

Product Name MyLabsPlus

Course Name College Algebra

Course Format Emporium: open lab + face-to-face discussion, fixed due dates

Key Results

In a survey of 94 students, the Help Me Solve This learning aid in MyLabsPlus was perceived by the students to develop their mathematical understanding and provide an alternative perspective on how to solve mathematical tasks.

Submitted by

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Course materials

Precalculus: A Unit Circle Approach, Ratti and McWaters

Background

Research shows that the use of technology enhances the teaching and learning of mathematics and that online learning can provide students beneficial flexibility and convenience for completing assignments, while having prompt access to information. Advances in online tools have provided students more opportunities to self-pace and work independently. MyMathLab, which is accessible online, enables educators to manage assignments, share multimedia resources, and provide individualized study plans for students. A 2007 study by Spence and Usher found that students' MyMathLab courseware engagement and self-efficacy were strongly correlated.

Tasks in MyMathLab are presented with various options to aid in processing the learning of the concept; some of these options include Help Me Solve This, View an Example, Ask My Instructor, Textbook, Animation, and Video (Figure 1). The Help Me Solve This tool, in particular, is an interactive resource that assists students in solving mathematical tasks assigned for homework. Students can use the tool for contextual guidance, but are expected to provide responses at critical points in an effort to solve tasks. After two attempts, if an incorrect response is given, the computer will provide the correct solution and proceed to the next step. After the mathematical task is solved, a similar algorithmically generated task is assigned for the student to solve without assistance. A key icon is used to depict the Help Me Solve This tool in MyMathLab (Figure 1).

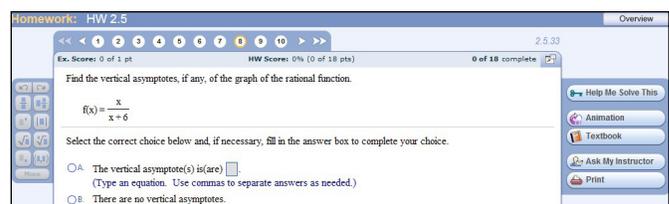


Figure 1. Example of a MyMathLab Student Task Showing the Help Features

Challenges and Goals

Mathematics faculty at the University of South Florida examined students' perceptions of the MyMathLab support tools that can assist in the conceptualization of mathematical ideas. More specifically, Sears, et al. sought to document students' perceptions of how the Help Me Solve This tool assisted in their learning of mathematics.

Implementation

Study Methodology

A mixed method research design was employed. At the end of the spring semester of 2012, data were collected via an online survey and standardized open-ended interviews. Students were asked to identify the resources they used when faced with difficult mathematical tasks, and the resources that helped them to master algebraic materials. In addition, students were encouraged to share their perspectives about the various resources used to teach college algebra and the extent to which these resources were helpful in learning algebraic ideas. The survey instrument asked 94 students to use a Likert scale (from 1 through 5) to rate how the MyMathLab resources assisted with learning mathematical content. Also, students were asked to identify which resource they would most likely use if they experienced difficulty with homework assignments.

Follow-up interviews were conducted with 20 students from the sample of 94 students. Questions posed included: Which resources helped you the most to master the mathematical

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content? What were your likes and dislikes about the various resources used to teach the mathematical content? Students were asked to explain their responses. Descriptive statistics were generated from the survey data and thematic analysis was used to identify emergent themes.

Participants

Ninety-four of 312 students enrolled in a redesigned college algebra course volunteered to participate in the study. The redesigned course format had 75 minutes of lecture, which reduced the original lecture time by one-half, and students were required to complete three hours in a SMART Lab, which provided students an opportunity to work on solving mathematical tasks, and obtain personal assistance from instructors, peer tutors, and teaching assistants. Thus, the redesigned course increased the opportunity for self-regulated learning.

Results and Data

The survey results found that the Help Me Solve This tool was the resource used most frequently and that students had a positive disposition toward it. Eighty percent of the students who completed the survey reported that they used the Help Me Solve This tool to solve tasks perceived to be a challenge. They also reported that the tool aided in learning mathematical ideas, provided an alternative perspective to think about mathematical tasks, and increased opportunities to work independently.

Students appreciated having access to the Help Me Solve This tool for homework assignments. One student stated, "I love Help Me Solve This," while another reported, "It's awesome."

The tool assisted students in gaining a deeper understanding of algebra. In some instances, it was viewed as an instructional aid that complemented classroom teaching. For instance, a student stated, "I like it because sometimes when my professor speaks in the lecture hall, I don't get exactly what he is saying. When I use Help Me Solve This, it shows me step by step what to do." In addition, the tool was perceived as a secondary tutelage. One student commented, "Since we only have lecture once a week, I feel like it's sort of the virtual teacher. And it teaches you." Hence, students use the Help Me Solve This tool to enhance their understanding.

Moreover, the Help Me Solve This tool provided a means to view an alternative perspective to solve the problem. A

student claimed, "Sometimes like when I hit Help Me Solve This it's totally different from what [my professor] teaches in the lecture hall. Both ways are helpful, but I use whichever one is easier." Similarly a student alluded to using videos in addition to the Help Me Solve This tool. The student said, "I use videos sometimes, but I use Help Me Solve This so that I really get to know the step by step. So I can know what is going on with the problem." Gaining multiple insights fostered a conceptual understanding of the mathematical tasks posed.

Some degree of freedom in learning is provided when students use the Help Me Solve This tool. Students can work independently to solve mathematical tasks, even if the strategies to solve such tasks were not discussed during the regular classroom environment. A student noted, "I like this a lot better because I have the online help, to help me right away. As opposed to class, where I have to go to the teacher and be like how do you figure out this problem?" A timid student said, "I'm kind of shy, so I like the Help Me Solve This, I like to figure it out on my own." Therefore, the Help Me Solve This tool can increase students' autonomy in the learning of mathematics.

Conclusion

This study has implications on how the Help Me Solve This tool impacts students' learning, specifically of college algebra. The tool is viewed as a learning aid and provides opportunities for students to reason through the problem independently while gaining a conceptual understanding of mathematics. Furthermore, students generally had a positive disposition toward using the interactive tool, and were readily inclined to use it. It is important that tools included in online learning management systems are perceived as purposeful and used by students.

In addition, The Help Me Solve This tool was identified as a resource students used because they viewed it positively as a means to gain a deeper, step-by-step understanding of mathematical ideas. Resources available within a learning management system should seek to foster mathematical learning and should be scrutinized for the extent it promotes reasoning and develops critical thinking skills. Hence, further study ought to examine additional features of online resources within learning management systems and consider the extent that students use them and the implications they may have on learning.