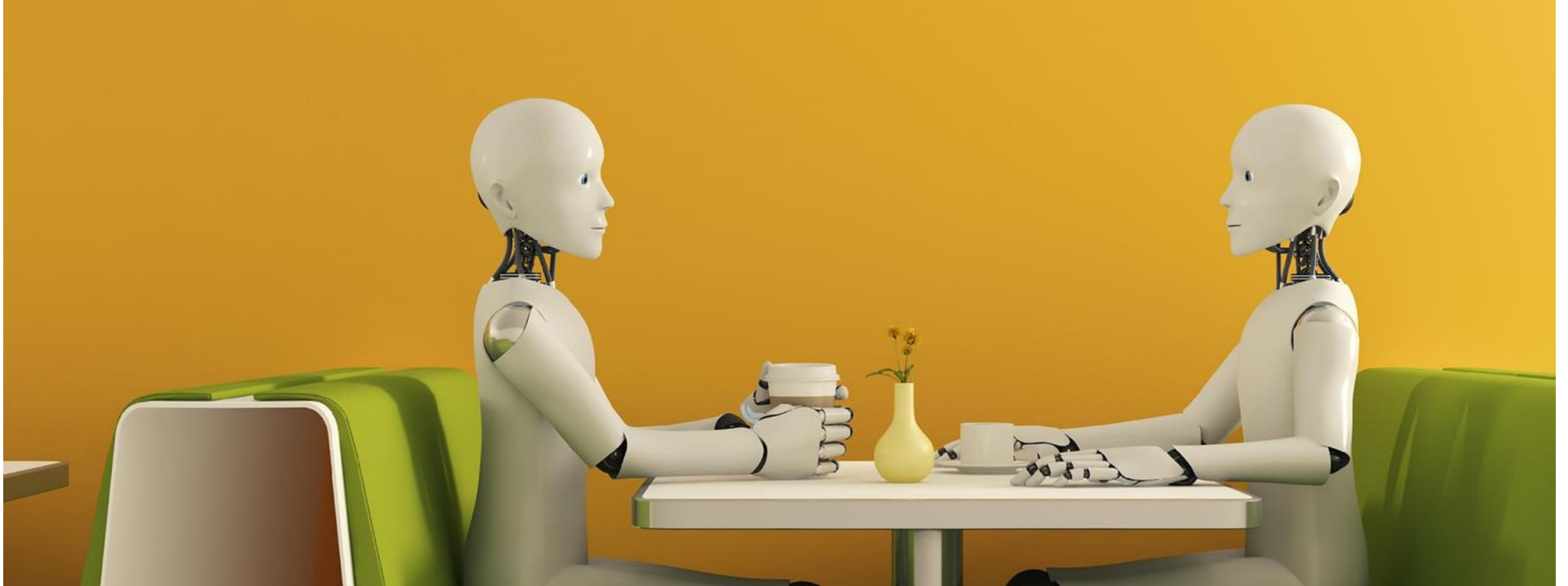- Assess assessment

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Discussion, Recap, and Resources

Discussion and Recap

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