Is bigger better? Faculty perceptions of cost versus impact of small and large-scale technology projects

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As faculty continue to allocate time, effort, and money toward using technology for teaching and learning purposes, they must determine the impact and value of their use of technology on student learning. This paper discusses the impact of small and large-scale technology projects from the experiences of BYU faculty members who have worked with personnel at the Center for Instructional Design (CID) on projects to improve teaching and learning. The results of this study will have implications to faculty, administrators, and instructional designers who are trying to gain a better understanding of how to facilitate the type of technology projects faculty should utilize and how to yield the greatest impact on student learning. The study compares faculty perceptions of the value of large-scale projects with small-scale projects. Faculty efforts to evaluate the impact of their projects on student learning are also reported. The findings in this paper have implications for resource allocation and technology project support at institutions of higher education.

Keywords educational technology projects; faculty; teaching; student learning; impact; instructional design

1. Background

Significant investments in time, money, and effort are being made in the development and application of technology to improve teaching and learning in institutions of learning throughout the world [1]. During the past decade, funds spent on technology for educational purposes have tripled throughout the United States [2].

The Center for Instructional Design (CID) is a department at Brigham Young University which partners with faculty on a variety of levels to help improve teaching and learning. Each year personnel complete more than 180 large and small-scale technology projects, expending a considerable amount of money and thousands of hours of labor to help faculty improve teaching and learning. However, measuring the impact of small and large-scale technology projects is often neglected by faculty, and the CID.

2. Methodology

The CID currently supports a broad range of faculty projects to support on-campus instruction (see Table 1). In addition they support large-scale Independent Study projects designed for a distance learning audience. There are also "Technology Innovators" across campus who typically complete small-scale projects without any support from the CID. The purpose of this study is to look at the impact versus cost of the various types of projects from the faculty perspective, and particularly to see if there is a significant difference between large and small-scale projects supported by CID. Large-scale projects are defined as those typically requiring more than 50 hours of work by the CID, and small-scale projects are those requiring less than 50 hours of work. In addition, small-scale projects usually cost less than

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$20,000 (although some projects of this scope can cost up to $40,000). Large-scale projects typically range from $40-$60,000 to complete, although some large-scale projects have cost as much as $250, 000.

Table 1. Descriptions of projects and services supported by the Center for Instructional Design (CID)

Category	Projects and Services	Description
Large-Scale Projects	Committee for Instructional and Media Arts Projects (CIMA)	The CID works with faculty to create projects that help to solve instructional problems and to enhance high enrolling undergraduate courses. The projects are designed to have significant cost savings, and/or to improve the students' understanding of the subject matter.
	Faculty Fellowships (FF)	A Faculty Fellowship consists of a one-year program in which a select group of faculty comes together to analyze their teaching and the technology they use, then create a project to improve student learning.
Small-Scale Projects and Services	Mini-Projects (MP)	Mini projects at the CID are created to help faculty improve teaching and learning. Students who are employed at the CID's Instructional Media Center work up to 50 hours on a faculty project.
	Personal Tech Training (TT)	Personal Tech Training sessions provide faculty with the opportunity to scope, design, and begin to develop an instructional media project in half a day. Faculty receive hands-on, personalized attention as they learn how to incorporate an instructional element of technology into their classes.
	Technology Learning Lab (TLL)	The lab provides support for faculty who come to the CID for help with CDR archiving/burning, digital imaging, digital video/audio, interactive multimedia: Flash, Quick Time, Blackboard consultation, PowerPoint consultation: background design, and integrating video/sound into PowerPoint.
Other	Independent Study (IS)	The CID works with academic departments at BYU to develop university courses for Independent Study. The courses are developed based on the priorities of the college deans and department chairs.
	Technology Innovators (TI)	Faculty who create technological projects for classroom use, without the assistance of the CID (typically under 50 hours of faculty effort).

This study is based on 600 faculty members who worked with CID on projects between 2003-2006. These individuals were sorted by the seven project types and further subdivided into three rough discipline-related groups based on their college affiliation. A random stratified sample was drawn, selecting three faculty from each of the 27 subgroups identified. Sixty-three faculty interviews were conducted, and a follow-up survey was administered and completed by 46 faculty (73 percent). This paper will focus primarily on the findings from the faculty survey.

3. Findings

The primary research goal in this study is to understand differences between faculty perceptions of the value of small and large-scale technology projects. The results of this paper will focus on three major findings dealing with the value faculty perceive from completing a project, the frequency of faculty use of their projects, and how faculty are evaluating the impact of the projects on student learning.

3.1 Value versus cost to faculty

Participants answered several questions on the survey related to how they valued their projects. Questions dealt with (1) overall value versus expended effort, (2) faculty satisfaction with the project, and (3)

whether the project resulted in a time savings for the faculty member. The first question asked them to compare the value they received from completing a technology project with the time and effort they invested (see Figure 1). Ninety-two percent of faculty working on large scale projects felt that the value exceeded the effort expended compared to 71 percent of faculty working on small-scale projects. Interestingly, ratings for IS (29 percent) and TI (57 percent) were both significantly below the others.

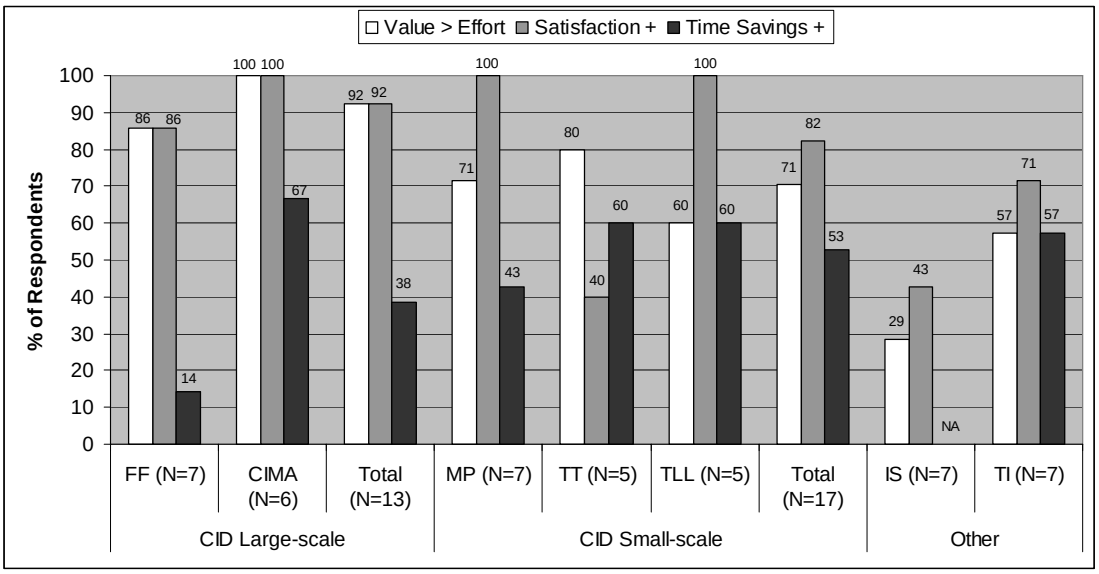

Figure 1. Faculty responses relating to their projects that value was greater than the effort (Value>Effort), positive satisfaction (Satisfaction+), and using the project in the classroom saved time (Time Savings+).

In addition to faculty perceiving greater value from large-scale projects, the overall satisfaction level was on average about 10 percent higher than small-scale projects (see Figure 1). Faculty in the Tech Training category were significantly less satisfied (by as much as 60 percent) with the outcome of their experience. In terms of faculty reporting that their projects saved them time, small-scale projects ranked higher than large-scale projects by 15 percent on average (see Figure 1). It is significant to note that Faculty Fellowship participants by far had the lowest score in this category, reporting that only 14 percent felt their projects saved them time (See Figure 1).

3.2 Frequency of project use

Another measure of the value of the project to faculty is how regularly they use the project in their classes. Faculty who completed large-scale projects had a tendency to use their projects much more frequently than faculty who completed small-scale projects (see Figure 2). On average, large-scale projects were used daily or weekly 69 percent of the time while small scale projects were only used daily or weekly only 24 percent of the time. Interestingly, 100 percent of technology innovators reported using their projects at least weekly. Another finding of interest is the large number of projects that have never been used. Fourteen percent of Faculty Fellows reported that they never used their projects and an average of 35 percent of faculty who completed small-scale projects reported that they never used the product or service provided by the CID.

3.3 Measuring impact on student learning

The last question on the survey looked at how faculty were measuring the impact of their project on student learning. They responded to the statement, “I know that my technology project has had an impact

on my student because…" by selecting one or more of the options provided. Seven options were grouped into the following three categories for reporting: (1) *direct measures* (some measurable form of data, or saw improvement in test scores or grades) [3], (2) *indirect measures* (students commented on the impact informally or in student evaluations or faculty perceptions of student impact) [3], and (3) *no measures* (no form of evaluation conducted or faculty expressed an uncertainty about impact). Figure 3 shows that indirect measures are the predominant way faculty are assessing the impact of their projects across all categories of projects. Faculty who completed small-scale projects were less likely (35 percentage points) than faculty who completed large-scale projects to conduct any form of evaluation and/or to be unsure about the impact of the project on student learning. Finally, technology innovators were 17 percent more likely than any other group to report that they had not conducted any evaluation and/or were unsure about the impact of their project.

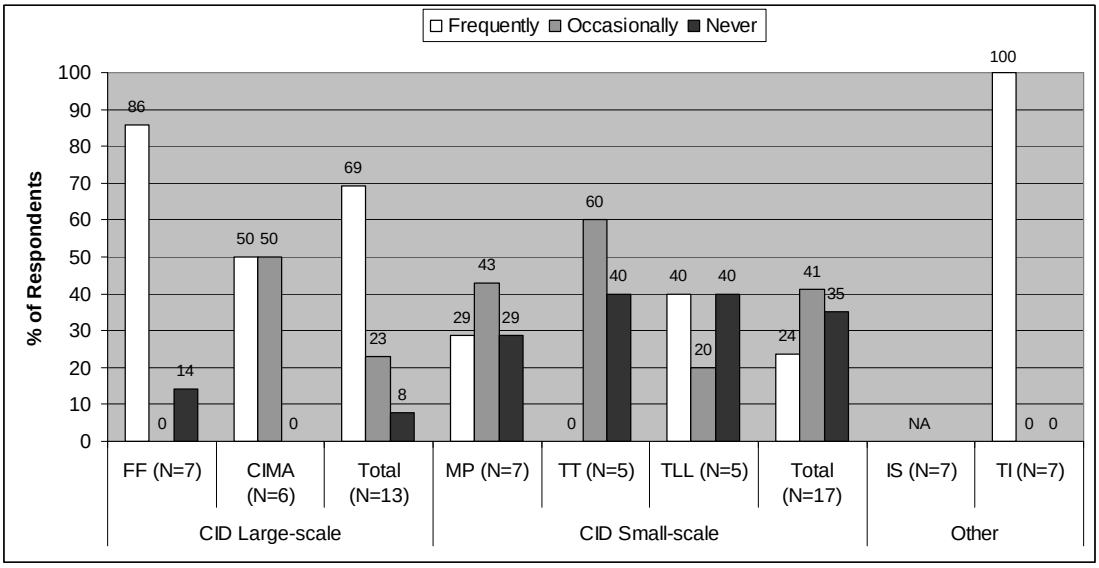

Figure 2. Faculty responses to how frequently the project is used in their classes. *Frequently* corresponds to a minimum of weekly use. *Occasionally* represents the range from several times a month to once a semester.

4. Discussion

What implications does this study have for faculty, administrators, and instructional designers? One of the major findings reported in this paper is that a minority of project implementations are currently collecting direct measures of their impact on student learning. There should be a greater emphasis on evaluating the impact of projects of all sizes on student learning at the CID. University organizations might facilitate this by making evaluation of project implementation and impact on learners a core part of their practice and by helping faculty plan and implement formal evaluations as part of their projects.

Much of the cost for the large-scale projects was shouldered by the institution facilitating projects that in many cases never could have been done by the faculty alone. The fact that large-scale projects were viewed by participants as having a higher value-to-cost ratio is understandable and doesn't undermine the importance of the small scale projects which were also viewed very favorably by faculty members. The small-scale projects tended to provide more time savings for the faculty, which may represent a focus of these smaller projects on productivity over pedagogy [4].

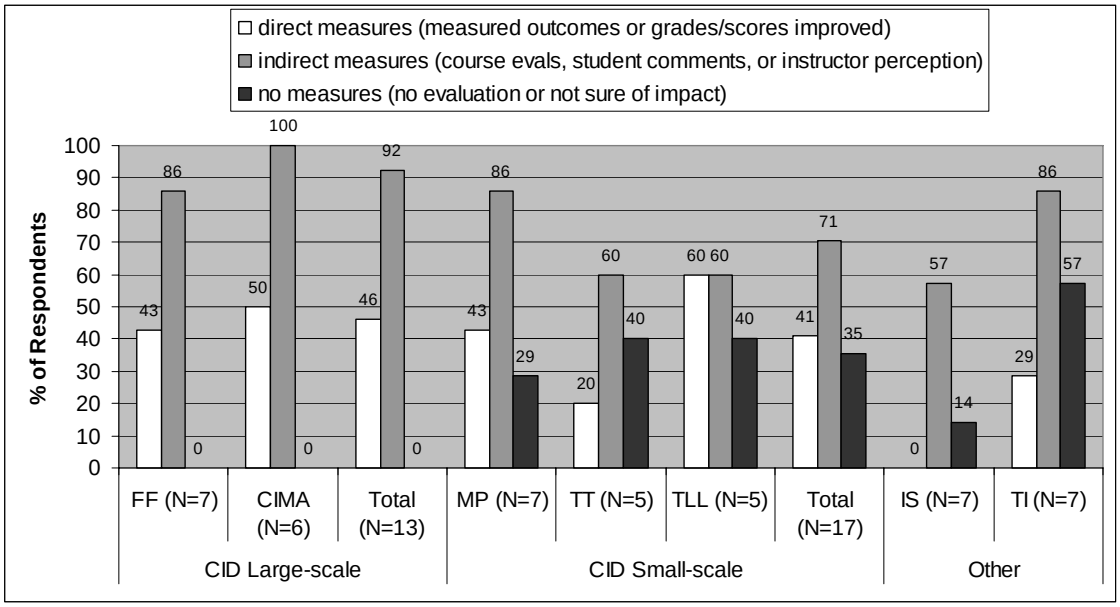

Figure 3. Faculty responses to how they know that their project has had an impact on their students.

There are far too many projects that were never used in the classroom (see Figure 2). We are still investigating this finding. It may be that when emphasis is given to the creation of products and evaluation of implementation is secondary, that some projects become inflexible and obsolete before they ever have the chance to be used in a classroom environment that is constantly evolving. Future research should focus on the how soon products are implemented after completion and how long they remain in use.

5. Conclusion

In this study we investigated faculty perceptions of the value and impact of their technology projects on student learning. Overall, faculty who completed large and small-scale projects reported positive experiences. Large-scale projects were perceived more often to be worth the effort expended and they were used more frequently in the classroom. While there was a lack of direct measures of impact recorded across all projects and particularly small-scale projects, most faculty used indirect measures to evaluate the impact on learners and reported positive outcomes.

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