

MyMathLab & WebAssign: Students' Perceptions of their use in Mathematics

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Abstract: Enhancing students' conceptual understanding and encouraging them to be involved in the classroom discussions are important for instructors of mathematics. The use of technology is an essential part in teaching and learning mathematics as emphasized by The National Council of Teachers of Mathematics *Principles and Standards for School Mathematics*. Web-based homework management systems provide alternatives to the traditional pen-and-paper based approaches. These systems provide a flexible instructional tool that offer students immediate feedback, track their performance, facilitate student-centered environment, allow instructors to give students more frequent assignments, provides the instructors with the ability to create multimedia enhanced questions that can include video, animation, or audio and facilitate students' communications with their instructor. The goal of using these programs is to enhance students' learning and understanding of the different mathematical concepts. The purpose of this paper is to present students' perceptions of the advantages and disadvantages of using web-based homework management systems, in particular MyMathLab and WebAssign.

Keywords: MyMathLab, WebAssign, Mathematics education, Web-based systems

Introduction

The use of web-based homework systems is becoming very popular and is gradually replacing the traditional paper based homework. Many studies have been conducted using web-based homework in chemistry, mathematics, physics and statistics courses (Bliwise, 2005; Bonham, Beichner, & Deardorff, 2001; Cole & Todd, 2003; Dufresne, Mestre, Hart, & Rath, 2002; Freasier, Collins, & Newitt, 2003; Hauk, & Segalla, 2005; Lenz, 2010; Lin, 2009; Pascarella, 2004; Penn, Nedeff, & Gozdzik, 2000; Pennington, 2013; Toback, Mershin, & Nazimova, 2005; York, Hodge & Richardson, 2008; Zerr, 2007).

Some studies focused on students' perceptions of their learning using web-based homework systems (Demirci, 2007; Hauk & Segalla, 2005; Picciano, 2002), while other studies compared between the use of web based homework systems and the use of paper-and-pencil homework (Dufresne, Mestre, Hart, & Rath, 2002; Thoennesen & Harrison, 1996).

Tang and Titus (2002) conducted a study that surveyed students of physics and calculus who used WebAssign on a weekly basis. They found that using WebAssign increased student-instructor as well as student-student interactions. The study also revealed that students put more time and effort on their homework outside the classroom. In addition, they found that the instructors in the study created learning activities based on student feedback.

Pennington (2013) conducted a study that investigated the use of ALEKS as a web-based homework system on student achievement in a college algebra course. Students in this course were required to achieve a 75% correct completion level for the online homework in order to be able to access online quizzes. Pennington collected the data using a pretest, posttest, pre-survey and post-survey methods. The pre-test was used to measure students'

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prior knowledge of the material before taking the course as well as to gather demographic information. The post-survey was used to gain information on students' work ethics, and their feelings towards the use of ALEKS. The researcher found that using ALEKS did not affect students' performance on their final exam but found that it had a positive effect on students' online quiz performance.

Lin (2009) conducted a study to investigate the comparative efficiency of Web-based instruction and traditional teaching methods on preservice teachers' fraction knowledge. Forty- two preservice teachers who were enrolled in two classes (21 students each) participated in this study. The experimental class used Web-based Instruction, while the other class was given traditional instruction. The researcher collected the data using pre- and posttest. The test consisted of 32 items that aimed at assessing students' knowledge of fractions. The other class was assigned as a control group (n = 21) and was given traditional instruction. The analysis of results showed that there was a statistically significant difference between the experimental and the control groups' posttest mean scores in favor of the experimental group.

York, Hodge & Richardson, J. (2008) conducted a study that examined students' perceptions of the use of web-based homework and its effect on their learning and motivation. Participants in the study were 376 university students enrolled in a college algebra class. Participants completed the majority of their homework online. The researchers evaluated students' perceptions of the web-based homework through a survey containing both Likert-scale items and open-ended questions. The researchers found that few students appreciated the immediate feedback, but most of them felt more accountable for completing the assigned work.

In the current study, we focus on two web-based systems; WebAssign and MyMathLab. WebAssign was developed by Dr. John Risley in 1997 to enhance student learning and to support instructors in their classrooms. WebAssign is a flexible web-based instructional system. It provides learners with immediate feedback on their performance thus allowing them to do more practice in the areas they need most help with. Learners may also work on their assignments multiple times until they get the correct answers. Student performance can be assessed on a regular basis.

MyMathLab is an online textbook resource that is used to generate online homework assignments. The system offers instant feedback, step-by-step examples, videos, and tutorials. MyMathLab creates a personalized adaptive study plan based on the collected data targeting each student's individual strengths and weaknesses. The goal of the adaptive plan is to improve student conceptual understanding of different mathematical concepts.

The focus of this paper is students' perceptions of the advantages and disadvantages of their use of MyMathLab and WebAssign in learning mathematics.

Research Question

The aim of this study was to answer the following question: What are students' perceptions of the advantages and disadvantages of using MyMathLab and WebAssign in learning mathematics.

Method

The participants in this study were university students enrolled in two different mathematics classes. One class used MyMathLab and the other one used WebAssign as web- based homework tools. To provide an answer to the research question, data were collected using a survey asking students to provide the advantages and disadvantages of the web-based homework system that they used based on their own experiences during the semester.

Results and Discussions

The purpose of this study was to investigate students' perceptions of the advantages and disadvantages of using MyMathLab and WebAssign in learning mathematics. Participants' responses were summarized and tabulated as follows: (Table 1) provides students' perceptions of advantages and disadvantages of using MyMathLab, and (Table 2) provides students' perceptions of the advantages and disadvantages of using WebAssign.

Table 1. Advantages and disadvantages of using MyMathLab

Advantages	Disadvantages
<p>Sample Replies:</p> <ul style="list-style-type: none"> multiple attempts, practice over and over again. being available to constantly go back and work on it. immediate feedback. the online resources are great, multiple resources such as videos. Convenience. less pressure than turning in paper assignments. online tutoring, help is immediate. you can do it anytime, anywhere, easy access. 	<p>Sample Replies:</p> <ul style="list-style-type: none"> technical difficulties, issues with the internet. abuse of resources; don't retain knowledge. no partial credit. system glitch, you enter the correct answer but the system doesn't accept it. long homework. less friendly than using a paper submission.

Table 2. Advantages and disadvantages of using WebAssign

Advantages	Disadvantages
<p>Sample Replies:</p> <ul style="list-style-type: none"> You get several tries, multiple attempts. lots of practice and variety of problems. ability to work forward or backwards thru a problem to find mistakes. it helps me see that I'm doing something wrong to correct it. easy to get help/online help, it easy to seek help from other websites. immediate feedback, quick feedback and self learning. online tutoring to help students when they don't understand something. more resources that are easy to access. being able to do it anymore on a mobile device 	<p>Sample Replies:</p> <ul style="list-style-type: none"> technical difficulties. slow, not easy to find examples. very difficult to show work so teacher knows in what areas you are struggling. if you do not understand something it is really hard to bring your laptop around places to seek help rather than a piece of paper no paper/pencil work sometimes it is hard to type answer no immediate face-to-face feedback you forget about it

As indicated in the tables above, students pointed out the following advantages to their use of web-based homework systems: the ability to redo the questions multiple times, the ability to get instant feedback, the availability of multiple resources and the flexibility of using the system. They indicated the following as disadvantages to their use of these systems: technical difficulties, forgetting due dates, and missing the use of paper and pencil. More studies are needed to explore how to improve students' experiences with these systems and to further investigate the effects of online homework systems on student achievement and understanding.

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