Teaching Strategies to Enhance Engagement and Learning in Computer-Mediated Courses

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BACKGROUND
To facilitate the delivery of new modularized developmental math curricula, many community colleges in VA and NC are making use of instructional software in the classroom. Evidence suggests that “emporium-style” approaches can improve student success (Twigg, 2011). However, few studies have explored teaching and learning processes in computer-mediated instructional delivery models.

Among the myriad of factors known to influence student learning in these course structures, feedback to students stands out as one of the most important (Vrasidas & McIsaac, 1999). In order to deliver feedback to students, teachers must receive feedback on what students know and understand.

RESEARCH QUESTIONS
✓ What is the nature of feedback on student learning in computer-mediated classrooms?
✓ What teaching strategies support student learning and engagement in computer-mediated classrooms?

RESEARCH CONTEXT
Research conducted in two community college systems in which developmental mathematics courses were recently redesigned.

Key components of redesigns:
• Modularized curriculum and diagnostic placement instrument
• Mastery model
• Many colleges offer “computer-mediated” courses

In computer-mediated developmental mathematics courses students work independently learning content via software. Instructors provide instruction or assistance as needed.

DATA SOURCES
Data Collected at 12 Community Colleges
Interviews/focus groups with developmental math students 60
Interviews/focus groups with developmental math instructors 42
Observations of computer-mediated and hybrid classes 18
Observations of instructor-led classrooms 7

NATURE OF FEEDBACK
Computer-mediated settings have the potential to provide a greater volume of immediate feedback to students and instructors about student performance and progress.

Instructors report that they have less information about student understandings of math concepts than they might if they were grading written homework or facilitating class discussions.

Feedback to Students:
“That’s what drives me crazy actually...not seeing their thought patterns. When I used to grade homework, I kind of looked through to see if there were any trends and maybe I’ll say, “watch this,” and circle it a couple of times. But now I don’t really see their written work until they take a test.”
- Math Instructor

Feedback to Instructors:
Instructor receives precise feedback on student performance and progress through software.

Instructors report that they are unaware of “steps students take to get to the final answer.”

Computer-generated analytics can provide detailed information about whole-class and individual performance on particular objectives and items.

COMPARING FEEDBACK ACROSS COURSE MODELS

Instructor-Led Course | Computer-Mediated Course
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**Feedback to Instructors**
Instructor receives informal feedback on student understanding during lecture through eye contact and body language.

Instructor discovers student misunderstandings by listening to student talk in discussion and grading written work.

Instructor receives precise feedback on student performance and progress through software.

Instructors report that they are unaware of “steps students take to get to the final answer.”

Computer-generated analytics can provide detailed information about whole-class and individual performance on particular objectives and items.

**Feedback to Students**
Instructor takes one or more class periods to grade and return written work.

Instructor solicits questions from students, and the whole class benefits from the answers.

Students receive immediate feedback on performance on homework and assessments.

Students who seek help receive in-class, one-on-one instruction.

Instructor provides personalized feedback and adjusts pace of instruction based on identified areas of weakness.

Students receive generic feedback messages as provided by the software.

TEACHING STRATEGIES
Findings suggest that teaching strategies targeted for a computer-mediated learning environment may help instructors retrieve actionable information about student learning and provide tailored feedback in response.

Use class time for instructor-student and student-student interaction.

- Students in a computer-mediated class may feel that they have to “teach themselves.” Show them that they are not working in isolation.
- Have a conversation with every student, every time the class meets. (This requires a manageable class size.)
- Group students who are working on the same or similar material together.
- Use frequent “mini-conferences” to discuss progress, successes, and challenges in the course.

Scaffold help-seeking strategies among students

- Move around the room and watch to see which students appear frustrated.
- Help students who ask for assistance, but don’t neglect the other students. Some people are afraid to ask for help.
- Give positive feedback!

Become proficient in using computer-generated data on student performance and progression

- Review each student’s progress before class starts.
- Consider collecting additional information to understand students’ thought processes

For more information:
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