PROGRAM EVALUATION OF ONLINE FOUNDATIONAL MATH COURSES

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Abstract

This is a mixed-methods program evaluation of the computer-based Math 22–PreAlgebra and Math 23–Practical Algebra pilot courses taught at Maui Community College, Fall 2006, that were designed to meet the needs of non-traditional students unable to attend during the traditional Monday-Friday, 8am-5pm class timeframe. Computer-assisted instruction (CAI) via Plato Interactive Mathematics was the basis for these Internet-based, asynchronous math courses. Cell phone and email were used for student–instructor communication. An anonymous student survey was used to answer the key evaluation questions which are:

- *What aspects of technology worked well and which didn't work well?*
- *What modifications are desirable or necessary?*

Data were collected through a student survey, instructor input, and MCC math and campus information. Based on the results of the evaluation, recommendations regarding future course implementations were generated.

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Introduction

This mixed-methods study is a program evaluation of the computer-based Math 22 – Pre Algebra and Math 23 – Practical Algebra pilot courses taught at Maui Community College during the Fall 2006 semester. These computer-based courses were designed to meet the needs of non-traditional students who cannot attend class during the traditional Monday through Friday, 8 am to 5 pm time frame. Within the three years prior to this pilot implementation, there were no distance-education offerings for remediation-level math courses offered at any campus within the University of Hawaii system. To fill this gap, the Rural Development Project (RDP) undertook the responsibility for the initial design and the implementation of these pilot distance education courses, then turned further implementation over to the Math Department.

Maui Community College (MCC) students who were required to complete the foundational (developmental) math classes Math 22 or Math 23 were eligible to take these pilot online courses. The students self-selected this delivery modality over the other three delivery methods available: traditional face-to-face classroom, innovative classroom, and lab-based. These online courses used computer-assisted instruction (CAI) for an asynchronous math delivery tool. Cell phone and email were used for student–instructor communication. The course consisted of one mandatory face-to-face orientation and training meeting, completion of the required Plato lessons, a weekly comment emailed to the instructor, and proctored mid-term and final exams.

Evaluation of this course will assist in future course planning within the Math Department. One factor in the determination of course continuance is faculty and departmental acceptance of the credibility of online education (Ulmer, Watson, & Derby, 2007). MCC math faculty members have previously expressed mixed opinions as to the worth and validity of this online modality, so these results may help to clarify acceptance. It is important a new program such as this be evaluated rather than just adopted as convenient, or easier, or as part of the latest trend. Evaluation of this program is key to future offerings through faculty acceptance.

To carry out the evaluation, data were collected through a student culminating survey, instructor compiled data from the duration of the course, and general MCC campus information. The study used a mixed qualitative and quantitative approach as recommended by Gaide (2005) with information from the online students collected through an online, anonymous student survey (see Appendix A). Additional data included collective class grades from each of these two classes, plus comparative collective grades from the other delivery methods in these same two courses within the MCC campus. All grades were reported confidentially. Grades have been documented to verify similarity to the other delivery methods of these courses. Evaluation of the student survey provided demographic data on the respondents as well as course-related information and student opinions.

The basic questions for evaluation were:

- What aspects of technology worked well and didn't work well?
- What modifications are desirable or necessary?

The expectation is that the evaluation data will help a number of stakeholder groups. The school administration and Math Department administration will be able to assess whether or not to continue to offer these courses in this modality, and if so, how to better adapt them. Faculty who will or might be asked to teach this course will have suggestions as well as the knowledge of what was done in the pilot. The counselors will have the input of what students thought of this new delivery aiding them in how to best advise future students. Students will benefit as the course can either be further improved or eliminated, as recommended by the results. Recommendations regarding future course implementations have been based on the student data and input of the instructor. With other modality choices also offered, it is anticipated this evaluation will be of great assistance in determining how to allocate human and physical resources within the Math Department at MCC.

Review of Related Literature

Adults returning to college face distinct issues. Many of these non-traditional students are single parents seeking retraining, adults also working full-time, and most have been out of the education field for a number of years (Bichelmeyer & Molenda, 2006). Additionally, many students entering college are not ready for college-level courses. The National Center for Education Statistics (NCES) cites that nearly half of all post-secondary students entering college need at least one remedial course as reported by Karp, Bailey, Hughes, & Fermin (2005). Clearly, further study regarding the educational gap between high school graduation capabilities and college entry requirements needs to be explored. This gap needs to be closed in order for college students to get the maximum benefit from their college-level opportunities.

Delivery

In 2006, QMark Research & Polling was commissioned by the Hawaii Association of Independent Schools and the University of Hawaii to conduct a research study "to obtain reliable information on the knowledge, usage, needs, unmet needs, and barriers to utilization of technology…for post-secondary education" (p. 1). This unpublished study by QMark confirmed that there was statewide interest in Internet-based (online) courses as an alternative to traditional daytime-classroom course delivery. One of the QMark findings was that 66% of those surveyed found classes taken over the Internet were either "very" or "somewhat" appealing, and 81% of those cited convenience as the reason for this appeal. Those that found it not appealing cited lack of

interest, preference for face-to-face classroom interactions, no computer or Internet access, and not being computer literate as their reasons. Based on these criteria, a need was demonstrated by a significant portion of the population for an asynchronous, distance-learning-delivered foundational math pilot (Holden & Westfall, 2006).

Specific to math, research shows that computer-assisted instructional (CAI) math deliveries are highly effective methods for learning math (Fouts, 2000; Handle & Herrington, 2003; Kulik, 2002; Maag, 2004). Kulik & Kulik (1991) reported in the meta-analysis of findings from 254 controlled evaluation studies, that there are reductions in instructional time associated with computer-based learning (CBI), on the average using one-third less instructional time. Time efficiency is especially critical for non-traditional students needing to balance home life, employment, as well as college. Additionally, CBI has been shown to have a small but significant positive effect on student attitudes toward instruction and a positive effect on student attitudes toward the computer (Aivazidis, Lazaridou, & Hellden, 2006; Kulik & Kulik, 1991). Any learning advantage to help a student succeed in their coursework is worth consideration, and particularly important when considering non-traditional learners who face additional obstacles.

Prior to selection as the content delivery mode for these online classes, CAI was evaluated for its advantages and disadvantages (Fouts, 2000; Handle & Herrington, 2003; Kulik & Kulik, 1991; Kulik, 2002; Maag, 2004). Full-motion video and audio in multimedia delivery allow the full spectrum of instructional strategies. Students can control the pace of their learning, repeating when necessary, and can receive immediate feedback for learning reinforcement. The primary weakness reported was a lack of

instructor interaction. The other negative consideration was CAI development costs. As there are a number of companies successfully producing CAI in mathematics, RDP deemed development cost was not a necessary expense and consideration.

Value, Quality, and Success

"Many educators are looking at the way Internet-based learning can provide flexibility and convenience. Internet-based learning can overcome some traditional barriers such as time and place" (Burgess, 2003, p. 2). MCC had been investigating alternative delivery methods for math remediation, and requested that an online delivery method be developed for the foundational math courses and offered Fall 2006. MCC is an example of a trend cited by Pajo & Wallace (2001).

> The use of the Web for delivery of distance courses is a major development that is changing the way knowledge is imparted to the widest audience inside and outside the classroom. These technological innovations are profoundly influencing university practices and policies and may even be fundamentally altering our conceptualizations of education. (p. 2)

As student growth continues in Hawaii and nationally as well, higher education institutions need to adapt to the technology-oriented nature of their student body and reinvent themselves with realigned processes and practices. "In the information-based economy of the 21st century, higher education is now part of a highly competitive global marketplace" (Bishop, 2005, p. 206).

Technology and the advent of the World Wide Web (WWW) have opened up opportunities for students to participate in post-secondary education (National Postsecondary Education Cooperative [NPEC], 2004). In a study of six universities which have demonstrated expertise and leadership in distance education, Phipps &

Merisotis (2000) concluded that Internet-based distance education has become the most prevalent and the fastest growing delivery method, with its asynchronous delivery feature being considered the largest attraction. This popularity is confirmed locally with the Fall 2007 Distance Learning statistics showing 39% of the 1,212 Distance Education courses offered by MCC taken via Internet, compared to 33% using Cable TV, and 28% with Interactive Television (ITV) through Hawaii Interactive Television System (HITS) or Skybridge (MCC Institutional Research Office, 2007).

Convenience, however, cannot substitute for quality in education, so it was important to look at the effectiveness of online education in addition to its convenience. "Can online courses match traditional face-to-face (F2F) courses in academic quality and rigor? Can online courses achieve the same learning objectives as F2F courses?" (Kassop, 2003, p.1). These are the key questions to be asked of distance education. Kassop adamantly believes in the worth of online education as he states, "Not only is the answer to these questions a resounding "yes," but there are many ways that online courses may actually surpass traditional F2F classes in quality and rigor" (p. 1). Belief in these areas of excellence was key to pursuing this online pilot. It is expected that within this pilot the following areas reflect this high level of quality and rigor:

- Student-centered learning
- Geared to lifelong learning
- Enriched course materials
- Immediate feedback
- On-demand interaction & support services
- Flexibility

Defining success is the initial threshold. At times the different stakeholders have differing perceptions of what constitutes success. Phipps & Merisotis (2000) in their

Quality on the Line consolidation of important benchmarks at various institutions determined 24 benchmarks they identified as essential to quality Internet education. These benchmarks were considered in the design of this pilot program. While it is appropriate to examine carefully this new approach to presenting the content, it must also be remembered that many face-to-face classes are now utilizing similar technology to a lesser degree. The line of demarcation is becoming fuzzier with the acceptance and adoption of technology within the face-to-face environment. Still, the bottom line is education, be it distance or face-to-face, and many educational success attributes can be measured using similar tools whether the modality is face-to-face or distance based (Zhao, Lei, & Yan, 2005).

Student perception of success is also important. Studies differ on how students view computer-based learning. Whether they perceive computers as "tools for empowerment" (Thornburg, 2000, p. 9), or as less favorable than face-to-face interactions (Rodriguez, Ooms, Montanez, & Yan, 2005), it is individual. Just as courses' quality and assessment of success differs with individual instructors, student assessment of quality and success differs as well. General trends can be gathered, but no definitive answer can be provided, as each learning experience is perceived individually, based on what each student brings to the experience in the way of preconceptions, expectations, and abilities. Studying the components of satisfaction and quality of online learning experiences will assist, however, in understanding "the needs of students, support students in online courses, and promote successful learning experiences" in developing effective online learning experiences (Rodriguez, et al., 2005, p. 17).

Care must be taken in introducing new learning technologies in order to continue to support those students not willing or ready to participate (Willems, 2005). MCC has addressed this limitation by offering these same courses in multiple modes, including traditional face-to-face, innovative classroom, lab-based, as well as this online delivery.

Evaluation

Accreditation criteria are now expected to contain both quantitative and qualitative data in demonstrating student achievement. Tucker (2004) used multiple assessment strategies in comparing the effectiveness of distance education and traditional campus learning, concluding there is no significant difference in achievement. While awaiting far-ranging research results on educational technology as planned by the U.S. Department of Education (www.nationaledtechplan.org) there is value to be found in individual program evaluation (Roblyer & Knezek, 2003). It is important a new program be evaluated rather than just adopted as convenient, or easier, or as part of the latest trend.

> The professional image and educational efficacy of this field is at risk because we have collectively failed to study what we do. Practice and credibility will only improve through direct evaluation by practitioners. Anyone who practices experiential learning can and should be an evaluator of its programs. (Priest, 2001, p. 39)

Evaluation of this program is key to future offerings. One factor in this determination of course continuance is faculty and departmental acceptance of the credibility of online education (Ulmer, Watson, & Derby, 2007). MCC faculty have previously expressed mixed opinions as to the worth and validity of this online modality. As with the Ulmer, Watson, & Derby study, the differences in acceptance at MCC appear

to be closely related to whether a faculty member actually has experience with distance education. Ulmer, et al, also support the belief that some faculty members hold a preconceived idea that distance education will compromise educational quality in spite of the overall positive rating of the effectiveness of distance education. Some faculty may perceive distance education as a hindrance due to their lack of experience with the media. It further is speculated by Ulmer, et al. that experienced distance education faculty felt that their involvement with distance education denigrated them with their colleagues. Not feeling valued within the department may have affected opinions on the quality and effectiveness of distance education. Experienced distance education faculty tended to promote and recommend distance education, whereas non-experienced faculty expressed a negative viewpoint. Additionally, some academic disciplines may be more adaptable to distance education than others. Since distance education also holds advantages for faculty and institutions, cautious yet steady progress to include distance education in curriculum offerings is likely to continue (Ulmer, et al., 2007).

Local Background

The Rural Development Project (RDP) located at Maui Community College (MCC) provides workforce development training in ongoing programs on Maui as well as statewide. One such training program assisted participants to get their Associates of Arts (AA) degree in compliance with the No Child Left Behind legislation. When assessing student progress it was discovered that most of the participants did not place into college-level (any 100-level) math, and required from one to four foundational (developmental) math courses as remediation prior to qualifying for college math. How

many courses each student required depended on his or her Compass math placement exam, as well as the requirements of the specific community college (see Table 1). This was not an isolated finding. The Compass math test results at MCC from 2004-2005 showed 84% of the 2,107 new students tested were placed into foundational math courses. The following year, 83% of the 1,784 students tested in 2005-2006 also placed into foundational math courses. Only 16-17% placed into college-level math courses (Maui Community College Annual Assessment 2004-2005: The Learning Center, 2005; MCC Annual Assessment 2005-2006: TLC, 2006).

Table 1: Foundational Math Sequencing within the State of Hawaii

	Math 1B or MTHN1,2– Basic Math	Math 22– Pre-Algebra	Math 23– Practical Algebra	Math 24 – Elementary Algebra I	Math 25 – Elementary Algebra II	Math 1xx – College level math
MCC sequence	X →	X →	X →			X
All other Hawaii community college sequence	X →	X →		X →	X →	X

Further, the RDP participants had difficulty fulfilling their Quantitative or Logical Reasoning (math) degree requirement due to a combination of scheduling and fear/avoidance issues. While the fear and/or avoidance issues are not addressed by this study, scheduling issues were one of the primary needs prompting development of online math pilot courses. Confirmation of the finding of statewide interest in online delivery was shown by the registration experience for these pilot courses at MCC. These online sections were the first sections at MCC filled to capacity, beginning two months prior to

the beginning of the term, and remained filled to capacity through the end of the week five registration count period following the start of the semester, with additional unfulfilled requests for entry. While college-level courses are offered by distance-education methods, within the three years prior to this Fall 2006 pilot program, there were no distance-education offerings for foundational math courses (Math 22, 23, 24, or 25) offered within the University of Hawaii system.

The high degree of statewide interest in an online course was confirmed by conversations with the participants of the RDP program. Synchronous distance learning deliveries were an obstacle, as they conflicted with work or other non-deferrable events. Features desired by these non-traditional learners corresponded with the previously discussed advantages of CAI in math. Skybridge, HITS, and the MCC cable-television channels were determined to not be viable delivery methods, for their airtime was already filled to capacity. Delivering a class via WebCT was not considered a sustainable program due to upcoming system-wide course management software changes. CAI delivery was determined to be the most advantageous delivery method as well as providing the most sustainable program. Plato Interactive Mathematics became the program of choice as an Internet-based, asynchronous math delivery tool, commercially developed, maintained, and updated (Van Meer, 2003). In order to mitigate the identified issue of student-instructor interaction, the pilot utilized cell phone and email access, 24-hours a day, 7-days a week. Additionally, on lessons where students had difficulty, a video-streamed Internet-based library of additional help lessons was created by the instructor and made available for student use, again on a 24-7 basis.

Costs to implement the pilot were minimal. Computer access was available on MCC campus for students not having private access to a computer with Internet access. Course development was funded by a Department of Labor grant received by The Rural Development Project. Curriculum development was funded through purchase of a commercially developed product by each student. This cost included the student's purchase of the individual usage license for the Plato program, which additionally came with an online and print-media textbook. Cost was equivalent to the face-to-face classroom textbook cost.

Student Success Attributes

Factors Muse (2003) found contribute to student success or failure were:

- Computer skills
- External locus of control
- Web skills
- Study environment
- Computer confidence
- Motivation

These considerations were used to evaluate success factors in guiding participants into or away from this online modality for future offerings (Powell, Conway & Ross, 1990).

With four different delivery modalities available at MCC, how do students choose which mode is best for their personal needs? Since frequently students do not meet with a counselor as is recommended to decide, the decision is primarily left to each individual. Student considerations regarding their need for flexibility, their self-motivation, and their comfort and ability with computers need to enter into the decision considerations (Willems, 2005). However, in concurrence with Willems (2005) who asserts that clear communication of expectations is the most important factor in minimizing negative

impacts on students, several additional communication steps were required for prospective student participants. Students who were interested in this computer-based pilot were required to obtain counselor approval, through either a phone or in-person interview. The counselors communicated the additional course expectations for this pilot delivery option including self-directed learning and computer-use willingness prior to completing registration. Following the counselor interview, all students were assigned to review the informational Website (http://www.hawaiirdp.org/martyjean/) created for the purpose of assisting students in assessing whether this course delivery would be a good fit to meet their personal needs and learning styles. All students were also required to attend one of three mandatory training and orientation meetings or for those at the remote sites, to view the video recording of one of these sessions.

Application

As program developer, then instructor, and finally evaluator of this pilot program, the feedback from each of these rolls has been shared with the MCC Math Department to assist with the ongoing departmental adaptations necessary to meet student needs while maintaining educational continuity and standards. As pointed out by Heinecke, Milman, Washington, & Blasi (2001), the evaluator needs to keep their eye on “not only the technology itself, but rather some interaction of technology, context, teaching, content, and learning” (p.109). Therefore, the development and instructional components were submitted to the Math Department in February 2007 with this evaluation following in May 2008. Technology may allow teaching and learning to occur in new ways, providing alternatives for those who do not fit into the traditional education mold.

Methodology

Distance education is one means for solving accessibility issues for higher education students throughout Hawaii. To fill the void of foundational math courses available other than on-campus, daytime, face-to-face courses, one institution's solution was to develop a pilot program of computer-based distance education pre-requisite math courses. This mixed-methods research study is a program evaluation of the computer-based Math 22 – Pre Algebra and Math 23 – Practical Algebra pilot courses taught at MCC, Fall 2006.

Background Regarding These Pilot Courses

When entering a program at the community college, students enrolling at MCC are required to take the statewide math placement Compass test to determine appropriate math placement. Following registration and prior to beginning this pilot's coursework, students whose tests scores were older than one year were asked to take Compass test once again in order to have current placement information to use as a Pre-Test.

Students then began the coursework provided by Plato Interactive Mathematics computer-based instructional software. While course content was delivered via this computer-assisted instruction (CAI), in order to keep students involved, on-task, and continuing to progress, it was recognized that a level of student-instructor involvement was mandatory to maximize student success (Kitsantas & Chow, 2007; Palmer, 2005). Therefore, weekly student-teacher email communication was required from the student, and the instructor offered weekly email feedback. More frequent email or phone interaction was available according to individual student needs.

RDP developed this series of online foundational math courses, with this investigator as the course developer as well as the instructor for the pilot courses offered Fall 2006. Math 22 was offered with optional Basic math curriculum to be accessed in addition to the Math 22 curriculum by student request. Math 23 and Math 24 curriculum were determined to be so similar, that the curriculum of the two courses were merged and offered as Math 23 since that was the course offered at the MCC campus. The same course would meet the Math 24 requirements if offered statewide, due to the merging of the content. Math 25 was offered for student registration, but as it was not a requirement for MCC students, the only inquiries were from other campuses. Registration was limited to MCC students who were not required to complete Math 25, so this pilot course was dropped. Students were permitted to move at their own speed through the curriculum, with some students completing both Math 22 and Math 23 curriculum within a single semester.

Students were provided with suggested course completion timelines (see Appendix B). Lesson options included: additional Basic Math lessons, Math 22 lessons, and Math 23 lessons. Student goal choices were: Basic Math + Math 22 lessons, Math 22 lessons only, Math 23 lessons only, or Math 22 + Math 23 lessons (see Table 1). Math 25 was dropped. Lessons could be loaded on as many personal computers as the student needed, as the license was connected to an individual's log-in, thus activating the appropriate lessons and recording the usage and results. Campus computers pre-loaded for student convenience were located in The Learning Center (TLC), Laulima 108, and Ka Lama Computer Lab. In addition to the CAI-delivered content, a few lessons were

supplemented with instructor-created streaming video segments. The non-proctored evaluations of the CAI lessons made up almost one third of the final class grade. Course grade was a combination of the computer-based lesson evaluation section scores (30%), a proctored mid-term exam (30%), a proctored final exam (30%), and student participation as displayed by their weekly update communication with the instructor (10%).

Research Questions

Because this study is an evaluation, the primary purpose is to determine whether the newly implemented math project worked and how to improve it. In addition, there is a specific focus on the use of technology. Evaluation questions include:

- What aspects of technology work well and which don't work well?
- What modifications are desirable or necessary?

Although not directly part of this course evaluation, attention is also given to determining if there are identifiable student characteristics that could be used to guide future placement.

Methods

The purpose of this study is to conduct a program evaluation of the computer-based Math 22 and Math 23 pilot courses taught at Maui Community College during the Fall 2006 semester. This study is based on an evaluation framework proposed by Shadish, Cook, and Leviton (1991, as cited in Heineke, 2001). The areas they recommend examining include:

1. Social programming: Issues include program improvement, program retention.

2. Knowledge use: Issues include use of results, likelihood of result use.
3. Valuing: Issues include worth of program, justification of worth.
4. Knowledge construction: Issues include source and validity of findings, examination of oversimplification possibilities, and justification for prioritization of findings.
5. Evaluation practice: defining a feasible evaluation, worth of observations and data acquired, facilitating result usage.

In exploring these key issues, the intent is to look at multiple affective and subjective factors rather than solely relying on test scores as the primary outcome measures.

Within this framework, attention is given to the critical issues identified by Phipps & Merisotis (2000) as important in evaluating an online course.

- student demand
- student achievement
- student retention
- financial efficiency
- student satisfaction
- faculty satisfaction

Research Design

This is a mixed-methods program evaluation. Data were provided in the form of a student culminating survey, instructor compiled data from the duration of the course, and general MCC campus information. Data were collected following the completion of the course from the students, instructor, as well as campus-wide data from MCC.

Population

Students at Maui Community College (MCC) are one sub-population of the statewide population of students needing foundational math courses, Math 22 and Math

23/24 to meet degree program educational requirements. MCC students include Maui County residents who are able to be present on campus as well as remote residents from the island of Molokai, the island of Lanai, and the distant Maui community of Hana. Students required to complete foundational math courses were allowed to self-select their course delivery mode from traditional face-to-face classroom, innovative classroom, lab-based, and this computer-based pilot course. Combined class-size was capped at 30, which was over-ridden to a total of 40 plus a waiting list. Those registering for the computer-based pilot and attending, either in person or via video recording, a mandatory training and orientation meeting became the sample for this study. Students were all pre-placed into the math course based on scores from the Compass math assessment tool and then those individuals self-selected this computer-based distance education modality. Due to this self-selection process, it was expected these classes would reflect student diversity through some mixture of on-site, remote-access, traditional, and non-traditional students.

Instrumentation

The survey instrument for this program evaluation contained a total of 33 questions including demographic information as well as a combination of Likert-scaled and open-ended questions. The survey was designed by the instructor, who is also the researcher, with input from the Math Department as well as a variety of survey consultants.

The online tool chosen for this study was SurveyMonkey. This selection was based on Gaide's (2005) comparison online survey products. While tabulating responses anonymously, this tool records when a participant responds, allowing the creator to send follow-up messages to those who have not responded, thus enabling a higher return rate.

The online link to the survey was distributed to each student in the study sample via an emailed message. Results were gathered regarding student, logistical, course, and opinion information (see Table 2).

Table 2: Student Exit Survey Content

Student Information	*Logistical Information*	*Course Information*	*Opinion Information*
• age • gender • college math history • computer & online usage • job hours • family situation • math affinity	• non-completion reasons • access locations • face-to-face orientation importance	• change in math affinity • computer use • personal reactions • tools used • tool non-use reasons	• aspects liked • aspects not liked • individual's value of this delivery method • suggestions • learning experience • final expected grade

Procedures

Following completion of the final exam, students were asked to repeat the Compass test to document attainment of course content as a Post-Test, but this after-completion request could not be made mandatory. A month after the course was completed and final grades posted, the emailed request to take the survey was distributed.

Students were advised that the survey responses were anonymous, and that the survey tool recorded which students had and had not returned the survey. All students who registered for these pilot sections of Math 22 and Math 23 during Fall 2006 were part of the survey distribution, including all who dropped the course at any point after the

first orientation meeting, which occurred just prior to the first day of the semester. In order to evaluate different viewpoints, feedback was encouraged from both participants who did and those who did not complete the pilot.

To increase survey participation, three follow-up messages and one phone call requesting participation were made as necessary during a four-week result-gathering period to let each participant know their input was valued. “The recipient must have a clear understanding of why the survey is being conducted and must feel that his or her participation is essential to an outcome such as course or program improvement” (Gaide, 2005, p. 6).

Course content was assigned in accordance with Math Department content articulation requirements thus did not require comparison between delivery modalities.

Data Analysis

Survey responses were received from one or more remote-site participants, non-traditional students, and students who dropped or did not complete the course.

To confirm student success was within similar parameters, student semester grades for these computer-based courses were compared with the combined grades from all the other course delivery modalities. There was no attempt to rank course delivery methods.

Grading bias for this pilot is minimal as only 10% of the final grade had any subjective nature (student participation) while 90% of the grade was based on objective scores from the CAI lesson evaluations and proctored exams. Grading bias in the other course delivery modes for these math courses is unknown.

Statistical tabulation, frequency distribution, and coding of similar free-response results was used to analyze and evaluate the diversity and/or similarities of participants’

responses to the demographic, experiential, and evaluation areas of the survey, as well as to assess how well student needs were met. Student responses and instructor input were combined to create a list of recommendations for future course offerings and to offer input on criteria for participants.

Limitations

The survey was administered following completion of all course work and after grades were posted, thus did not influence grading in any way. Students' knowledge of their grades might have influenced the student responses positively or negatively, however having "why" responses follow preference questions attempted to minimize this possible affect.

Summary/Discussion

In December 2006 the instructor reported final course grades through Banner and in January 2007 administered the online survey. Having been granted human subjects approval (see Appendix F), this information was used to evaluate this computer-based Math 22 and Math 23 pilot program. The expectation is that the data will help determine how well these pilot courses served the needs of students, and how well the technology components worked. Based on the input of the student data and the instructor, recommendations have been made regarding future course implementations.

Results

In order to evaluate this pilot program, three components were considered; the quantitative and qualitative results from the exit survey, the quantitative results from class grades, and the qualitative input from the instructor.

Exit Survey

The exit survey was distributed to 43 students who were registered in either Math 22 or Math 23 on the first day of the semester, including students who dropped during the first week. 34 surveys (79%) were returned, however one was discarded, as the return address was not identifiable, leaving 33 survey participants. Within the survey, there were four areas of data collection:

- Student Information
- Course Information
- Logistical Information
- Opinion Information

Twenty-one students completed Math 22 while twenty-three completed Math 23. This included four students who registered for both Math 22 and Math 23, with one dropping Math 23 and the other three successfully completing both courses.

Student Information Section

Student information included age, gender, college math history, online usage, job commitment hours, family consistency, and math affinity. The class consisted of a broad mix of students. Over half the students took only one or two courses, under six credits, including these pilot math courses (see Figure 1). Over 90% of the students were female. One third of the students were 38 or older, and 60% were 30 years old or younger. While

it had been expected that the majority of students would be 24 years or older as returning, non-traditional students, in fact a high number of traditional college students also registered for the class (see Figure 2).

Although many students may have been older than the typical college freshman, three-fourths of them had taken a college class within the previous year. However, over half had taken no college math previously or it was taken six to ten years prior (see Figure 3). Almost 60% had never taken any online classes, and of those who had taken online classes, none of those classes previously taken online were math.

Almost 90% of the class also had a job commitment of sixteen or more hours in addition to going to school. Almost 30% worked a full-time 40-hour-a-week or more work schedule in addition to school. Additionally, almost 60% of the class had the additional responsibility of children, with half of these students also being single parents.

As might be expected for an online computer-based class in which students self-selected delivery mode, 90% of the students described themselves as somewhat or very comfortable with using computers. Surprisingly since these courses are computer-based, 10% described themselves as somewhat uncomfortable with computers. This was somewhat unexpected as in order to register for the class, students had to meet with a counselor to receive a course admission override, and it had been anticipated that only computer-comfortable students would choose this delivery method. During this meeting, the requirements as well as the advantages of online delivery were reviewed (see Appendix B). Students were provided with course description and course expectations. Additionally, at the mandatory training and orientation meeting each student attended, the

syllabus containing contact information, how to start and proceed, plus a suggested calendar timeline was handed out and discussed as a group (see Appendix C). Another handout given and discussed, again contained the self-assessment questions and expectations taken directly from the informational Website developed to provide information regarding this new delivery method to guide counselors and prospective students as they determined an appropriate fit (see Appendix D). Students who did not feel they met these criteria were encouraged to drop the class in favor of another delivery mode. Both the counselor and the training meeting instructor advised students to browse carefully through the informational Website (http://www.hawaiirdp.org/martyjean/) regarding this class. The Website included this self-assessment, advantages of this delivery, and a video clip plus slides of the actual program.

The class was fairly evenly divided between those who perceived themselves as 'good' or 'okay' in math (48%) and those who felt they were not good at math (52%). The division was similar between those who liked math (42%) and those who did not (58%).

Figure 1: Total Number of Semester Credits Taken (including these online math courses)

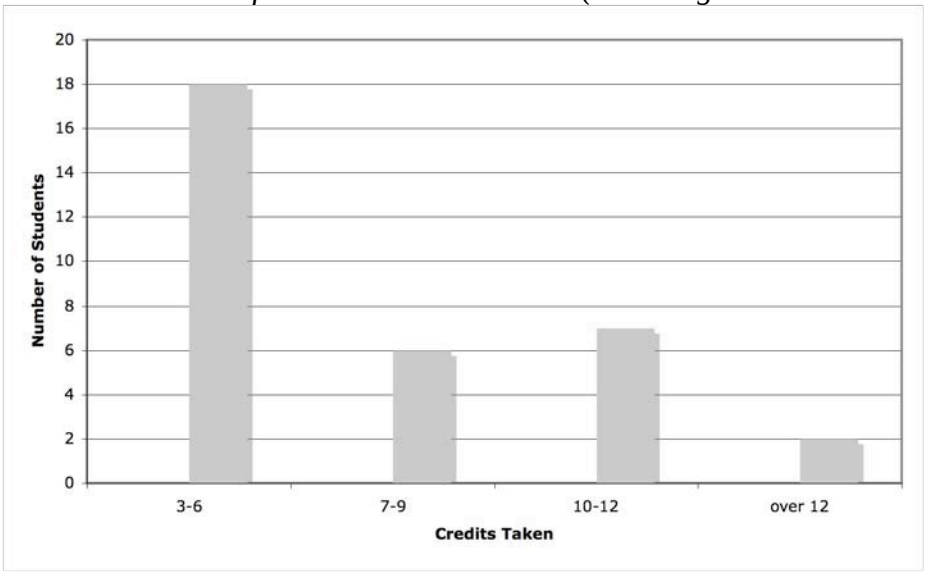


Figure 2: Student Ages in Years

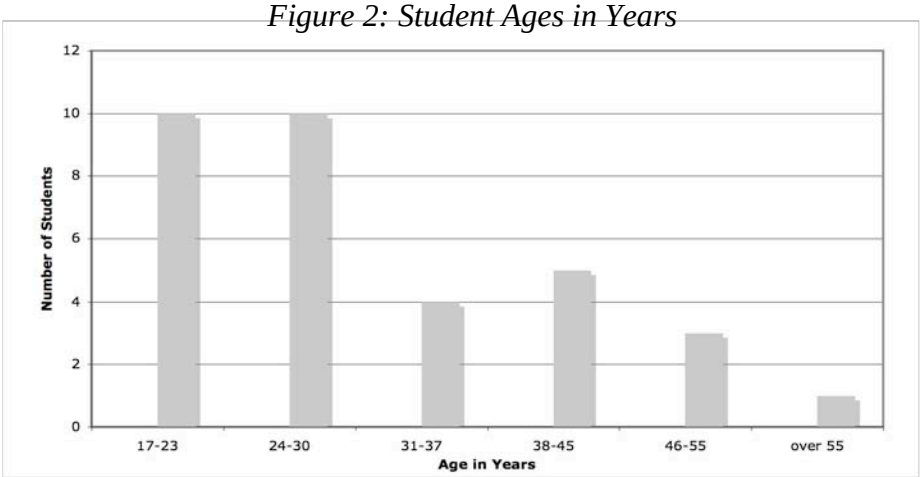
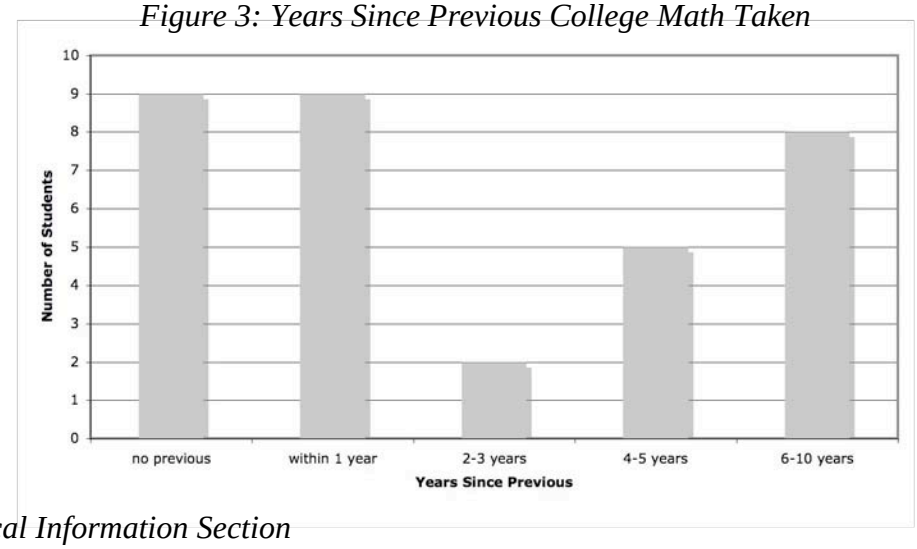


Figure 3: Years Since Previous College Math Taken



Logistical Information Section

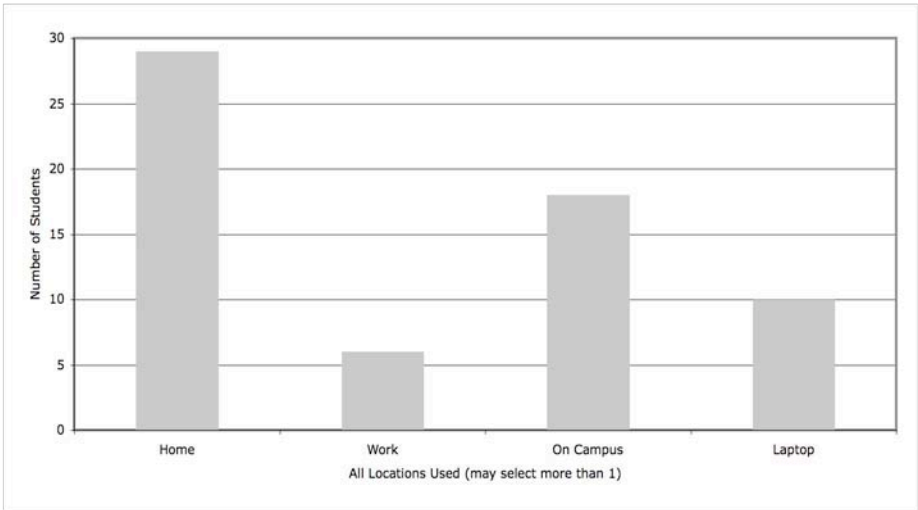
Why did these students choose this new online delivery mode instead of one of the other three delivery modes? 73% stated they chose online delivery because of time and/or location constraints. Other reasons mentioned included not wanting to feel dumb in front of peers and class availability, plus two reasons that were refuted in the orientation as fallacies: they thought it would be easier, and they thought it would save time. Those that dropped the class, received an F, or an incomplete, attributed their lack of success to

work demands, it being harder than they expected working without an in-person instructor, illness of a child, lack of responsibility, or falling behind.

Among the sites available to work on these lessons, most of the class (88%) worked on their lessons at home, with 18% accessing at work, 18% on campus at MCC, in addition to 30% having universal access via their laptop anywhere an Internet connection was available (see Figure 4). When the student was limited to choosing the site where most work was done, 75% indicated home, 3% at work, 15% on campus, and 9% at varying locations via their laptop.

It is clear from student comments throughout the survey that some students ignored or did not absorb a large portion of information presented at the training and orientation meeting. Yet almost all (91%) of those surveyed said the face-to-face orientation was somewhat or very important to success in this course, and 71% agreed it gave a clear idea of what the course would be like. Technical problems prevented students on Molokai and Lanai from live participation, but each was provided with a DVD recording of the meeting. Those remote students advised the instructor that they never watched the DVD, which explains some of the lack of understanding.

Figure 4: Program Access Locations



Course Information Section

As anticipated, getting students to begin the program lessons proved a large hurdle to overcome. In spite of detailed instructions, initial setup was very challenging for some. Using the video-streamed tutoring (at www.hawaiirdp.org for Lessons 2.1, 2.2, 2.3) and using phone tutoring was also difficult for some. 12-15% of the students rated these three technical areas combined as being difficult or very difficult. Only 9% felt actually using the program or using email was difficult or very difficult. Some students (18%) did not try to use the video-streamed tutoring lessons and about a fourth (24%) of the class did not try phone tutoring.

Student feelings about how they liked these same tools paralleled their use, however they felt slightly more positive about the tools even if they found them difficult to use. As an example, 9% found using the program modules difficult or very difficult to use, but only 3% felt somewhat or very negative about using these modules. Almost 80% of the class had no technical problems or very minor problems that were resolved easily, like inserting the wrong CD, Internet connectivity, or a technical support easy-answer question. There was another 6% who had major computer issues impacting their success in the course, but these issues were beyond the scope of the instructor or Plato technical support. This included computer virus issues, computer crashes, and software conflicts. 15% felt they had major issues that were not resolved, such as inability to connect from home and inability to view streamed videos (see Figure 5).

There were a number of tools available for students use. Understanding which tools were used and why other tools were not used helps define what to include in the future.

About half of the students used the online note taking journal and the online textbook. 12% did not use their hard copy textbook, and surprisingly, 6% did not use either textbook. Other tools not used include the recommended calendar timeline (15% did not use), video-streamed tutoring tool (39% responded they did not use this tool in apparent conflict with a previous use question where only18% responded that they did not use the video-streamed tutoring), phone (42% did not use it to contact instructor), and 3% did not use email to contact the instructor (see Figure 6). Reasons given for non-use included not feeling it was needed, the online tool didn't work consistently, preference for paper tool over online tool, computer difficulties using the tool, did not know how, and never got around to it. All respondents except one felt email was helpful and effective for them. The one person who did not agree stated they received an error message when emailing the instructor. Unfortunately this person did not call or otherwise notify the instructor so that the problem could be addressed (see Figure 7).

Figure 5: Technical Problems

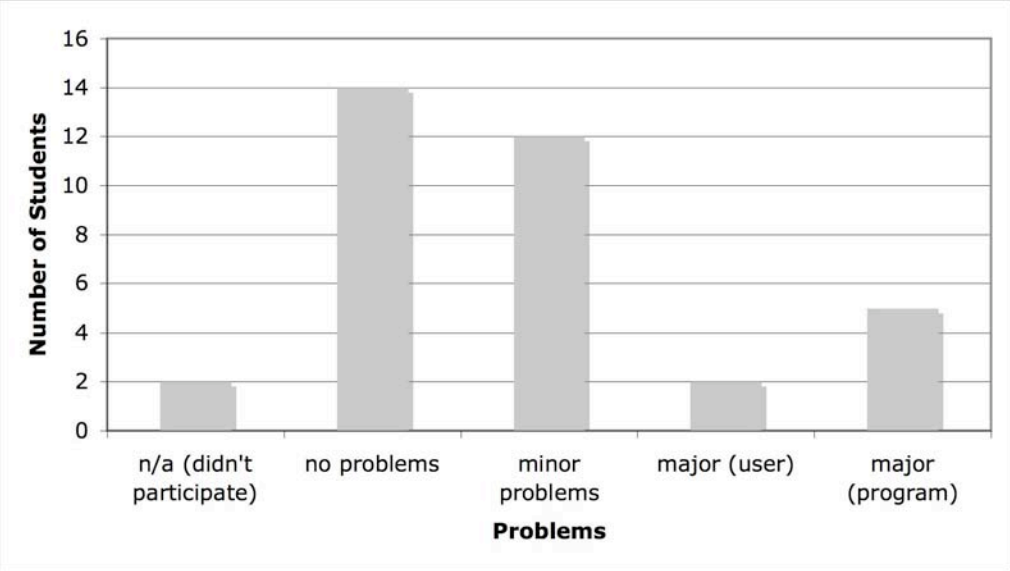


Figure 6: Course Tools Used and Not Used

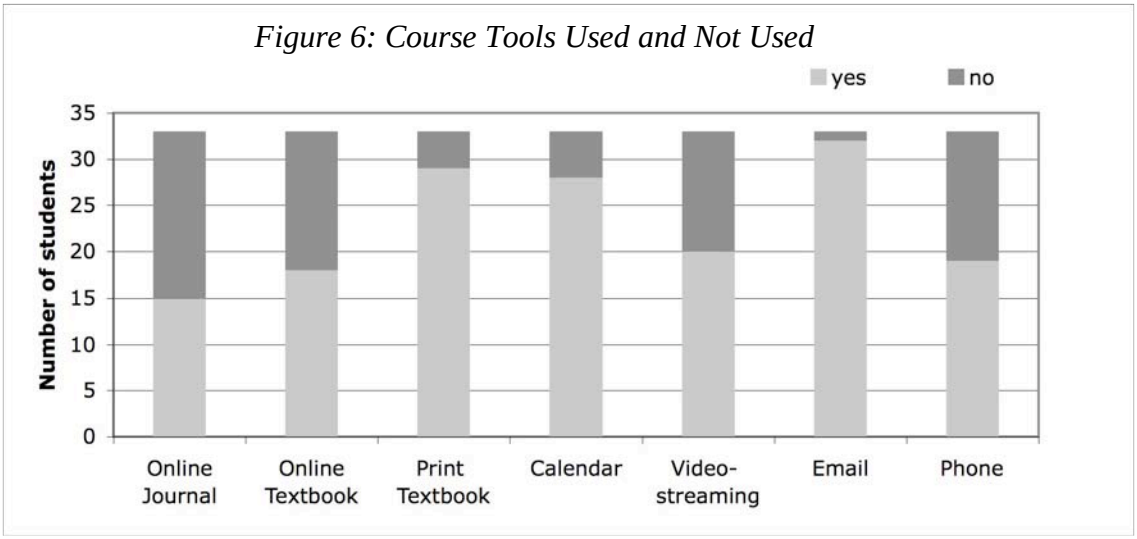
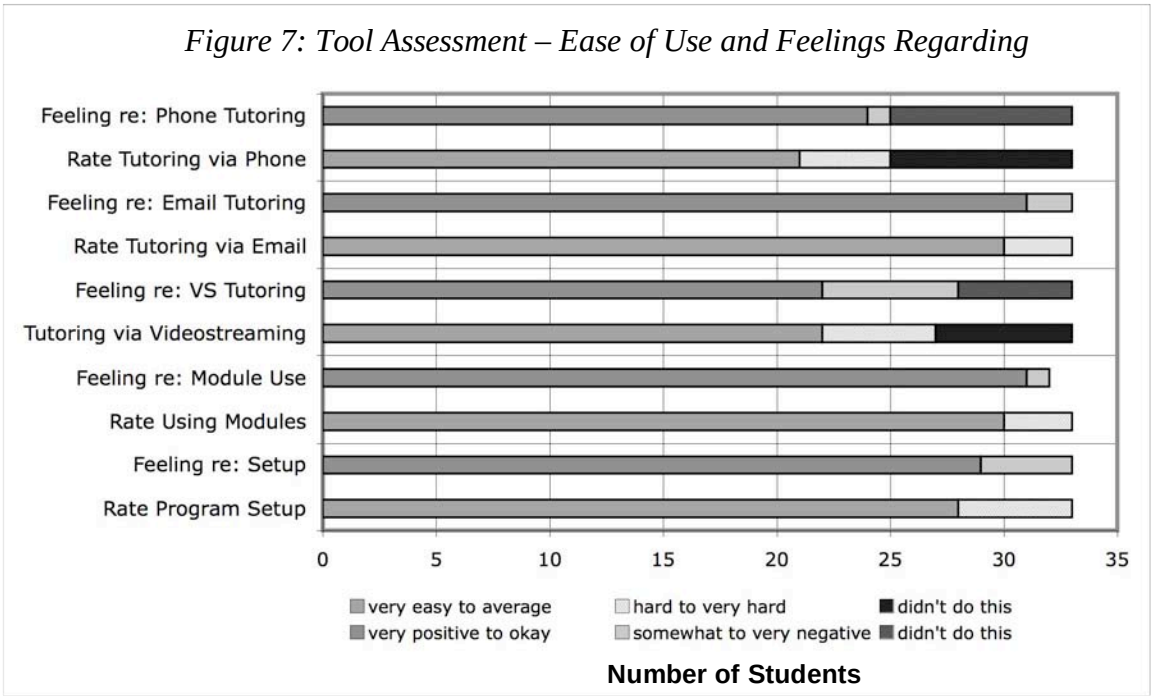


Figure 7: Tool Assessment – Ease of Use and Feelings Regarding



Attitudinal Information Section

Attitudes Towards Math

The majority (61%) of the participants surveyed remained unchanged regarding their affinity for math following this class. 12% found that they preferred face-to-face instruction better, however 27% found they liked math better using this online program

over the traditional face-to-face delivery. The class was split whether they would have chosen this class if they knew at the beginning what they knew by the end, with two thirds feeling they would have still taken it while one third would have not taken it. Suggestions to improve the class predominantly centered around improving the technical issues regarding accessing the program and/or the separate online testing program.

Positive and Negative Reactions

What was liked most about the class was predominately (75%) about personal preferences rather than the program itself, with almost all including reference to anywhere/anytime convenience or self-paced design. Multi-sensory presentation and interactive nature with good explanations were the product features most liked. About the same quantity of comments were shared for the negative aspects of the class, however there was little agreement on what the negative issues were. Comments were equally divided between personal preferences and product issues (see Figure 8). The most disliked feature was not having an in-person instructor for asking questions. Suggestions for improvement of the class predominantly centered around improving the technical issues regarding access of the program and/or the supplemental online testing program (see Figure 9).

Learning Experience

In evaluating the learning experience, over three-fourths of the respondents felt they learned more than they expected to (see Figure 10). Under 10% felt the method didn't make a difference one way or the other, while 14% felt they learned less. A few felt strongly that they learned more in this online class using Plato Interactive Mathematics

than in a traditional face-to-face class, and about the same number felt exactly the opposite. Many of the respondents liked the delivery method, while the same few individuals who preferred the face-to-face mode better were also the ones who did not like this delivery method.

Instructor Assessment

The majority of the class (83%) found the instructor helpful, with the balance feeling the instructor was not an influence in the class at all (6%), or was not helpful enough (11%). Half of the survey participants added instructor comments that ranged from “no problem with instructor,” “helpful,” “very available,” to “great,” and stating that the instructor was not a factor in their perception of any difficulties with this class. The one criticism was the instructor did not know the technical information, which was addressed in the syllabus as handled by the Plato technical support department. 94% responded that the decision to take another Plato-based math class would not be influenced by having a different instructor either. One student’s response summarized what should always be the classroom experience: “The instructor was good; I expect all to be good.”

Overall Assessment

The student comments shared reflected one student’s assessment, “This method is certainly not for everyone.” Overall, they stated they liked the tool, liked the freedom, but had trouble with self-discipline, were upset by the technical issues, and didn’t like having to go to campus for the proctored exams. Most shared positive reactions, such as “this should be offered all the time,” “add more math levels,” and “it’s a great learning tool.”

Figure 8: Positive Assessments Regarding Participant Needs & Program

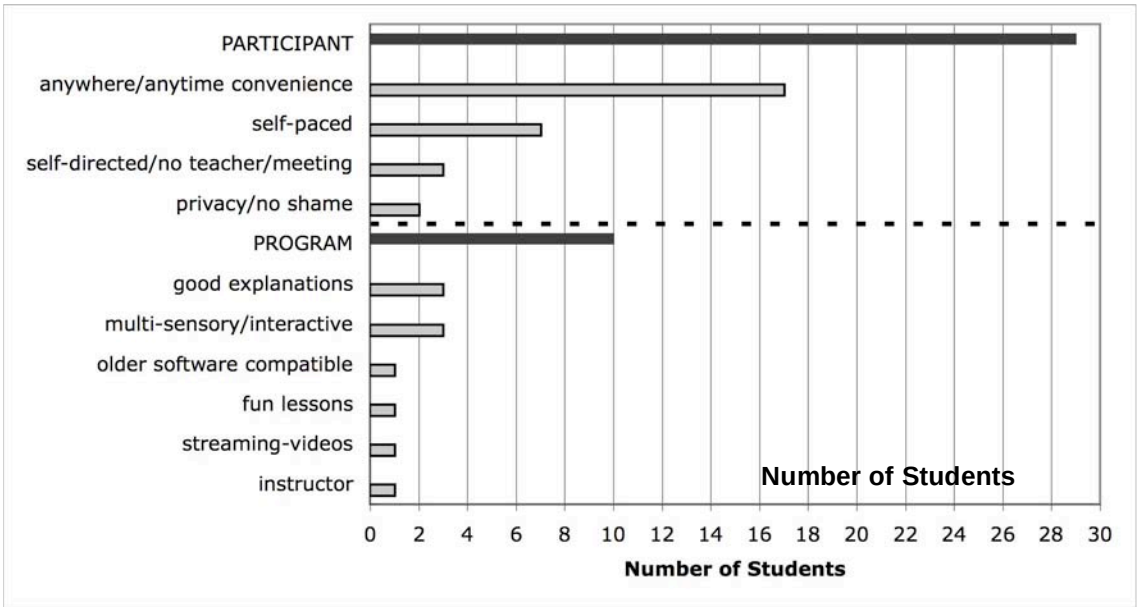


Figure 9: Negative Assessments Regarding Participant Needs & Program

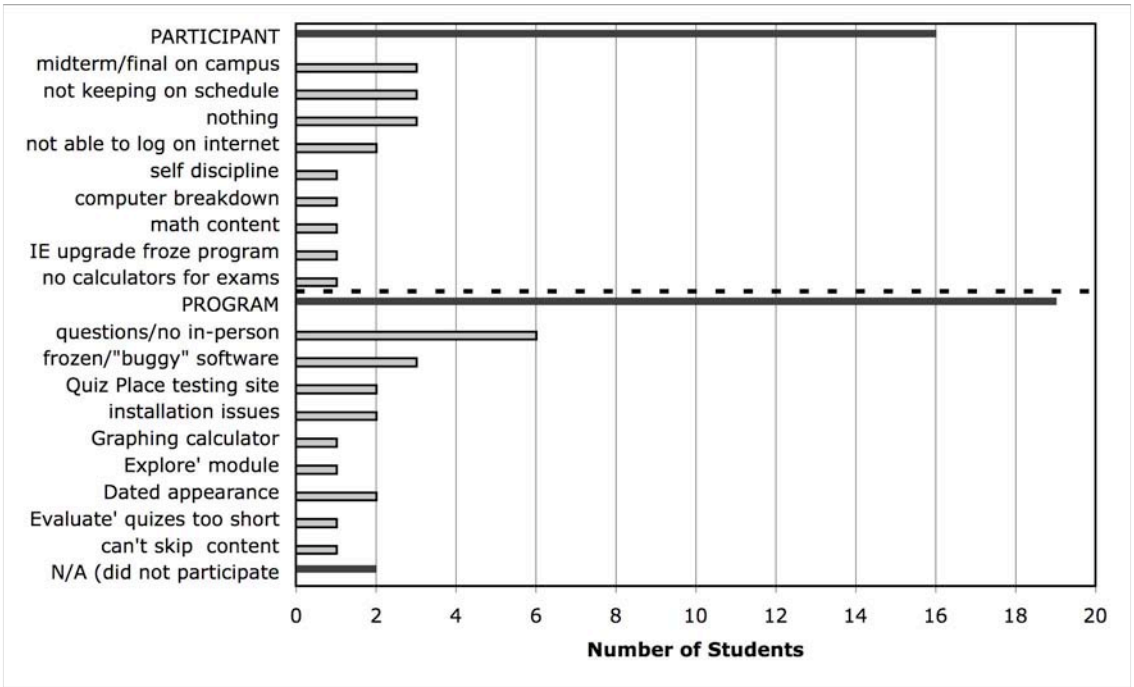
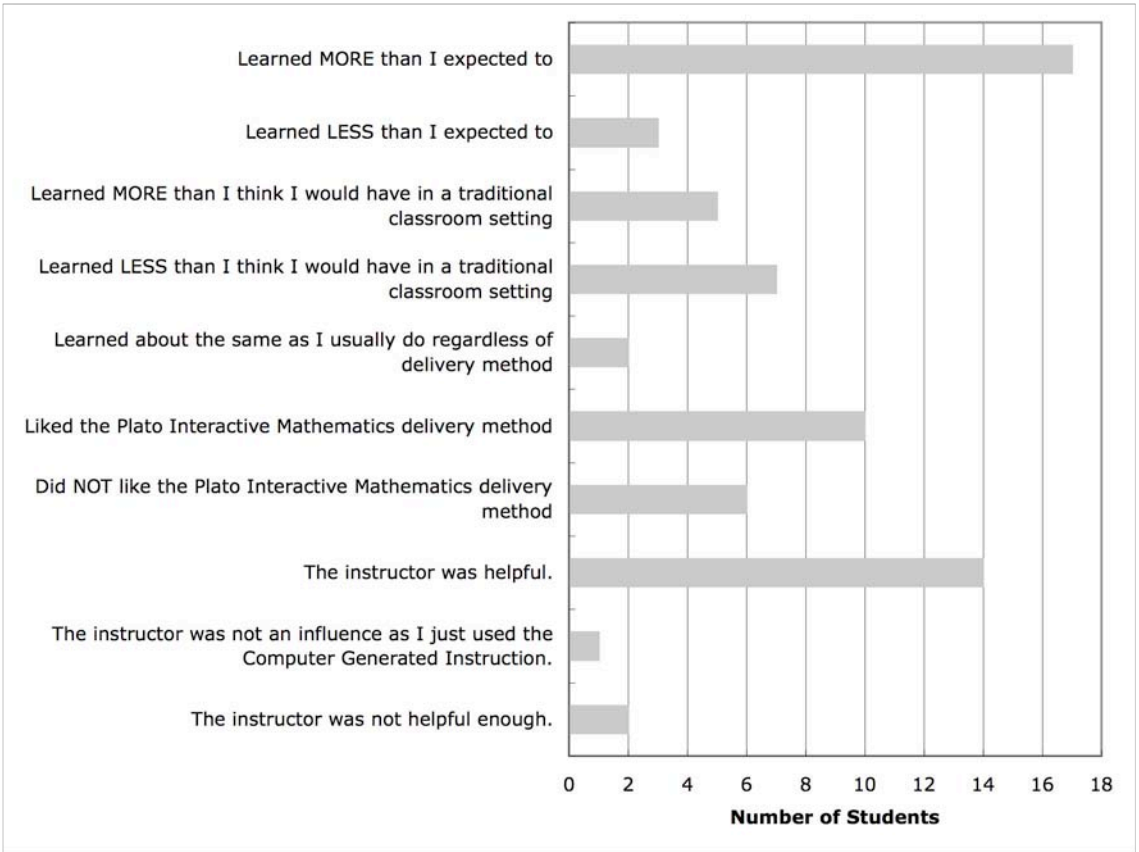


Figure 10: Learning Experience Evaluation



Final Grades

The lowest level of math is Basic Math. This would include the four mathematical operations of addition, subtractions, multiplication, and division, as well as signed numbers, fractions, and percent. Math 22, Pre Algebra, reviews all of this except the four basic mathematical operations before going into beginning algebra with some elementary geometry concepts. Math 23, Practical Algebra, reviews signed numbers and much of the beginning algebra content before moving into more advanced concepts including inequalities, graphing, factoring, and quadratic equations (see Appendix E). When students first enter MCC, in order to place students into appropriate math level courses, students take the Compass placement exam. This could have been many months or years

prior to these courses. For this pilot, students were asked to take the Compass test again during the first week of class and again at the conclusion of the class, but only a few did so. It was therefore not possible to see if at the completion of the course taken they demonstrated their learning by placing into the next level through exam placement.

Nine of the students who were placed into Math 22 actually Compass-tested into Basic Math. They were given over-rides to take Math 22. Five of these dropped the class, and the other four passed with one B, two Cs, and one D. A student who Compass-tested into Math 22 was given an over-ride to take Math 23 and passed with a C. Another student without any placement information at all was placed into Math 23 and received an F. Overall, the passing rate of students in these new online delivery classes was very similar to the combined rates for the other three delivery modes. This study was not designed to compare the delivery methods looking for the most "successful." It is questionable whether such a determination can be made, since it is clear from this study as well as others, that a method that is very suitable for one student is equally un-suitable for another. The intent in looking at final grades is as a control for instructor difference, verifying this instructor's grading gave results in the same range for these courses when compared to the average of all the other modalities. Indeed, the passing rates are very similar for both Math 22 and Math 23 (see Table 3).

Table 3: Plato Math Pilot Grade Comparison to All Other Math Deliveries Combined (Innovative Classroom, Lab-based, & Traditional Face-to-Face)

Math 22						
Maui Grades:	**Plato**	**%**		**Others**	**%**	
A	2	7%		28	18%	
B	4	15%		28	18%	
C & I-C	7	26%	**Total passed**	26	17%	**Total passed**
D & I-D	3	11%	**59%**	6	4%	**56%**
F & I-F	5	19%		28	18%	
W	5	19%		20	13%	
drop	1	4%		21	13%	
	27	100%		157	100%	

Math 23						
Maui Grades:	**Plato**	**%**		**Others**	**%**	
A	2	11%		19	15%	
B	6	32%		22	17%	
C & I-C	3	16%	**Total passed**	18	14%	**Total passed**
D & I-D	1	5%	**63%**	9	7%	**52%**
F & I-F	2	11%		34	26%	
W	2	11%		20	15%	
drop	3	16%		8	6%	
Total at end	19	100%		130	100%	

Findings, Conclusions and Implications

The instigating issue that brought about the development of this online math remediation program was accessibility for non-traditional students. Before deciding the success of this program, it is appropriate to compare the motivation of those original students to these participating students. The data shows clearly that this sample population is also non-traditional as defined by Bichelmeyer & Molenda (2006), with 70% being older than traditional college students, 88% working sixteen or more hours weekly with almost 30% working full time, and almost 60% being single parents. The motivation for these participants is also similar, with 73% choosing this modality because of time and/or location constraints, or in other words, accessibility.

The high rate of survey participation (79%) is attributable to the students' belief that their opinions would be important in determining the continuance of these online classes as predicted by Gaide (2005). The students were advised at the outset of the class that they would be asked for their input, and the survey plus follow-up phone conversations reiterated this same message.

What Worked

As anticipated, those highly motivated, self-disciplined students found the benefits of this program met their needs well. Three were able to save a semester of time by completing both courses compressed into one semester. Students found the flexibility of accessing the lessons at a variety of locations met the needs of their busy and varied lives. The additional bonus of using the same book and software for both classes was a further

savings. The ability to 'test out' of lessons allowed students to spend their time more efficiently on the content that was new or difficult for them. The multi-sensory approach of CAI worked well for many students, duplicating the findings of Aivazidis, Lazaridou, & Hellden (2006) and Kulik & Kulik (1991). They could hear, see, and manipulate the content facilitating learning and retention. Reviewing lessons or parts of lessons allowed their lesson quizzes (the 'Evaluate' module) to be improved with retakes. Removing the stigmatic component of peer-pressure was an asset for some students.

For those who met the entry criteria of self-discipline and comfort with computer use, this was a helpful and efficient modality as predicted by Muse (2003).

What Didn't Work

Software Issues

Technology difficulties were the biggest problems. Internet Explorer issued an update during the semester that would not run this program's software. Several students upgraded before the incompatibility was understood, causing many hours of frustration and difficulty in resolving. A patch to fix the problem was not available until following the completion of the course. There were also a number of small issues contributing to the impression that the software was "buggy." This was not a surprise finding, as Plato was due to rollout a major update for Fall 2007, within a few months of this program's completion. The new version is expected to eliminate many, if not all, of these complaints as it will migrate from lessons run on disks loaded on local computers to a Web-based delivery allowing broader computer access. Older computers, as well as those using Macintosh and Linux operating systems will then have equal program access. An

integrated testing program is also due to be incorporated with the new rollout, thus eliminating the problematic Test-Check software supplied by a third-party vendor.

Personal Technology Issues

Some issues with technology were on the participants' side, not on the program's side. Internet connectivity, other software incompatibilities, and computer virus attacks could still continue to be issues, as with any use of Internet/computer-based learning. Any modality has "blockers" that could interfere with accessing learning, so while it is necessary to work on minimizing the impact, it is doubtful that it will totally be resolved.

Communication Issues

Communication of expectations is another area that still could use improvement. Although key information was published in the course descriptions, in the syllabus, on the informational Website, emailed directly to each student, and discussed in the face-to-face meeting, comments from the survey indicate critical information necessary for successful completion was not comprehended. This is an ongoing issue in many face-to-face classes as well. While concurring with Willems (2005) regarding the importance of clear communication of expectations for student success, it was found to be difficult to insure those expectations were actually heard, understood and believed in spite of student assurance that they understood.

Best Fit

Finding the best fit for students with regard to the choice of learning modality seemed to be a key component in this pilot. For students who accurately self-analyzed themselves as having the self-motivation to self-schedule the time necessary and who

possessed a willingness to use computer-based technology, the course was successful. For those who thought it would be "easier" than other delivery modalities despite what they were told at the orientation and training meeting, and those who lacked the self-discipline to set their own "class time," they found this course frustrating and disappointing. While this is not surprising, it does reflect that better screening and matching of learning modalities to student needs would be of benefit. Where and how does this screening take place? Counselors were one intervention, the Website was another, and the orientation and training meeting was a third. Development of an online pre-screening tool might help identify which modality might be a student's best fit. Many schools offer such a tool, however it is still up to the student whether to heed the advice supplied. At some point the participants need to accept their own responsibility for listening to the advice and instructions already provided. At the community college level these are adult participants and while guidance is needed to make informed choices to maximize their learning success and receive the most educational value for their money, they are entitled to explore options they deem worthwhile even if it is not in their customary comfort zone. Making the selection of modalities based only on the criteria of convenience, however, is clearly not enough to insure success.

Tools

Choice of tools used by each student differed substantially. The choices made also appear to have influenced the success of the student. It is not difficult to understand that the students who used neither the online or hardcopy textbook did not fare as well as those who did, if for no other reason than the additional media would help retention. Use

of one of the textbooks would be mandatory for optimal success. Another mandatory tool would be the course calendar found as part of the syllabus. Keeping up with or going faster than the calendar minimum requirements would ensure completion of all content. Emailed weekly contact from each student was a requirement to keep communication open as well as being a reminder to stay on task as recommended by Kitsantas & Chow (2007) and Palmer (2005). . This should remain a requirement, and in fact be broadened by the addition of required specific content sections to include:

- Lessons covered this week (allows comparison to calendar for appropriate pacing)
- What concept was easiest (student can articulate what was done)
- What concept was most difficult and what was difficult/confusing about it (student is aware of what they may need to review at a later time)
- What help the student would like and suggestions as to when/how to accomplish this help (advising instructor of how to provide tutoring or other assistance in a way most helpful for the individual)
- Personal input (information that might be pertinent for the instructor, such as a trip without connectivity, an illness, loss of Internet at home, computer issues, etc)

Some students were reticent to contact the instructor for assistance, yet the survey showed they want an amount of interaction, and indeed this communication is beneficial for creating the teamwork and rapport necessary for optimal learning.

The online journal was an optional tool in lieu of a handwritten journal that would allow access to notes wherever and whenever the student accessed their lessons. This access advantage plus allowing printing for hard-copy reference was over-weighed by technical problems that deleted entries unpredictably, losing student notes. This issue should be rectified with the new rollout of the Plato product.

Other optional tools, intended to be used as needed, included video-streamed tutorials on lessons needing additional help, plus email and phone tutoring. These video lessons walked through homework problems, so although each lesson was approximately an hour long, the student could watch part or skip sections, avoiding the need to view it in its entirety. Other synchronous tools such as Skype and Elluminate should be considered for tutoring with any future online iteration. Some students were content to skip difficult concepts or get just the general idea rather than using the optional tools and aiming for mastery. While providing these tools for students who need them is necessary, it will always be up to the individual student to utilize the tools when needed.

Recommendations

Another trial using the updated Plato Web-based software could offer a comparison to see if all technology issues have been successfully addressed or whether another product should be considered, as this was the biggest drawback for these online courses. Creation of a computer lab having the ability for two-way synchronous teleconferencing via Polycom, Skybridge, or Hawaii Interactive Television System (HITS) would be an asset for including in the orientation and training session the remote sites such as Hana and Lahaina on the island of Maui, plus Lanai and Molokai that are MCC's non-Maui

island sites, and for future offerings statewide or beyond. This could also be used for tutoring sessions if desired. Since the students on Lanai and Molokai could not participate in the live face-to-face meeting, it started them with a disadvantage that was not overcome.

Saying "no" to a student is not an easy thing for a teacher as their focus is to be encouraging to students. However, in particular for this self-directed, less instructor-controlled learning situation, saying "yes" may actually do the student a disservice. If a student does not meet the criteria for registration, including following the registration timeline, getting the registration over-ride by meeting with a counselor, purchasing their book/software license in a timely manner, logging-in by the assigned date, etc., then that student will probably not have the skills to be successful with this delivery style. If they do not follow instructions to get into the class, they most likely won't follow them during the class either. Being more rigid in following registration guidelines may therefore be a good screening tool.

For the Future

Although students were encouraged at the orientation and training meeting to exchange contact information in order to have potential "study buddies," few students did this. While not wanting to add additional work and burden for the students, an optional weekly chat-room or discussion board posting might facilitate this connectivity. This aspect needs to be explored further as studies show positive effects from support groups.

Not using the 'Explore' module could be considered. It is supposed to provide real-world application for concepts within that lesson. While it might be "required," it

could be eliminated as tested material within the ‘Evaluate’ module. As the original students stimulating the pilot creation were educators, the real-world context was important for their understanding. It could be argued both for and against usage in a randomly mixed group. Future instructors can evaluate whether they feel the additional time is best spent on the ‘Explore’ module or by using other tools.

Some students wished for this modality to be extended to higher math levels as well. Whether this would work as well in the more advanced math concepts would be a source of further study. Whether these current foundational courses meet content and learning rigor has not yet been totally answered. The next step would be following these same students into their next math course to see if they did learn and retain the content from these pilot courses, especially in comparison to students from other learning modalities.

The somewhat higher grades might reflect instructor grading-bias, or might be due to the screening process as might the lower withdrawal rate. Some of the ‘F’ grades were not due to failure to learn, but were from students who neither participated in the course nor withdrew. As they didn’t participate in the course, had they withdrawn, the passing rate would be even higher perhaps becoming significantly higher than the other modalities, and the withdrawal rate might have moved up to approach the average of the other modalities (see Table 3). To determine if the grades actually reflect the learning, additional comparison studies by follow up in subsequent courses would need to be evaluated as mentioned above.

Even more compelling for further study is exploring why we have such demand for these foundational courses. The paradox must be resolved where students are promoted

through high school and graduation as having met expectations, yet they cannot successfully demonstrate pre-college mastery of math. This disconnect within the K-15 educational system is letting these students down, and a solution must be found. Further analysis of where and how this is happening will help fill this knowledge gap, and thus reduce the current excessively large need for remediation.

Epilogue

What decision has been made at MCC regarding online delivery of foundational math courses? Students and math faculty have been satisfied with the results Phipps & Merisotis (2000) recommended be considered. These online courses are continuing to be offered, with local demand as well as need continuing to rise as noted in the MCC campus Compass placement test results and also reflected statewide through the QMark study and Holden & Westfall (2006). As of Fall 2007, another delivery product is being used instead of Plato. Whether it meets the educational needs of the students is fuel for yet another study.

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Plato Online Mathematics Course Evaluation

Survey Introduction

Thank you for being part of the first classes at MCC taking Math 22 and Math 23 using a completely online delivery! Even if you dropped this class or did not complete the whole course, your answers are requested. Your responses in the following survey will help in determining whether or not this has been an effective learning tool. It will also help deciding whether or not to continue providing this method of content delivery. Therefore, in addition to the usual course evaluation questions there will be some additional questions regarding you, the student.

Responses arrive anonymously – I WILL NOT know who the answers came from. I WILL know if you replied (using your hawaii.edu email address) or not. No right or wrong answers (yay!) but I ask you to please give honest and complete answers. The more you share, the more an accurate assessment can be made.

As a reminder, if you have not yet done so, please retake the Math Compass test (take the Algebra test) at the TLC as soon as possible. (Compass Testing will be available again starting February 5.) You can leave the green results sheet with the Proctor to be put into my folder. (The sooner you do it, the less chance you'll forget what you have learned!) The Compass Test will NOT be available between January 21 and February 4.

Thank you for your hard work this semester! I have enjoyed the process, as well as getting to know you through your weekly comments.

Wishing you the best in your new classes.

Part 1: About the Student

Learning about who chose to take this class totally online using this new delivery method, Plato Interactive Mathematics.

1. How many college credits INCLUDING the Plato math class(es) did you take during Fall 06 semester?
    a. 3 - 6 credits
    b. 7 - 9 credits
    c. 10 -12 credits
    d. more than 12 credits

2. Your gender is:
    a. Male
    b. Female

3. Your age is:
    a. 17 or younger
    b. 18 – 23
    c. 24 – 30
    d. 31 – 37
    e. 38 – 45
    f. 46 – 55
    g. Older than 55

4. When was your last college class of any kind prior to taking this math course?
    a. This was my first semester taking college courses
    b. Between Aug 05 and July 06 (within the past year)
    c. Between Aug 03 and July 05 (2 – 3 years ago)
    d. Between Aug 01 and July 03 (4 – 5 years ago)
    e. Between Aug 96 and July 01 (6 – 10 years ago)
    f. Before Aug 96 (more than 10 years ago)

5. How long ago was the last math class you took prior to the Plato course(s) you took Fall 06?
    a. Between Aug 05 and July 06 (within the past year)
    b. Between Aug 03 and July 05 (2 – 3 years ago)
    c. Between Aug 01 and July 03 (4 – 5 years ago)
    d. Between Aug 96 and July 01 (6 – 10 years ago)
    e. Before Aug 96 (more than 10 years ago)

6. Have you ever taken an online class (computer-assisted instruction, WebCT, etc) prior to taking this Plato Interactive Math class?
    a. Yes
    b. No
    c. If yes, what did you take? *(free write)*

7. How many online classes have you taken?
    a. This was my first
    b. 1 before this one
    c. 2 before this one
    d. 3 or more before this one

8. Employment:
   How many hours a week did you work during Fall 06 semester while taking this Plato class?
    a. 0 hours per week , not employed
    b. 1-10 hours per week
    c. 11-15 hours per week
    d. 16-20 hours per week
    e. 21-30 hours per week
    f. 31-40 hours per week
    g. More than 40 hours per week

9. Family:
   Who do you live with?
    a. Single – live alone, with room mate, or with parents
    b. Single – live with children your are responsible for
    c. Single – live with another adult and children you are responsible for
    d. Married – live with spouse
    e. Married – live with spouse and children

10. Rate yourself regarding your comfort using a computer. Include: loading new software, working with tech support by phone or email to fix problems, using & checking email regularly, and learning a new software program.
    a. Very comfortable
    b. Somewhat comfortable
    c. Somewhat Uncomfortable
    d. Very Uncomfortable
    e. Do you feel differently about it now that you have taken this class using Plato? *(free write)*

11. PRIOR to taking this class, how would you describe your math ability?
    a. Okay or good at math
    b. NOT good at math

12. PRIOR to taking this class, did you enjoy math?
    a. I LIKED math
    b. I DID NOT like math

13. Why did you choose this delivery method, since the same course was also available in other formats? (lab, traditional classroom, etc) *(free write)*

Part 2: Taking the Class

Learning about how you chose to progress through this class, since you were able to make most of the choices.

14. What math course(s) did you take this semester using the Plato Interactive Mathematics online course deliver? (check both if you took both)
    a. Math 22
    b. Math 23

15. If you dropped this class, received an Incomplete, received a NC, or received an F grade, explain what you believe are the reasons why.
    a. Does not apply to me. I received/will receive a passing grade of D or better.
    b. Why? *(free write)*

16. What locations did you use at any time during the semester to work on lessons? (NOT including the mandatory testing done at TLC)
    Choose as many as apply to you.
    a. Home
    b. Work
    c. TLC
    d. Ka'Lama Computer Lab
    e. Laptop – universal access
    f. Other (please specify) *(free write*

17. At what location did you do MOST of your online work for this course? (NOT including the mandatory testing at TLC)
    Choose one.
    a. Home
    b. Work
    c. TLC
    d. Ka'Lama Computer Lab
    e. Laptop – universal access
    f. Other (please specify) *(free write)*

18. How helpful and important was the face-to-face orientation and training meeting?
    Choose all that apply.
    a. Very important
    b. Somewhat important
    c. Not important
    d. It gave me a clear idea of what the course would be like
    e. It did not give me enough information to decide whether to continue with the course or not
    f. It should be mandatory
    g. It should NOT be mandatory
    h. I wish it had (or had not) included (please be specific): *(free write)*

19. Now that you have completed this online interactive math class, have you changed your opinion about math?
    Choose one.
    a. No change – I still like math
    b. No change – I still DO NOT like math
    c. Yes, I changed my mind – I like doing math using the Plato system BETTER than the more traditional math methods
    d. Yes, I changed my mind – I like the traditional math methods but DO NOT like math using the Plato system as well.

20. Rate how easy or hard you felt the following were:
    (very easy, easy, average, difficult, very difficult , N/A – didn't do this)
    a. Setting up and logging into the Plato software program
    b. Using the Plato Modules (Overview, Explain, Apply, Explore, Evaluate)
    c. Using the streaming video tutoring (for lessons 2.1, 2.2, and 2.3)
    d. Using email to ask teacher questions/receive teacher's notices
    e. Using phone (via teacher's cell) to ask questions

21. What is your personal feeling about the following?
(very positive, somewhat positive, okay, somewhat negative, very negative, N/A – didn't' use this)
    a. Setting up and logging into the Plato software program
    b. Using the Plato Modules (Overview, Explain, Apply, Explore, Evaluate)
    c. Using the streaming video tutoring (for lessons 2.1, 2.2, and 2.3)
    d. Using email to ask teacher questions/receive teacher's notices
    e. Using phone (via teacher's cell) to ask questions

22. Did you use the optional tools provided?
(yes or no)
    a. Online note taking journal
    b. Online textbook
    c. Hardcopy textbook
    d. Suggested lesson calendar schedule
    e. Video streaming tutoring (lessons 2.1, 2.2, & 2.3)
    f. Email to instructor
    g. Phone call to instructor

23. For any optional items you did NOT use (from precious question), what was the reason you DID NOT se them? *(free write)*

24. How much contact (email or phone) after the initial training meeting would you say you had with the instructor? Were those interactions helpful?
Choose 2 answers plus write your comment in the text box.

    a. None
    b. A little
    c. A moderate amount
    d. A lot
    e. This was too little for me
    f. This was just right for me
    g. This was too much for me
    h. Were these interactions helpful? *(free write)*

25. Did you have technical (installing, connecting, logging in) issues?
What were they?
How did you resolve them?
(free write)

Part 3: Your Opinions

Your opinions matter! Please be HONEST and COMPLETE in your answers. They will be used to evaluate whether to continue using this delivery method.

26. What did you especially LIKE about this course? *(free write)*

27. What did you especially DISLIKE about this(ese) course(s)? *(free write)*

28. Knowing what you know now about how this math delivery works, would you still choose to take the math class using the online Plato delivery?
    a. Yes
    b. No
    c. WHY? *(free write)*

29. What suggestions would you make to improve this class? *(free write)*

30. In your opinion, evaluate your learning experience.
    Choose as many as apply.
    a. Learned MORE than I expected to.
    b. Learned LESS than I expected to.
    c. Learned MORE than I think I would have in a traditional classroom setting.
    d. Learned LESS than I think I would have in a traditional classroom setting.
    e. Learned about the same as I usually do, regardless of the delivery method.
    f. Liked the Plato Interactive Mathematics delivery method.
    g. Did NOT like the Plato Interactive Mathematics delivery method.
    h. The instructor was helpful.
    i. The instructor was not an influence as I just used the computer-assisted instruction.
    j. The instructor was not helpful enough.
    k. Other opinions: *(free write)*

31. What grade did you receive for this class?
    If you received an Incomplete, what grade do you anticipate you will receive when you have finished completing your work?
    a. A
    b. B
    c. C
    d. D
    e. F

32. Would your decision to take another Plato-based math class be influenced (positively or negatively) if a different instructor taught it?
Explain how the instructor affects your overall opinion of this class.
    a. Yes
    b. No
    c. Explain: *(free write)*

33. Anything else you'd like to add to help in the determination whether this Plato computer-assisted instruction has been a good learning tool? *(free write)*

Computer-based Interactive Mathematics for Fall 06
(Math 22, 23)

Requirements to participate would be:

- Placement into foundation math *(basic*?, 22, 23, 25)
- A personal email address (hawaii.edu is ok) & willingness to monitor it daily/several times a week
- Home computer with internet access or other computer access of a minimum of 7 hours/week
- If the computer to be used is a Macintosh, student must purchase the additional program Virtual PC with Windows to participate (approximately $200)
- Strongly self-motivated, as the class time is self-scheduled.
- Willingness to use computer-based technology.
- Permission for RDP to review student's college records (Compass placement, math courses/grades)
- Mandatory training and orientation 1st class session, to be held on each island (schedule to be announced)
- Proctored mid-term and final exams
- Completion Compass placement score (retaking the Compass when requested by instructor at end of the semester)
- Textbook(s)/software or up to $100 of cost for multiple texts/software

Computer requirements:

- Microsoft compatible sound card, headset, 56K modem or faster internet connection (& Internet Service Provider), Internet Explorer 5.5 or later OR Netscape 5.2 or later, mouse, keyboard, monitor
- Cookies must be **enabled** and pop-up blockers must be turned **off**.
- **Windows 98, Windows ME:** 300MHz or faster processor speed, 128MB or more memory
- **Windows XP Professional, Windows XP Home Edition, Windows 2000 Professional with SP4:** 500MHz or faster processor speed, 256MB or more memory and 128MB or more Virtual Memory
- **Macintosh Computers:** Not supported by Plato technical support, but program successfully plays on Mac OS X using Virtual PC 6.1 or 7.0 with Windows XP Home.
- Optional: approximately 1GB additional to load data disk information

Suggested participants could include:

- incoming high-school students who haven't gotten from high school sufficient math content,
- returning students who have been away from math and who may have sporadic math-content memory,
- students who find it difficult to travel to campus to attend a class,

- students who may have a time or schedule conflict with campus-scheduled classes due to work or multiple content offerings in simultaneous time slots.

Provided by the program:

- If a single course requires a 2nd textbook/software, RDP will pay the balance over $100.
- Tutoring / questions support via email and phone by instructor
- Program will be loaded on computers on campus at a variety of locations
- Technology support via software provider's toll-free phone & email
- One face-to-face mandatory orientation & training meeting at the outset of the program plus exams
- Additional support media (chat-room help, video classes, live video, phone conferencing, cadre meetings) as determined by the input of the participants.
- Upon successful completion of the pilot, re-taking of the Compass test, and instructor recommendation the student will be granted entrance to the next math level.

Advantages:

- Student can attend class at any hour of the day, 7 days a week from any location in the world
- Program can be loaded at multiple sites (home, work, library, etc) – license is controlled by log-in
- Student has tutoring support through the online program, with re-teaching, applications, and practice available at the pace needed and frequency needed by each individual available instantly.
- Student can move more rapidly through areas which are easy by placing out of the lesson through an overview quiz at the beginning of each lesson. Allows more difficult lessons to be addressed with additional time. This is customized to each and every student's abilities.
- Accelerated calendar available for students wishing to cover more than 1 course during semester.
- Questions can be asked and re-asked with no "shame" since the computer has no judgment, and no one knows what you struggled with and what you didn't.
- Lessons can be "paused" to fit into each individual's life comfortably.
- Instructor can monitor time spent in every part of the lesson, as well as seeing all scores showing strong/weak areas. Easy to customize appropriate support based on this insight.
- Facilitates compression of remediation time necessary prior to taking 100-level course if desired.

A Rural Development Project
For the islands of Hawai'i, Kaua'i, Lana'i Maui and Moloka'i
Maui Community College
310 Ka'ahumanu Avenue MD #68
Kahului, HI 96732

MATH 22, 23/24, 25 - INSTRUCTIONS – MODIFIED 8/21/06

Read completely before starting*

Contact Information:

Course Instructor: **Marty-Jean Bender**
Direct daytime phone: 984-3659 Monday-Thursday 10am-5pm
Cell (night and weekend) phone: 357-3997 Friday/Saturday/Sunday by appointment
Email: marty-jean@hawaiirdp.org website: www.hawaiirdp.org/martyjean ←

Communication:

I will be using your hawaii.edu email address to communicate with you. If you prefer another email address, I recommend you forward you hawaii.edu email address to your preferred email address.

Go to : https://mail.hawaii.edu → Options tab → Settings → Mail forwarding

☑ enable forwarding
☑ or ☐ don't leave a copy on server

marty-jean@hawaiirpd.org

type your preferred email address

Course Materials:

- ***Interactive Mathematics: Elementary Algebra Student Kit*** by PLATO Learning, including Book, CD's and PIN number
- **Additional CD – part 2 from *Interactive Mathematics: PreAlgebra Student Kit*** by PLATO Learning

DO NOT SHARE OR SELL THESE MATERIALS. (There won't be the required NEW validation PIN number necessary for a new user.)

**Lesson CDs should be downloaded onto your computer. Running the program without CDs is recommended if you have the room on your hard drive. It is also recommended if you are using more than one computer to do your lessons. Load disks on as many computers as you will be using. The license is controlled by your actual logging in, not by loading the program. Many places on campus already have the program loaded for your convenience. If there are additional locations you would like to access on campus, please contact the instructor with this information. The lessons will run faster from your hard drive than from the CD and you have less chance of damaging a CD. If a lesson CD is lost or damaged contact your instructor to determine replacement options.

*** ***DO STEPS IN ORDER***

Getting Started on the Lessons:

(1) Find Client Installer CD showing license number on the packet. Follow the instructions inside the packet. (In the next couple weeks you may be asked to input the license number on this packet, so DO NOT DISCARD number.) Instructions are also available at http://support.academic.com/ Getting Started Guide.

(2) Login to Interactive Mathematics (see *How to Log On & Log Off* sheet for further instructions) Explore the Resources section: Getting Started, Tips & Tutorials, and Technical Support sections. In Technical Support visit the Technical Support Website and explore: First Time User FAQs and FAQ section.

- **Note: Technical Support Hours : Monday - Friday 2:00 AM - 5:00 PM Hawaii time (800-681-4357)**

(3) *(optional, but recommended)* Load CDs (see **Course Materials, above, and see *Running IM from a Workstation Hard Drive* sheet.) When at IM homepage, select Getting Started, and go to Run Without CDs for complete instructions.

→ **Load only the 2 Elementary Algebra Disks.** Use the Pre-Algebra disk, part 2 to run lessons F5 and F6.

(4) **Be sure pop-up blockers are disabled.** Log into Interactive Mathematics (see *How to Log On & Log Off* sheet) and do the 2 introductory lessons (see ***Interactive Mathematics Lesson Main Menu*** sheet for reference):

- Getting Started
- Fundamentals Introduction

(5) Process for Recommended Lessons:

- Take the Pre-test in the **Overview**. If you score 80% or higher you can "Save as **Evaluate**" (if it gives this option) Scores between 80-90% may not give you this option. In that case skip to the **Evaluate** module and take the quiz in order to record a score for the lesson, or email instructor to input as test attempt.
- The Pre-test will tell your score for each concept in the lesson. For each concept where the score was under 80% proceed to the **Explain** module and work through those concepts. If you feel you understand all the concepts of this lesson when you have completed the Explain process, proceed to Evaluate quiz.
- If you do not pass the Evaluate quiz on the 1st attempt. Do not retake it until you have reviewed the **Explain** module and practiced in the **Apply** module and done at least some of the homework problems.
- If you do not pass the **Evaluate** quiz on the 2nd attempt, contact the instructor for additional help and to request a 3rd quiz attempt.
- Before moving to the next lesson, view the **Explore** module – this highlights the reason behind the process. Questions from the Explore module will be included in pre-tests and quizzes.

(6) Start and complete lessons 1.0 School of Pythagoras & 1.1 The Real Numbers . Use tools as needed.
Sequence: **Pre-test, Explain, Apply, Homework, Explore, Quiz**

→ **(7) Enter lessons worked on and COMMENT WEEKLY. Go to the CHECK MY PROGRESS area. Click on "Write a comment to your instructor". Start the comment with the numbers of the lessons you have worked on that week (Monday thru Sunday). Be sure to include the letter F if appropriate as F1.1 and 1.1 are not the same lessons. Comments can include response to those lessons about what worked (or didn't work) that week, and questions you might have. Also include problems you had, personal situations (ill, out of town, etc) which explains missing time, what you liked, etc. Include any proposed solutions for issues if you have ideas.**

Example: EI.B, F5.1 – *write your comments….*

Dec 8 is required completion date for coursework
Final exam must be completed by Dec 14 (or earlier)

Prior to Jan 15, 2007:

Retake Math Compass exam

Start with the **Algebra** version of the Compass to assist placement
Submit test results to RDP by surface mail or fax to be received prior to January 15, 2007.

Dates indicated are when you should be STARTING the corresponding lesson.

Math 22	Math 23	Math 22 & Math 23	Interactive Mathematics Lessons	Estimated Hours
Aug 17/21	Aug 17/21	Aug 17/21	1.0 School of Pythagoras	
Aug 17/21	Aug 17/21	Aug 17/21	1.1 The Real Numbers	2
Aug 28		**Aug 21**	1.2 Factoring and Fractions	3
Sep 4		**Aug 28**	1.3 Arithmetic of Numbers	4
Sep 11		**Aug 28**	EI.A Fractions (review)	4
Sep 18	Aug 21	**Sep 4**	EI.B Signed Numbers (review)	2
Sep 25		**Sep 4**	F5.1 Geometry I	4
Oct 2		**Sep 11**	F5.2 Geometry II	4-6
Oct 9		Sep 18	F5.3 Geometry III	4-6
Oct 16		**Sep 23**	F6.1 Units of Measurement	4-6
Oct 23	Aug 21	Sep 23	2.0 Old Number Trick	
Oct 23	Aug 21	Sep 23	2.1 Algebraic Expressions	2
Oct 30	Aug 28	**Sep 30**	2.2 Solving Linear Equations	3
Nov 6	Aug 28	Sep 30	2.3 Problem Solving	4
Nov 13		**Oct 2**	2.4 Linear Inequalities	2
Nov 20		Oct 2	6.0 King of Persia	
Nov 20		Oct 2	6.1 Exponents	2
Nov 20		Oct 2 **	6.2 Polynomial Operations I	4
Nov 27		Oct 16 **	7.0 The Factor Gallery	
Nov 27		Oct 16	7.1 Factoring Polynomials I	4
	Sep 4	Oct 23	F6.2 Interpreting Graphs	2-3
	Sep 4	Oct 23	F6.3 Introduction to Statistics	2-3
	Sep 11	Oct 30	3.0 Story of Decartes	
	Sep 11	Oct 30	3.1 Introduction to Graphing	3
	Sep 18	Oct 30	4.0 The Classroom	
	Sep 18	Oct 30	4.1 Graphing Equations	5
	Sep 25	Nov 6	4.2 The Equation of a Line	3
	Oct 2	Nov 6	4.3 Graphing Inequalities	2
	Oct 2	Nov 13	5.0 The Great Train Rescue	
	Oct 2	Nov 13	5.1 Solving Linear Systems	3
	Oct 9	Nov 13	5.2 Problem Solving	2
	Oct 16	Nov 20	5.3 Systems of Inequalities	2
	Oct 16		6.0 King of Persia	
	Oct 16		6.1 Exponents	2
	Oct 23		6.2 Polynomial Operations I	4
	Oct 30	**Oct 9	6.3 Polynomial Operations II	4
	Nov 6		7.0 The Factor Gallery	
	Nov 6		7.1 Factoring Polynomials I	4
	Nov 13	**Oct 16	7.2 Factoring Polynomials II	4
	Nov 20	Nov 20	8.2 Rational Expressions II	2
	Nov 27	Nov 27	10.0 Formula Machines	
	Nov 27	Nov 27	10.1 Quadratic Equations I	2
	Nov 27	Nov 27	10.2 Quadratic Equations II	3

Self-selection Evaluation

Are you:

- A graduating high school student who doesn't have a strong enough math backround for college?
- A returning student who has been away from math and who has sporadic math-content memory?
- A student who finds it difficult to travel to campus to attend a class physically?
- A student who has a time or schedule conflict with campus-scheduled classes due to work or multiple content offerings in simultaneous time slots?
- A person who would rather learn in the privacy of your own space?
- Someone who has concerns about asking for and getting enough help within a classroom situation?
- An employed student who may need to travel or otherwise miss class times during the semester?

Then this delivery option may be PERFECT for you!

Be realistic:

- Are you HIGHLY self-motivated?
- Will you schedule your own class times? (7-10 hours per week is average)
- Can you keep yourself on a schedule?
- Do you have access to an internet-connected computer?
- If your computer is a Macintosh, are you willing to purchase/download Virtual PC with Windows, Parallels Workstation, Boot Camp or other similar PC emulator program?
- Are you willing to learn to use computer-based technology?
- If you need help beyond the computer tutoring and text book, will you ask for it?
- Will you put in extra time in order to get through a difficult lesson?
- Are you willing to monitor your email regularly and communicate via email?
- Will you attend 1 training and orientation session on campus prior to beginning this course?
- Will you arrange for a proctored mid-term and final for yourself? (On campus at MCC the TLC will be available.)

If you answered "YES!" to all of these.....

then this is the class for YOU!

Based on :
Leeward CC and Maui CC
content distribution

Plato Interactive Mathematics
Concept Alignment to College Math Courses

Plato Interactive Mathematics Content			Course Coverage			
Section #	Section title	Hrs	Basic Math	22	23/24	25
F1.1	Whole numbers I	8	X			
F1.2	Whole numbers II	6	X			
F2.1	Fractions I	6	X	EI.A		
F2.2	Fractions II	6	X	EI.A		
F2.3	Decimals I	6	X			
F2.4	Decimals II	6	X			
F3.1	Ratio and Proportion	6	X			
F3.2	Percent	8	X			
F4.1	Signed Numbers I	6	X	EI.B	EI.B	
F4.2	Signed Numbers II	6	X	EI.B	EI.B	
F5.1	Geometry I	4		X		
F5.2	Geometry II	6		X		
F5.3	Geometry III	6		X		
F6.1	Units of Measurement	6		X		review
F6.2	Interpreting Graphs	3			X	
F6.3	Introduction to Statistics	3			X	
1.1	The Real Numbers	2	X	review	review	
1.2	Factoring and Fractions	3	X	review		
1.3	Arithmetic of Numbers	2	X	review		
2.1	Algebraic Expressions	2		X	review	
2.2	Solving Linear Equations	3		X	review	EII.C
2.3	Problem Solving	4		X	review	review
2.4	Linear Inequalities	2		X		EII.C
3.1	Introduction to Graphing	3			X	X
4.1	Graphing Equations	5			X	EII.E
4.2	The Equation of a Line	3			X	
4.3	Graphing Inequalities	2			X	
5.1	Solving Linear Systems	3			X	review
5.2	Problem Solving	2			X	review
5.3	Systems of Inequalities	2			X	
6.1	Exponents	2		X	review	EII.A
6.2	Polynomial Operations I	4		X	review	EII.B
6.3	Polynomial Operations II	4			X	review
7.1	Factoring Polynomials I	4		X	X	EII.B
7.2	Factoring Polynomials II	4			X	EII.B
7.3	Factoring by Patterns	2				X
EII.F	Absolute Value	3				X
8.1	Rational Expressions I	2				X
8.2	Rational Expressions II	2			X	X
8.3	Equations with Fractions	2				X
8.4	Problem Solving	2				X
9.1	Roots and Radicals	3				X
9.2	Rational Exponents	4				X
10.1	Quadratic Equations I	2			X	review
10.2	Quadratic Equations II	3			X	review

Based on :
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Plato Interactive Mathematics
Concept Alignment to College Math Courses

Section #	Section title	Hrs	Basic Math	22	23/24	25
Plato Interactive Mathematics Content			Course Coverage			
Section #	Section title	Hrs	Basic Math	22	23/24	25
F1.1	Whole numbers I	8	X			
F1.2	Whole numbers II	6	X			
F2.1	Fractions I	6	X			
F2.2	Fractions II	6	X			
F2.3	Decimals I	6	X			
F2.4	Decimals II	6	X			
F3.1	Ratio and Proportion	6	X			
F3.2	Percent	8	X			
F4.1	Signed Numbers I	6	X			
F4.2	Signed Numbers II	6	X			
1.1	The Real Numbers	2	X			
1.2	Factoring and Fractions	3	X			
1.3	Arithmetic of Numbers	2	X			
F2.1	Fractions I	6	EI.A			
F2.2	Fractions II	6	EI.A			
F4.1	Signed Numbers I	6	EI.B			
F4.2	Signed Numbers II	6	EI.B			
F5.1	Geometry I	4	X			
F5.2	Geometry II	6	X			
F5.3	Geometry III	6	X			
F6.1	Units of Measurement	6	X			
1.1	The Real Numbers	2	review			
1.2	Factoring and Fractions	3	review			
1.3	Arithmetic of Numbers	2	review			
2.1	Algebraic Expressions	2	X			
2.2	Solving Linear Equations	3	X			
2.3	Problem Solving	4	X			
2.4	Linear Inequalities	2	X			
6.1	Exponents	2	X			
6.2	Polynomial Operations I	4	X			
7.1	Factoring Polynomials I	4	X			

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content distribution

Plato Interactive Mathematics
Concept Alignment to College Math Courses

Section #	Section title	Hrs	Basic Math	22	23/24	25
F4.1	Signed Numbers I	6			EI.B	
F4.2	Signed Numbers II	6			EI.B	
F6.2	Interpreting Graphs	3			X	
F6.3	Introduction to Statistics	3			X	
1.1	The Real Numbers	2			review	
2.1	Algebraic Expressions	2			review	
2.2	Solving Linear Equations	3			review	
2.3	Problem Solving	4			review	
3.1	Introduction to Graphing	3			X	
4.1	Graphing Equations	5			X	
4.2	The Equation of a Line	3			X	
4.3	Graphing Inequalities	2			X	
5.1	Solving Linear Systems	3			X	
5.2	Problem Solving	2			X	
5.3	Systems of Inequalities	2			X	
6.1	Exponents	2			review	
6.2	Polynomial Operations I	4			review	
6.3	Polynomial Operations II	4			X	
7.1	Factoring Polynomials I	4			X	
7.2	Factoring Polynomials II	4			X	
8.2	Rational Expressions II	2			X	
10.1	Quadratic Equations I	2			X	
10.2	Quadratic Equations II	3			X	
F6.1	Units of Measurement	6				review
2.2	Solving Linear Equations	3				EII.C
2.3	Problem Solving	4				review
2.4	Linear Inequalities	2				EII.C
3.1	Introduction to Graphing	3				X
4.1	Graphing Equations	5				EII.E
5.1	Solving Linear Systems	3				review
5.2	Problem Solving	2				review
6.1	Exponents	2				EII.A
6.2	Polynomial Operations I	4				EII.B
6.3	Polynomial Operations II	4				review
7.1	Factoring Polynomials I	4				EII.B
7.2	Factoring Polynomials II	4				EII.B
7.3	Factoring by Patterns	2				X
EII.F	Absolute Value	3				X
8.1	Rational Expressions I	2				X
8.2	Rational Expressions II	2				X
8.3	Equations with Fractions	2				X
8.4	Problem Solving	2				X
9.1	Roots and Radicals	3				X
9.2	Rational Exponents	4				X
10.1	Quadratic Equations I	2				review
10.2	Quadratic Equations II	3				review

UNIVERSITY OF HAWAI'I

Committee on Human Studies

MEMORANDUM

October 31, 2007

TO: Marty-Jean Bender
Principal Investigator
Educational Technology

FROM: William H. Dendle
Executive Secretary

SUBJECT: CHS #15639- "Program Evaluation of Online-Delivered Developmental Math Courses"

Your project identified above was reviewed and has been determined to be exempt from Department of Health and Human Services (DHHS) regulations, 45 CFR Part 46. Specifically, the authority for this exemption is section 46.101(b)(4). Your certificate of exemption (Optional Form 310) is enclosed. This certificate is your record of CHS review of this study and will be effective as of the date shown on the certificate.

An exempt status signifies that you will not be required to submit renewal applications for full Committee review as long as that portion of your project involving human subjects remains unchanged. If, during the course of your project, you intend to make changes which may significantly affect the human subjects involved, you should contact this office for guidance prior to implementing these changes.

Any unanticipated problems related to your use of human subjects in this project must be promptly reported to the CHS through this office. This is required so that the CHS can institute or update protective measures for human subjects as may be necessary. In addition, under the University's Assurance with the U.S. Department of Health and Human Services, the University must report certain situations to the federal government. Examples of these reportable situations include deaths, injuries, adverse reactions or unforeseen risks to human subjects. These reports must be made regardless of the source funding or exempt status of your project.

University policy requires you to maintain as an essential part of your project records, any documents pertaining to the use of humans as subjects in your research. This includes any information or materials conveyed to, and received from, the subjects, as well as any executed consent forms, data and analysis results. These records must be maintained for at least three years after project completion or termination. If this is a funded project, you should be aware that these records are subject to inspection and review by authorized representatives of the University, State and Federal governments.

Please notify this office when your project is completed. We may ask that you provide information regarding your experiences with human subjects and with the CHS review process. Upon notification, we will close our files pertaining to your project. Any subsequent reactivation of the project will require a new CHS application.

Please do not hesitate to contact me if you have any questions or require assistance. I will be happy to assist you in any way I can.

Thank you for your cooperation and efforts throughout this review process. I wish you success in this endeavor.

Enclosure

2540 Maile Way, Spalding 253, Honolulu, Hawai'i 96822-2303
Telephone: (808) 956-5007, Facsimile: (808) 956-8683, Website: www.hawaii.edu/irb

OMB No. 0990-0263

Protection of Human Subjects
Assurance Identification/IRB Certification/Declaration of Exemption
(Common Rule)

Policy: Research activities involving human subjects may not be conducted or supported by the Departments and Agencies adopting the Common Rule (56FR28003, June 18, 1991) unless the activities are exempt from or approved in accordance with the Common Rule. See section 101(b) of the Common Rule for exemptions. Institutions submitting applications or proposals for support must submit certification of appropriate Institutional Review Board (IRB) review and approval to the Department or Agency in accordance with the Common Rule.

Institutions must have an assurance of compliance that applies to the research to be conducted and should submit certification of IRB review and approval with each application or proposal unless otherwise advised by the Department or Agency.

1. Request Type	2. Type of Mechanism	3. Name of Federal Department or Agency and, if known, Application or Proposal Identification No.
[ ] ORIGINAL [ ] CONTINUATION [X] EXEMPTION	[ ] GRANT [ ] CONTRACT [ ] FELLOWSHIP [ ] COOPERATIVE AGREEMENT [ ] OTHER:_____	
4. Title of Application or Activity "Program Evaluation of Online-Delivered Developmental Math Courses"		5. Name of Principal Investigator, Program Director, Fellow, or Other Marty-Jean Bender

6. Assurance Status of this Project *(Respond to one of the following)*

[X] This Assurance, on file with Department of Health and Human Services, covers this activity:
Assurance Identification No. F-3526, the expiration date September 23, 2008 IRB Registration No. IORG0000169

[ ] This Assurance, on file with *(agency/dept)*_____, covers this activity.
Assurance No._____, the expiration date_____ IRB Registration/Identification No._____*(if applicable)*

[ ] No assurance has been filed for this institution. This institution declares that it will provide an Assurance and Certification of IRB review and approval upon request.

[X] Exemption Status: Human subjects are involved, but this activity qualifies for exemption under Section 101(b), paragraph 4.

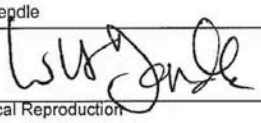
7. Certification of IRB Review (Respond to one of the following IF you have an Assurance on file)

[ ] This activity has been reviewed and approved by the IRB in accordance with the Common Rule and any other governing regulations.
by: [ ] Full IRB Review on (date of IRB meeting) _____ or [ ] Expedited Review on (date)
[ ] If less than one year approval, provide expiration date _____

[ ] This activity contains multiple projects, some of which have not been reviewed. The IRB has granted approval on condition that all projects covered by the Common Rule will be reviewed and approved before they are initiated and that appropriate further certification will be submitted.

8. Comments

CHS #15639

9. The official signing below certifies that the information provided above is correct and that, as required, future reviews will be performed until study closure and certification will be provided.	10. Name and Address of Institution
11. Phone No. *(with area code)* (808) 956-5007 12. Fax No. *(with area code)* (808) 956-8683 13. Email: dendle@hawaii.edu	University of Hawaii at Manoa 2444 Dole Street, Bachman Hall Honolulu, HI 96822
14. Name of Official William H. Dendle	15. Title Compliance Officer
16. Signature 	17. Date October 31, 2007

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