
Should Tutoring Services be Added to our High-Enrolling Distance Education Courses?

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Introduction

Distance learning administrators are always looking for ways to balance increasing demands on instructor time, rising expectations from students and faculty for support services, mounting competition, and escalating costs with quality instruction and interaction. Increasingly, programs are responding to these competing interests by appending ancillary resources to course materials and textbooks and by using computer-mediated communication (CMC) tools, e.g., e-mail, online bulletin and discussion boards, blogs, interactive television, and computer conferencing. Yet there is inconclusive evidence that the CMC tools are successful in helping students better learn the course content (Garrison, Anderson, & Archer, 2003). Additionally, although interaction may be increased when students are *required* to post on discussion boards, the quality of that interaction is often artificial, mechanical, and “noninteractive” rather than sincere and motivated (Garrison, Anderson, & Archer, 2003; Stevens, 2003). One part of the solution to this larger problem, explored by one large distance education program, was the use of part-time tutors hired from the university's undergraduate student population, to offer additional content and motivational support to students enrolled in large enrolling courses.

A tutoring service, in concept, would only enhance student learning, support, and satisfaction while mitigating demands on faculty time, particularly when it comes to providing more meaningful student-to-instructor/tutor interaction. This intervention should also help students better master course content and complete course assignments. A tutoring service may also provide a scalable and cost-effective solution for courses with already high and growing

enrollment numbers by leveraging scarce faculty time. Tutoring services could also minimize student complaints as distance education programs anticipate—rather than react to—student support needs. Another program benefit could be a marketing and competitive one as students shop for those programs with value-added services.

Research Questions

The researchers of this study selected four pragmatic research questions that distance learning administrators with high-enrolling Independent Study courses, similar to those that Brigham Young University offers through its Department of Independent Study, may be interested in exploring. These four questions about student *demand* for tutors, financial *sustainability* of adding tutors to the course, providing the right *logistical* communication infrastructure, and the overall *scalability* of applying a few tutors too many students were informed by previous pilot studies with tutors:

- When tutoring services are made available in a high-enrolling Independent Study course, how much will they be used (demand)?
- Would students be willing to pay for the service (sustainability)?
- How will students prefer making contact with their tutor (logistics)?
- Does it appear that an on-demand tutoring service could scale with a growing distance education program (scalability)?

Background

Independent Study is a nonsubsidized, financially self-sustaining unit of the Division of Continuing Education at Brigham Young University, a research institution and large private university in the western United States. Independent Study offers over 450 Web and 600 paper-based courses at secondary and university levels. At the time of this writing, Independent Study is serving over 130,000 enrollments a year, with students in every state and 60 other countries. It has experienced annual growth of its enrollments in excess of ten percent for the past five years. Unlike many other distance education programs, Independent Study courses follow a noncohort class model. Students may enroll in a course at any time and work at their own pace for 12 months from their date of enrollment, with the option of extending the completion deadline for another three months for a small fee.

Independent Study is committed to offering the best possible learning opportunities—including student support services, at affordable prices, to a large number of students who desire quality self-initiated learning experiences. Meeting the measure of this mission has required ingenuity and creativity in using just the right blend of technological and instructor intervention not only specific to each course but also to each lesson. For example, instructional designers and instructors at Independent Study have developed a sophisticated and automated feedback system known as Speedback™ wherein students receive personalized and immediate feedback for computer-graded, multiple-choice assignments associated with a lesson. Whenever multiple-choice items are inadequate to assess lesson or course objectives, instructor-graded assignments and interventions are employed.

Each Speedback assignment is tied directly to the learning objectives and standards for the lesson. Instructors create distracters (wrong answers) that represent common misconceptions in students' understanding. Then, they compose instructional feedback for each wrong answer to explain why the student's answer was incorrect, provide a hint about the correct answer, and direct the student to the section of the learning material where the subject is discussed. When students submit their lessons, the computer scores each item and also compiles the immediate, personalized instructional feedback to help them learn from their mistakes.

Independent Study maintains a special projects team dedicated to assessment and measurement, research, and continuous improvement. Several pilot studies using tutoring services were conducted by this special projects team before the one reported in this study. Between January 2003 and June 2005, Independent Study conducted pilot tutoring services in Statistics 221; History 201; Philosophy 110, 205, and 305; and Mathematics 110. The early pilots and feasibility studies examined the effects of tutoring services on student achievement, satisfaction, completion, and on overall cost effectiveness and scalability across courses.

Literature Review

Few distance education programs have researched, and even fewer have written about, the use and design of tutoring services for their students and more especially for high enrolling Independent Study courses. However, the tutoring model appears to answer the need for increased interaction between students and faculty or students and other students. This interaction is recognized as an essential characteristic of quality education (The Institute of Higher Education Policy, 2000), and many have advocated increased interaction as a solution to the demand for student support. Shea and Lewis (2001) found that students' two most important instructional needs were more timely feedback and more student-instructor interaction. And while discussion about computer-mediated communication tools is important, Cheney (2002) writes that "the quality of human interaction is more critical than the technology as a predictor of success (Kelsey, Lindney, & Dooley, 2002, p. 25)" (p. 4). Moreover, student-teacher interaction is not just important to students. A study by Beaudoin (2003) "confirmed findings of other research activities which have concluded that quantity and quality of interaction between students and faculty and students with other students are the factors most closely associated with faculty satisfaction with distance teaching" (p. 1640).

In many ways, the distance education environment can facilitate strong student-faculty interaction more easily than traditional education, in that the "role of the professor shifts from that of authority to the role of course manager" (Roberson & Klotz, 2002, p. 2; Scagnoli, 2001, p. 21). This is especially true in low-enrolling and limited-enrollment courses. The functions course managers perform include "facilitator, teacher, organizer, grader, mentor, role model, counselor, coach, supervisor, problem solver, and liaison" (Riffee, 2003, p. 1). Since distance education instructors are relieved of much of the "responsibility of 'covering the content,' they are [able] to engage in 'customized coaching'" (Offir, Barth, Lev, & Shteinbok, 2003, p. 67). From an administrative standpoint, these interactive approaches require more investment in human rather than technological resources (Allen, 2001). When a tutoring service is offered for a distance education course, a tutor assumes some of these "course management" and "coaching" roles, interacting directly with students using telephone, e-mail, instant messaging, etc.

Varying degrees of faculty-to-student, student-to-student, and student-to-content interaction establish the foundation of learning for all students. However, it may not be scalable or necessary to do all of these things all of the time, especially in a distance learning model with high

enrolling courses. Thus Anderson (2002) noted:

Sufficient levels of deep and meaningful learning can be developed as long as one of the three forms of interaction (student-teacher, student-student, student-content) is at very high levels. The other two may be offered at minimal levels or even eliminated without degrading the educational experience. High levels of more than one of these three modes will likely deliver a more satisfying educational experience, though these experiences may not be as cost or time effective as less interactive learning sequences. (Anderson, 2002, p. 4)

Interaction is the standard for “deep and meaningful learning” for all learners and distance educators must work harder at facilitating the right balance of interaction among all three types of interaction because of its distributed educational setting.

If students utilize a tutoring service, shouldn't it help a distance education student overcome “feel[ing] somewhat lost in an environment that relies heavily on individual initiative and independent learning” (Otton, 2003, p. 28)? By increasing the quantity and instructional quality of interaction through a tutoring service, shouldn't a distance education program be better able to motivate distance students to succeed in a nontraditional education setting?

Holmberg (2003) wrote: “Central to learning and teaching in distance education are personal relations between the parties concerned . . . and empathy between students and those representing the supporting organization. . . . Such feelings are fostered by . . . supplementing the course [materials with] friendly mediated interaction between students [and] tutors” (pp. 81-2). Holmberg asserts further that tutors representing the supporting institution can, through their additional interactions and support, promote student motivation. However, all of this assumes that students will actually use the tutoring service—the primary research question of this study.

Methodology

Participants

The researchers selected a college algebra Independent Study course (Math 110) with its students for this quasi-experimental study. Math 110 had more than 1,400 enrollments the year prior to the study. The course consists of 17 lessons, 2 midcourse exams, and a final comprehensive exam. All of the exams are of the Speedback type, utilizing multiple-choice and matching questions that require the students to work through problems before selecting answers. Math 110 was chosen for this study because it is one of Independent Study's highest-enrolling university courses and because it receives a number of calls from students asking for additional help with the course content.

All students (N=331) who took their first Math 110 midcourse exam between October 2004 and January 2005 were included as participants in this study. The 51% (168) students who took the exam during December or January comprised the treatment group. All of these students were invited, at the time of their first exam, to utilize Independent Study's *free* Math 110 tutoring service any time they needed additional support for six months following the date of their first exam.

Although the demographics for the participants varied, the majority could be considered typical college students. Approximately 46% were female, and a little over half were from Utah and

California, with the rest dispersed across most of the 50 states. Approximately 16% were in their teens, 63% in their 20s, 10% in their 30s, and 10% in their 40s or older. Many enrolled in the course as a graduation requirement, whether they were nontraditional students working toward an external degree, or matriculated on-campus students who found Independent Study convenient.

Tutor

The tutor would ideally be a current undergraduate student at the university, preferably a math major, who was not only proficient in math but who also possessed strong interpersonal and communication skills. The tutor hired for this study was a male undergraduate student majoring in mathematics. He was selected from among other qualified applicants with a proficiency in math because of his friendly manner, desire to help other students, and ability to explain course concepts in plain terms. The tutor also received additional training in distance tutoring from Independent Study and met regularly with the other tutors engaged in the smaller-scale pilot studies introduced previously.

The students could interact with the Math 110 tutor any time they had questions or concerns using whatever communication medium they found most convenient and effective, e.g., e-mail, phone, instant messaging, etc. The tutor e-mailed students his office hours and responded to all e-mails and messages within one business day. The part-time undergraduate tutor also monitored learners' progress, provided study tips and deadline reminders, and offered encouragement along the way.

Instruments

As the tutor worked with students, he recorded the date, time, duration, and nature of each interaction; he also submitted students' frequently asked questions and his responses to a electronic knowledgebase. The students were also asked at the end of their final exam whether or not they would pay an additional \$30 fee for the help of a tutor if they were to take another Independent Study course similar to the Math 110 course they had just completed.

The data were collected into two database systems. The first was Independent Study's student information system, RS 6000, which stores student enrollment records, midcourse and final exam scores and dates, course completion dates, and the student response to their willingness to pay a fee for tutoring services. The second database, created by the tutor using Microsoft Access software, was an electronic record of each interaction he had with a student. Although originally collected in separate databases, the data were merged in the special projects database and connected by means of students' identification numbers. These identification numbers were used to protect the anonymity of each student as encouraged by the university's institutional review board (IRB). The data were then exported for statistical analysis using SPSS statistical software.

Results

One-quarter (43) of the students in the treatment group interacted at least once with the Independent Study tutor (25.6%, $n = 168$). The tutor logged a total of 43.2 hours over a six-month period supporting the 43 students interested in tutor assistance for an average of 60.3 minutes, or just over an hour for each student. However, the median number of interactions by interested students with the tutor was 2.0 for a total median time period of 5.0 minutes for each student. The reason that median interactions and time is reported is because the mean results

would skew findings of central tendency since one of the 43 students had 25 interactions with the tutor in which 19.5 hours or 45.2% of the total tutor's time was used.

Furthermore, 96.6% of the tutor's recorded interaction time was spent answering student-initiated, content-related questions, while 3.4% of the interaction time was tutor-initiated contact (sending invitations to participate, deadline reminders, etc.). His time was split across the following communication methods with the percentage of use parenthetically reported: e-mail (41.4%), phone (57.3%), and face-to-face (1.2%) interactions. However, if the time spent by the tutor with the one student, mentioned above, is adjusted out of the calculations—most of whose interaction time was on the phone—the allocation of interaction time among communication methods is more accurately represented as follows: e-mail (72.3%), phone (25.6%), and face-to-face (2.1%).

Of the 331 participants, one-third (110) responded to the optional question administered with the final examination about their willingness to paying a fee for tutoring services. About three-fifths (58.9%) of the respondents indicated they would be willing to pay a \$30 fee for future use of a tutor in a similar situation.

Discussion

The research question of primary significance in this study was how much students would use the tutoring service—the result was that only a quarter of the students chose to use it. Further, the tutor was able to help most students more efficiently than expected because of the emerging knowledgebase that contained answers to previously and frequently asked questions. Thus, the amount of time spent by the tutor helping students and answering questions was lower than expected. This finding is especially important for high-enrolling, individually-paced courses, such as those at BYU Independent Study, since one relatively inexpensive part-time undergraduate tutor was able to readily meet the tutoring demand for a large number of students. It is also reasonable to expect because of efficiencies of scale. that it will be more cost effective for one tutor to serve 100s of students enrolled in the same course than it would be to serve the same number of students distributed over several lower-enrolling courses.

Another interesting and unexpected finding involved the one student who consumed nearly half of the time spent by the tutor helping all other students interested in the tutoring services. While this one student may have most benefited from this tutoring service, did it come at the expense of the other students? How would it impact the scalability and sustainability of the entire tutoring service? Administrators may consider establishing guidelines to control the amount of maximum tutor time available to each student to better manage circumstances like that experienced by the tutor in this study. Independent Study is presently testing its own policy for excessive users of the tutoring service as a result of this study.

The second research question focuses on the financial sustainability of the service. The findings for this research question seem to suggest that tutoring services for high enrolling courses may be sustainable for at least the following three reasons: (1) the majority (58.9%) of respondents reported a willingness to pay a \$30 tutoring fee, (2) actual demand for tutoring time was less than expected, and (3) unexpected efficiencies gained through the use of a knowledgebase. While the \$30 fee for tutoring services was a generous estimate to cover the costs of an undergraduate student tutor working as many as 600 hours (20 hours each week) over a seven-month period the tutor actually worked only 110 hours helping Math 110 students. It is also likely that a larger

percentage of students would be willing to pay for a tutoring service if the expense was less than \$30; this could allow Independent Study to cover costs by distributing a smaller fee over a larger number of students. This study and tacit analysis provides support for the case of financially sustaining tutoring costs inherent in a large Independent Study course like Math 110.

In addition to the potential for recovering costs by charging students, the tutoring service may decrease overall program costs. When students have questions they send an e-mail to the Independent Study department where student service representatives filter out logistical matters and forward content questions on to instructors. Forwarding questions to busy professors and then following up to see that they are answered and returned to the student in a timely manner is labor extensive. It is likely that the tutoring service would mitigate the time and labor required to support students by faculty and support staff alike. It may also increase students' satisfaction since questions may be answered more efficiently.

Finally, if successfully marketed, the tutoring service may help generate additional enrollments and help further subsidize the service. The low demand for the tutoring service observed in this study may also suggest a do-it-on-your-own learning style for many of the students who self-select Independent Study courses. Perhaps other students who do not take these Independent Study courses may consider doing so if a tutor and an instructor were more readily available to assist them.

The results to the third research question revealed students' interest in communicating with their tutor via asynchronous e-mail. It also portends the importance of distance education programs remaining flexible to changing student demographics and communication technologies and patterns. One of the unanticipated surprises from this study was the ease in which the written e-mail interactions between tutor and students could be folded into a knowledgebase for future use by tutor and student alike. The well-composed e-mail responses by the tutor were reused by subsequent students, who had the same questions, for a fraction of the time and expense of the original e-mail interaction between tutor and student. Furthermore, this knowledgebase will enable instructional designers and instructors to better refine instructional materials in those instances where questions and concerns continue to arise about confusing or poorly explained instruction.

Admittedly, one small pilot offered in one course for a few months cannot generate sufficient data to adequately estimate the scalability of a service for hundreds of courses and tens of thousands of students over years to come. However, even preliminary results can help inform (1) distance learning administrators making decisions about the use of tutors in some or all of their courses; and, (2) researchers interested in exploring more thoroughly and scientifically some of the questions that presently exist, and will yet exist.

Now, the fourth research question: scalability. At this point, the issue of scalability is best addressed within the context of the previous findings. Specifically, the small demands per student on tutor time demonstrate the practicality of providing a tutor for high-enrollment, core-subject courses like Math where one tutor can serve thousands of students. The findings also seem to suggest that the service is scalable since undergraduate tutors are more accessible and much less expensive than professors. Further, as discussed in the treatment of the second research question, the findings imply the potential to recover costs by charging a fee, improving the efficiency of the corrections process, and increasing the program's marketability and enrollments. Further, the logistical results demonstrate the reusability of responses to frequently asked questions using e-mail as the preferred medium of communication by creating an

electronic knowledgebase.

Implications, Limitations, and Future Research

The intent of this study was more practical and exploratory than it was theoretical and scientific. However, even preliminary findings seem to suggest the importance of more applied and theoretical studies using both qualitative and quantitative design approaches. There is especially a great need for more theoretical and feasibility research on the use of tutoring models by distance learning administrators, including the use of commercial tutoring services (e.g., www.SmarThinking.com, www.TutorVista.com, etc.) in partnership with distance education programs.

Administrators must accurately predict student demand for tutoring services and match it to tutoring service capacity for this intervention to be more sustainable and scalable. As follow-up studies define and predict demand, they could focus increasingly on identifying, refining, and measuring the tutoring effects. Best practices should certainly build on those identified as effective for face-to-face tutors; however, they should also include those more unique to distance learning.

Further, the logistical arrangements necessary for student use of tutors as a function of student demand to be more efficient, cost-effective, and flexible should also be explored. Other efforts could serve to increase the accessibility and efficiency of tutors by allowing them to telecommute and by sharing them across programs, institutions, and time zones. Cross-course comparisons of such practices will also help to identify which practices are best for certain content domains. Increasing the sensitivity of measurements (e.g., inviting students to respond to a few evaluative questions after each interaction with the tutor) would also increase the statistical power to detect differences in follow-up interventions. Finally, additional empirical studies will better inform distance learning administrators on what attracts students most to using tutors and other tutoring service effects.

Conclusion

While this study has led BYU Independent Study to some preliminary answers to its four pragmatic research questions within the context of a high-enrolling, introductory undergraduate math course, it is also clear that more research and experimentation with tutoring models is needed. Furthermore, unanticipated findings and research opportunities—more questions than answers—have resulted from this study which merit further investigation, e.g., the striking difference between perceived and actual demand for the tutoring service by the students, etc.

Self-sustaining distance learning institutions must operate within the bounds of financial viability and scalability to survive in a modern educational economy, especially at a time when competition is becoming increasingly fierce (Bates, 2000; Kariya, 2003). With quality faculty and curriculum held constant across distance education programs, it is quality support services, such as tutoring, that will provide distance education programs with the competitive edge in today's educational milieu.

Brigham Young University's Independent Study is pleased with the results of its early foray into providing tutoring services for its Math 110 students. Will Independent Study roll out and scale up its tutoring support to all of its courses as a result of this study? Not yet. However,

Independent Study will move forward with its effort to better match and build tutoring capacity with student demand while seeking to better understand the tutoring dynamics that most influence student use. At the same time, Independent Study will seek to maintain its competitive edge by providing those student support services, such as tutoring, that really do make a difference for its students and faculty. Finally, Independent Study and other similar programs will most benefit from future research that explores practical and theoretical questions associated with making tutoring services available to its distance education students.

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