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# Does integrating active learning into a content-intensive science course work?

*Sam Lau*

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**Science** is fun and  
fascinating. Why not  
the same for **science**  
**education?**

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the role of **active**  
**learning** in improving  
the quality of **science**  
**education**

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## Active Learning

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Ample research demonstrates that students are more engaged and motivated in active learning process and have deeper understanding of the content

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## Active Learning

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### Higher student achievement and engagement

- examination scores improved by 6%
- traditional lecturing were 1.5 times more likely to fail

Freeman, Scott, Sarah L. Eddy, Miles McDonough, Michelle K. Smith, Nnadozie Okoroafor, Hannah Jordt, and Mary Pat Wenderoth. "Active learning increases student performance in science, engineering, and mathematics." *Proceedings of the National Academy of Sciences of the United States of America*, vol. 111, no. 23, 2014, pp. 8410-8415.

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## Active Learning Strategies

1. Case Study Discussion
  2. Think-Pair-Share
  3. Game-based Formative Quizzes
  4. Partial Powerpoint
  5. Pause Procedure
  6. One-minute Paper
  7. Flipped Learning
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L1: Review to KEEP UP my progress [Edit](#)

How best do you digest the materials of Lecture 1?

Play ▶

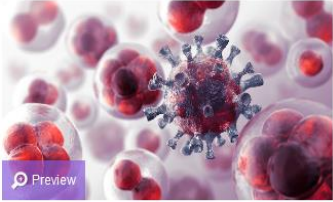
Challenge ⚡

Preview 📄

Favorite ★

Duplicate 🔄

Share 📧



Preview

Type: Quiz Visibility: Private Created: 2 months ago By: SamMicrobes Audience: University Language: English

10  
Questions3  
Plays40  
Players0  
Favorites0  
SharesQuestions [Show ALL answers](#)1. I am a prokaryote and live in extreme environment. Who am I? [Show answers](#)30  
Seconds4  
Choices2. Which is not considered as a microbe? [Show answers](#)30  
Seconds4  
Choices3. What is the term we used to describe a disease-causing microorganism? [Show answers](#)30  
Seconds4  
Choices

## L2: One-minute Paper

Form description

1. What would you say was the most important and useful point in the class? \*

Short answer text

2. What would you say was the most stimulating idea discussed in today's class? \*

Long answer text

3. What example or case study cited in today's class could relate to YOU the most? \*

Short answer text

4. What is the main unanswered question you leave class with today? \*

Short answer text

5. Any other comments or feedback on today's class? \*

Short answer text

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## Sharing

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Microbiology is perceived as a content-intensive course

Microbiology is perceived as a difficult course

Active learning increased interests in learning

Active learning enhanced the learning

Active learning helped the performance in assessment

Active learning is the preferred way of learning

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**Looking forward.....**

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