The Collaborative for Teaching Innovation Report

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Christine Bachen, Nancy Cutler, & Eileen Elrod, Co-Directors
Santa Clara University
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Executive Summary

The Collaborative for Teaching Innovation, co-directed by Christine Bachen (Director of the Office of Assessment), Nancy Cutler (Director of Media Services), and Eileen Razzari-Elrod (Associate Provost for Faculty Development) has completed its second pilot year. It has continued to develop and support three key initiatives: The LEAD teaching and learning with iPads project, the Active Learning Classroom pilot project, and the ongoing programming, workshops, and Faculty Associates program to support faculty development, especially focused on enhanced teaching with technology. These initiatives have proved quite successful according to the multiple measures laid out in this report.

In 2013-14, the Collaborative was also involved in hosting faculty discussions about a possible teaching center, appropriate policy for online teaching, and classroom planning. Additionally, the Collaborative invited proposals for collaborative projects involving enhanced teaching with technology to be completed in 2014-15. It will fund seven projects, ranging from the development of videos to support a flipped classroom model in introductory biology to a project in computer science that will lead to a significant revision of the introductory courses to adopt new content and pedagogy to promote deeper learning and skill building across a diverse community of students. The Collaborative will also offer ongoing support to the recipients of grants for enhanced teaching with technology.

Additionally, in 2014-15, Collaborative co-directors and associates will work with the Provost’s Office to support the strategic initiatives related to a center for faculty development and teaching excellence, classroom renovation, and increased staffing to support technology-enhanced teaching. We will continue to reach out to other campus partners to develop new approaches and programs. Finally, we will build on our efforts to promote cross-disciplinary learning communities and to engage groups of faculty in pedagogical exploration that includes the meaningful incorporation of technology (e.g., by school, department, or shared interest area).
The LEAD Project: Using iPads to enhance teaching and learning

Introduction

The LEAD program (Leadership Excellence and Academic Development) at SCU is a four-year program for first generation college students focused on academics, community engagement, and service. In their first year, LEAD students take a two-quarter seminar dedicated to building community, strengthening personal development, and exploring leadership and career opportunities on campus and in the community. Students also enroll in designated sections of the Critical Thinking and Writing sequence. One week before the academic year begins the LEAD students participate in a week-long program to introduce them to the expectations of college courses and to the social and academic resources on campus. Since 2012-13, as a supplement to the successful high impact program, LEAD faculty and students have participated in a pilot project in which the use of mobile technology was intentionally incorporated into the LEAD courses.

The pilot has explored the challenges, benefits, and learning process involved for both faculty and students as they integrate mobile technology into their teaching and learning.

Research

In order to understand how the iPads were being used, we conducted periodic surveys with the LEAD students and surveys or interviews with the faculty.

<table>
<thead>
<tr>
<th>2012-13</th>
<th>2013-14</th>
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<tbody>
<tr>
<td><strong>Student Surveys/Interviews</strong></td>
<td><strong>Student Surveys/Interviews</strong></td>
</tr>
<tr>
<td>• Baseline online survey of first-year LEAD students on prior educational technology use. (September)</td>
<td>• Online survey of first-year LEAD students on use of the iPads in courses and outside of class, as well as measures of student engagement and the potential impact of the LEAD program. (January-February)</td>
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<tr>
<td>• Online survey on use of the iPads in courses and outside of class. (November)</td>
<td>• Online survey of second-year LEAD students on uses of the iPads, measures of student engagement, impact of LEAD program. (January-February)</td>
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<tr>
<td>• Online survey on use of the iPads in courses and outside of class. (February)</td>
<td>• Online survey of comparison group of first-generation students who did not participate in the LEAD program on use of the educational technology in courses and outside of class, as well as measures of student engagement and the potential impact of the LEAD program. (January-February)</td>
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<tr>
<td>• Subset of students interviewed about use of iPads. (Spring quarter)</td>
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Findings: Students’ use of the iPads

In 2012-13, when the LEAD students entered Santa Clara, they were already quite digitally connected and using basic educational technology to meet their educational goals. Nearly all had regular access to computers (92 percent) and phones with Internet browsing capabilities (73 percent). Only about 14 percent, however, had previous access to iPads. We did not repeat this measure in 2013-14, but it is reasonable to assume similar levels of access.

A resource for developing critical information processing and learning skills.

College students are called to engage with information more critically than when they were in high school. With the iPads, LEAD students had access to a set of note taking and annotation tools that helped them develop critical information processing and learning skills. On a six-point scale ranging from “extremely helpful” to “extremely unhelpful,” students rated the value of the iPad for their learning. The following chart shows the evolution of use for first-year students during the Fall and Winter quarters in 2012-13 and after just one quarter of use in Winter, 2013-14.

<table>
<thead>
<tr>
<th>Value of the iPads for</th>
<th>November 2012-13</th>
<th>February 2012-13</th>
<th>January 2013-14</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Very Helpful</td>
<td>Extremely Helpful</td>
<td>Very Helpful</td>
</tr>
<tr>
<td>Annotating texts</td>
<td>25</td>
<td>38</td>
<td>20</td>
</tr>
<tr>
<td>Notetaking</td>
<td>39</td>
<td>33</td>
<td>23</td>
</tr>
<tr>
<td>Taking photos of notes on board</td>
<td>35</td>
<td>43</td>
<td>22</td>
</tr>
<tr>
<td>Reviewing hand-outs</td>
<td>46</td>
<td>15</td>
<td>26</td>
</tr>
<tr>
<td>Brainstorming activities</td>
<td>23</td>
<td>13</td>
<td>23</td>
</tr>
<tr>
<td>Collaborative Writing</td>
<td>33</td>
<td>19</td>
<td>29</td>
</tr>
<tr>
<td>In-class research</td>
<td>45</td>
<td>41</td>
<td>34</td>
</tr>
<tr>
<td>Individual Writing</td>
<td>14</td>
<td>14</td>
<td>23</td>
</tr>
</tbody>
</table>
Several points are worth noting:

- Even after just one quarter, students acknowledged the benefits of the iPads in their learning (on most learning activities queried, more than half and as many as 80 percent of the students found the iPads “extremely” or “very helpful”).
- Students develop some of these skills over time and as they do, the value they ascribe to the activity increases.
- The iPad is particularly useful in support of note taking and hand-out review, annotation, and conducting in-class research.

**Communication**

Notably, the iPads allowed for easy access to email, a factor that seems to contribute to frequent staying in touch with faculty and peers. In 2013-14, 74% agree the iPad helps them stay in touch with professors, 77% with other students within LEAD, and 60% with other SCU students.

<table>
<thead>
<tr>
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<th>November 2012-13</th>
<th>February 2012-13</th>
<th>January 2013-14</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Very Helpful</td>
<td>Extremely Helpful</td>
<td></td>
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<tr>
<td></td>
<td>Email</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>27</td>
<td>60</td>
<td></td>
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<td></td>
<td>20</td>
<td>71</td>
<td>27</td>
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<td></td>
<td>27</td>
<td>67</td>
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**Pursuit of personal and vocational development**

In the LEAD seminars, students were introduced to various applications for helping them with planning (e.g., a calendar), exploring vocation, and tracking health and nutrition (only introduced in the seminar in 2012-13). While this use of the iPad was not consistent across all quarters or years, about half the students rated found the applications personally helpful.

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<tbody>
<tr>
<td></td>
<td>Very Helpful</td>
<td>Extremely Helpful</td>
<td></td>
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<tr>
<td></td>
<td>Managing time</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(e.g., calendar due dates)</td>
<td>33</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Tracking health and nutrition</td>
<td>34</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>IStart Strong Assessment</td>
<td>24</td>
<td>26</td>
</tr>
</tbody>
</table>
In their own words

We were interested in hearing directly from students about their experiences with the iPads. We included several open-ended questions in the survey about ways in which iPads were useful in their LEAD classes and in other classes, and any recommendations to improve the way they were integrated into their classes.

Value of iPads in LEAD classes

Students’ responses about the value of the iPads in their LEAD classes reinforce and extend the results reported above, making clear that the iPads are being used in a versatile manner and are a tool for independent learning and collaborative learning. Representative comments over the two years include:

<table>
<thead>
<tr>
<th>I liked taking notes and using it to collaborate with my classmates.</th>
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<tbody>
<tr>
<td>Being able to use iPads to bring relevant information to discussion.</td>
</tr>
<tr>
<td>The note-taking app Notability is useful because it lets me annotate essays and write up ideas. Also the mobility of the iPad in general is very useful, can take it anywhere for information on the go.</td>
</tr>
<tr>
<td>Being able to project our notes onto the boards for other students to see and correct. Being able to take notes and insert pictures of the board or slides so easily. Being able to send the notes or essays that need to be peer reviewed. Being able to follow along with the professor on the iPad and being able to access the same site. Being able to do research in class and work on collaborative work.</td>
</tr>
<tr>
<td>I liked being able to follow along with class presentations on the iPad.</td>
</tr>
<tr>
<td>It has been very useful when doing my assignments for LEAD CTW because I can be writing my assignment while I look back to my annotations and have access to search the web to better understand the assignment.</td>
</tr>
</tbody>
</table>
Value of iPads beyond LEAD classes

The responses to another question reveal that students made use of the iPads to facilitate organizing their time and for their learning in classes beyond CTW and their LEAD seminar. A number of the students emphasized the portability and multiple functions of the iPad, and even the value of the iPad in support of sustainability. Typical comments include:

<table>
<thead>
<tr>
<th>The Calendar app really helped inside and outside of class by keeping me on track with what I had to do. It helped me prioritize.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The instant email access. Also the calendar and photo and video features helped in my other classes for note taking.</td>
</tr>
<tr>
<td>I used my iPad to take notes in Physics to save paper. It works quite well in that I can customize my notes without having to use colored pencils/pens and just switch colors in Notability.</td>
</tr>
<tr>
<td>[The iPad] gave me a device where I can take really organized notes and start on work immediately. It’s not so heavy so I am not making the choice of what to take and what to leave behind as much. It enabled me to be able to stay organized and check on assignments quickly to be able to plan out my day or week, or even the quarter.</td>
</tr>
<tr>
<td>iPad is useful] to email professors, look at the work that was assigned and use programs to help me with my homework.</td>
</tr>
<tr>
<td>It made reading somewhat fun now. I could annotate by just touching the screen.</td>
</tr>
</tbody>
</table>

Student Recommendations for iPad Use

Over the past two years, most students expressed satisfaction with the way the iPads were used in their LEAD courses. Some asked for more opportunities to integrate them into class and to learn to use them in new ways. One noted, “I’d like to see the iPad being more integrated into the class. I’d like it if the students were taught the full capabilities of iPad so that we can maximize its use in and outside of the classroom” (2012-13). In 2013-14, one student suggested greater use of its “research capabilities,” while another suggested use in “more original ways” and that it be “incorporated in more engaging manners than projects.”

In both years, some students directly asserted that the iPads sometimes are a distraction. However, we saw the number of students agreeing with the statement, “The iPad is often a distraction in class” decline between 2012-13 and 2013-14. In 2012-13, 24 percent agreed “a little” with this statement and 19 percent “somewhat agreed, and 3 percent “strongly agreed.” In 2013-14, about one-third in all (13% fewer than 2012-13) agreed that the iPad is often a distraction in class suggesting the faculty and/or the students are learning how to minimize the more distracting uses through restrictions on their use or internalizing new norms.

Many students express an eagerness to further develop their skills with the iPad, including developing proficiency with iMovie, cloud storage apps for backing up information, note taking,
presentation skills, organizational tools, and an app called “Explain Everything” that allows users to easily create video presentations.

Comparing Across Groups: First-year LEAD Scholars compared to their counterparts

We compared 49 LEAD scholars and 35 first-generation/first-year students. Significant differences were found between the two groups on a number of their perceptions about the role of educational technology in their learning at SCU. The table below shows that the LEAD scholars were much more likely to strongly agree (on a 4-point scale) that educational technology had benefited their learning experience.

<table>
<thead>
<tr>
<th>Question</th>
<th>January 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Role of educational technology in learning at SCU</td>
<td>LEAD Non-LEAD</td>
</tr>
<tr>
<td>Made it easier to work with other students</td>
<td>3.45 3.00</td>
</tr>
<tr>
<td>Helped me complete assignments on time</td>
<td>3.49 3.09</td>
</tr>
<tr>
<td>Helped me be more efficient with my studies</td>
<td>3.35 2.97</td>
</tr>
<tr>
<td>Ed tech has helped me learn</td>
<td>3.57 3.15</td>
</tr>
<tr>
<td>Advantages of ed tech outweigh disadvantages</td>
<td>3.52 3.00</td>
</tr>
<tr>
<td>Ed tech has made my education more affordable</td>
<td>3.21 2.77</td>
</tr>
<tr>
<td>Access to the Internet in class helped me learn class material</td>
<td>3.38 3.00</td>
</tr>
<tr>
<td>Able to engage in vocational exploration using ed tech</td>
<td>3.24 2.90</td>
</tr>
<tr>
<td>Helped me succeed in my coursework</td>
<td>3.35 3.06a</td>
</tr>
</tbody>
</table>

Note: All differences except the last item are significant at the .05 level or lower. Superscript ‘a’ indicates a probability level of .06.

There were, however, no significant differences between the groups on their frequency of using the web to read the national news, look up information on their own related to a class, learn something they were curious about, or frequency of Facebook use.

The iPads from a faculty perspective

Six faculty members in 2012-13 and seven faculty in 2013-14 were engaged in the iPad pilot, teaching either CTW or the LEAD seminar. In 2013-14 five of the seven were faculty who taught in CTW or LEAD seminar the year before. Initially, no faculty had experience teaching with the iPads, so they too faced a learning curve and engaged in considerable exploration of the iPad and its relevant applications for learning.
For the most part, the faculty’s sense of how the iPads had engaged students echoed the students’ observations. In 2012-13, one faculty member noted, “I think it was particularly useful for the iStart Strong Inventory. Students were able to easily access the many links to their results and thus go deeper in their research on interests and potential careers....” Another saw the iPad particularly helpful for peer review: “... from my observations, students seem to read and comment much more than if they read a hard copy of an essay. That sounds bizarre, but being able to make notes in the margins using one of the apps ‘makes it kind of fun,’ to quote a student. [In addition] [R]esearching an idea or a question in the middle of a discussion, which leads to discussions about evaluating sources.” This last comment underscores the multiple learning opportunities afforded by the iPad—in this case, an “on the spot” lesson about critically assessing sources.

Using the iPad to connect in class with the Learning Management System offered more opportunities for communication and collaboration. One appreciated that iPads afforded students a level technological playing field: “[I] liked that all students had the iPad, there was never a question of what they could/couldn’t do in class because everyone had the same equipment. In other classes, students had devices—either phones or laptops but maybe not all of them and devices could be more limited.”

In 2013-14, the CTW faculty collaborated on the design of new projects for which the iPad were used, including a short multi-media presentation of a common grammatical error (using the application, “Explain Everything”), a group-produced an iMovie on the life of a subject of a biography, and students used their iPads in their presentations at the LEAD scholars symposium. The iPads were also used in class for looking up research, annotating and note-taking, sharing out of student work, and in more limited ways, collaboration. LEAD Seminar faculty asked students to use the iPads to explore vocation, complete surveys, and to explore some uses of the calendar and other apps for organizing their work and personal lives.

Faculty reflected on “lessons learned” over the course of the two years. Because all students had iPads, the faculty were able to build a variety of learning activities into the courses knowing that all students would have access to the Internet and relevant applications. Faculty observed that students gained proficiency and depth in their ability to critically read and annotate texts, and enjoyed the “anytime,” “anywhere” ability to read and write on the iPad. Some students shared that having an iPad as part of their LEAD experience made them feel quite special and that it opened up conversations with other students about the LEAD program. The iPads were not the only tool many students used, however. Especially, in year two of the project, the second quarter faculty noted that some students were bringing laptops to class rather than the iPad.

Even as the faculty developed new assignments that drew on the features of the iPad, they considered whether and how student learning benefited beyond what they had been doing in other formats, especially when students had to develop new, often time-consuming skills (e.g., working with iMovie). And while the faculty were more familiar with the iPads in year two, a
new learning management system was implemented posing another learning curve for faculty and students.

Conclusion

The research to date on the iPad LEAD project shows that students have embraced the educational applications of the iPads and used them to enhance their course-based learning and to develop a set of essential skills that promote deep learning (learning that emphasizes critical analysis of ideas, linkages across concepts and learning experiences, leading to understanding and long-term retention of concepts). The comparison of current LEAD students with a comparison group of other first generational college students underscores the important role the iPad has played in facilitating collaborative work and learning

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1 Students from the Senior Capstone for Applied Sociology, in conjunction with Professor Laura Nichols, led this research effort which also included resurveying second-year LEAD students (who had received iPads during their first year) and a comparison group of first generation college students (including first and second year students) who were not part of the LEAD program. This allowed three other comparisons: 1) a comparison between first-year LEAD students who had received iPads and similar students who had not received iPads; 2) a comparison of second-year LEAD students with a similar cohort; and 3) a comparison of the 2012-13 with 2013-14 LEAD cohorts. This report includes the comparison of first year LEAD scholars and their non-LEAD counterparts
Introduction

Research demonstrates the importance of active learning pedagogies on student learning. Educational experiences that include activities such as discussion, project-based work, and analysis in groups promote engaged, self-motivated, and higher performing learners. A 2014 meta-analysis (Freeman et al., 2014) of 225 studies of student learning in the STEM areas found that active learning increased student performance by about 6 percent on exam scores and concept inventories. Interestingly, active learning also lowered the failure rate as measured by students withdrawing from the course or receiving a grade of D or F.

Active learning pedagogies are facilitated by classroom spaces which offer flexibility to reconfigure the classroom and move students easily into groups, where students can display their work, and reorient the relationship between students and instructor, and among students themselves (University of Minnesota Active Classroom project). In these types of classrooms, students report a higher level of engagement in the learning process and achieve enhanced learning outcomes.

The Santa Clara pilot active learning classrooms

Three active learning classrooms were designed in the summer of 2012: Varsi 114, Graham 163 and Graham 164. In 2013, three additional classrooms were redesigned: Alumni Science 220, Engineering 602, and O'Connor 204. Features of these classrooms include moveable desks or tables, smart boards, writeable walls, and multiple projection display screens.

Faculty and students in those classrooms were surveyed during fall or winter quarter (2012-13 and 2013-14) to determine the perceived impact of the classroom on active participation, connections among faculty and students, the promotion of new and transferrable ways of thinking, the types of learning activities taking place in the classroom, the perceived benefits of specific classroom features, and generally, what worked well and what didn’t. Many of the survey items were taken from a survey developed at the University of Minnesota, allowing us to compare our findings with this (and other) institutions that have engaged in multi-year research projects that include comparisons between “traditional” and “active” classrooms.

The survey responses demonstrate that students perceived the new classrooms to support the types of learning and engagement typical of active learning environments. These responses parallel those from other institutions with redesigned classrooms.
Percent of students agreeing that the classroom:

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<th>2012-13</th>
<th>2013-14</th>
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<tbody>
<tr>
<td>Facilitates multiple types of learning activities</td>
<td>87%</td>
<td>86%</td>
</tr>
<tr>
<td>Promotes discussion</td>
<td>85%</td>
<td>83%</td>
</tr>
<tr>
<td>Encourages my active participation</td>
<td>73%</td>
<td>73%</td>
</tr>
<tr>
<td>Enriches my learning experience</td>
<td>74%</td>
<td>73%</td>
</tr>
<tr>
<td>Encourages me to create or generate new ideas, projects or ways of understanding</td>
<td>69%</td>
<td>63%</td>
</tr>
<tr>
<td>Helps me develop connections with my classmates</td>
<td>75%</td>
<td>74%</td>
</tr>
<tr>
<td>Helps me communicate effectively</td>
<td>73%</td>
<td>80%</td>
</tr>
<tr>
<td>Helps me develop connections with my instructor</td>
<td>67%</td>
<td>67%</td>
</tr>
</tbody>
</table>

In their surveys, faculty responded similarly to the students, generally finding the classroom design and affordances promoted more active participation, enhanced student learning, and communication. Many of their teaching practices aligned with their perceptions: In both years, with a frequency of once a week or more, just over two-thirds had students working in small groups or on an in-class learning activity; 55 percent in 2012-13 had an in-class learning activity that required students to explain course ideas or concepts to others and that number rose to 70 percent in 2013-14; and approximately two-thirds percent of faculty consulted with groups of students during an in-class activity.

Students’ and faculty’s open-ended comments point to the flexibility of the classrooms and the way in which they facilitate interaction. However, they also identify some perceived limitations in the classrooms, either because of design, technology performance, or because of lack of usage of the classrooms’ affordances, underscoring the value of the pilot as a learning experience for the university.

The moveable desks in Varsi allow for easier interaction and access to visual displays of information, factors that enable a variety of active learning practices.

[The room works well] when we are discussing in small groups. When we want the screens to project a website, a presentation, a student’s work, an assignment, or anything...
(Student in Varsi 114, 2012-13)

I like the flexibility of the tables and chairs. It was easy to shift them around depending on our needs. I also liked the various screens so that students could sit in small groups and see the screens from various locations. I also really liked that the technology was readily available and easy to use. (Faculty in Varsi, 114, 2012-13)
The importance of sufficient space in a classroom, as well as natural light, was frequently noted as a feature of the Graham classrooms.

In 2013-14, wall paint was a new feature used in all three of the classrooms. While the implementation had some problems (adequate time to cure, cleaning tools), the greater writing surface areas and the multiple projectors, combined with moveable chairs/desks allowed for active engagement of many students and collaborative work.

I loved that it had a lot of natural light-helped to keep me energized and in a generally positive mood. I like how big and open it was and the new equipment accommodated different learning styles. (Student in Graham 163/164, 2012-13)

Moving from lecture to small group discussions and then to full class discussions was easy with the rolling chairs. The chairs also allowed us to easily make a large circle for discussions. (Student in Graham 163/164, 2012-13)

The wide space in the room, compared to other cramped classrooms, allows for more mobility and freedom and made me more comfortable with my surroundings. (Student in Graham 163/164, 2013-14)

We would often break off into our quarter-long groups so the swivel chairs made this very easy to go in and out of whole class discussions and group discussions. Also it was nice to be able to write on all four walls. This helped for presenting group work to the rest of the class. (Student in O’Connor 204, 2013-14)

Excellent for generating ideas and promoting many other kinds of creative learning opportunities. My students loved it and were very eager to engage in all kinds of writing activities from individual to large group, and were more enthusiastic than in standard classrooms to present and discuss their work with others. They also told me they liked the rolling chairs, which made it easy for them to change group configurations readily. (Faculty, O’Connor 204, 2013-14)
Using the wall paint, we were able to write problems and examples on the walls to more effectively learn the material. (Student in Engineering 602, 2013-14)

As much as the node chairs promoted functionality and ease of transporting and transitioning between individual and group activities, the size of the desks made both classwork and tests very difficult. (Student in Engineering 602, 2013-14)

[The room works well when] using slides and board at the same time ... I use combination of writing on board and projecting different slides ... being able to write on the wall while slides are presented helps me a lot ... I also benefit a lot through writing on slides making it more clear for students. (Faculty, Engineering 602, 2013-14)

Visually stimulating. The bold colors of the chairs, tables, and walls encouraged me to think. (Student in Alumni Science 220, 2013-14)

I like the layout and most of the special features. I like that the chairs are colorful. It adds to the learning environment and makes the room inviting, especially in the early mornings. (Student in Alumni Science 220, 2013-14)

Taken as a whole, student and faculty comments are a clear reminder that not everyone experiences all the features in the classrooms the same way. For some, the desks are “too small.” For others, the “chairs are always out of order and are not comfortable.” Some failed to see the benefits of certain classroom features for their learning: “The huddle boards were completely useless for our class.” Others questioned the “fit” of the classroom for the type of learning experience of the class: “It was an interesting classroom although it may not have been the best choice for the class I was in.” Some felt their renovated classroom was not really very different from others at the university and questioned the expense involved in renovation.

Furthermore, in 2013-14, the assessments made for Varsi 114, the Graham classrooms, and O’Connor 204 by faculty and students were more positive than those for Engineering 602 and Alumni Science 220, reminding us of the learning curve in trying something new and the importance of proper implementation. The writeable walls in both of these classrooms were not easily cleaned and their surface provided too much glare when an images or text were projected on them. This was a significant distraction for students and faculty. The furniture in Alumni Science 220 was not easily reconfigurable (partially due to limited maneuvering space), diminishing that benefit of the room. Some additional problems with the A/V facilities and IT
were identified, along with a problem with temperature control in one of the rooms. However, the limitations identified for these rooms, as noted above many faculty and students see potential for the features of these classrooms.

Conclusion

Through our surveys and conversations with faculty, it is clear that the classroom environment can and does contribute positively to the teaching and learning experience.

We have learned that active classrooms:

- Are energizing for students and faculty
- Encourage faculty to make changes in their teaching practices
- Allow students to experience the class material in multiple ways
- Encourage students to develop and reinforce important competencies like oral communication or teamwork

Going forward, Faculty Development and the Collaborative for Teaching Innovation will continue to support faculty who are interested in developing more collaborative, small-group, and inquiry-based activities. Media Services and the Instructional Technology Resource Specialists and classroom support staff will offer more workshops and one-on-one demonstrations to help the faculty make the most out of the technological affordances of the classrooms. The university will work on effective ways to ensure that there is the right fit between the teaching preferences of faculty and the features of a given classroom, and that there is a timely resolution of IT or facility problems.
Faculty Development: Enhancing Teaching with Technology

During 2013-14, the Collaborative continued three initiatives to support and promote faculty development in teaching with technology, including the Faculty Associates Program, Varsi CAFÉ lunchtime discussions, and Faculty Summer Technology seminars and workshops.

In addition, members of the Collaborative were involved in the ongoing discussions and planning of redesigned active classrooms. Co-directors Eileen Elrod, Chris Bachen, and Nancy Cutler ran a campus event to gather information about perceived needs for a new teaching/professional development center for faculty and participated in the drafting of three components for the Strategic Plan for a center, redesigned classrooms and classroom technology, and additional staffing to address the growing need for support in developing blended and online teaching materials. Along with Phyllis Brown and Andrea Brewster, they also presented at AAC&U’s Network for Academic Renewal conference in Portland in February on “The Strength of the Dotted Line: Partnerships that Enable Organizational and Curricular Innovation.” Finally, the Collaborative invited proposals for collaborative projects involving enhanced teaching with technology for 2014-15 and will fund seven projects, ranging from the development of videos to support a flipped classroom model in introductory biology, giving faculty more class time to work on application and problem solving with students, to a project that will lead to a significant revision of the introductory courses in computer science to adopt new content and pedagogy to promote deeper learning and skill building across a wide variety of students.

The Faculty Associates Program

Four new faculty associates—Stephen Carroll, Pedro Hernández-Ramos, Michael Kevane, Tonya Nilsson—joined the Collaborative in 2013-14. Along with continuing Associates, Nicholas Tran and Tim Urdan, they worked together with co-directors Eileen Elrod, Associate Vice Provost for Faculty Development, Christine Bachen, Director of Assessment, and Nancy Cutler, Director of Media Services to help develop and support faculty development in excellence and innovation in teaching. Each associate contributed to programming and/or identified an area of technology-enhanced teaching in which to engage other faculty in dialogue and exploration. Associates’ contributions and programs are summarized below.

**Stephen Carroll**, Senior Lecturer in the English Department in the College of Arts and Sciences. Stephen worked on the conceptualization and development of a new digital resource on teaching, called DRT, helped define the template for new entries, and drafted a number of entries. Stephen was a presenter in and organizer of a number of Varsi CAFÉs. He presented “MetaLearning: Enhancing Life-Long Success by Teaching Students to Become Self-Directed Learners” at the Mazatlan Forum for Cross Border Collaboration in March.

**Pedro Hernández-Ramos**, Associate Professor of Education in the School of Education and Counseling Psychology. Pedro engaged in research and drafting of a whitepaper that lays out a viable and sustainable strategy for online/hybrid course and program development at SCU,
building on the most recent experiences with CADE through JesuitNet (2012-2013 and 2013-2014) and best practices nationally. The report identifies and articulates the opportunities, challenges, issues, and resources related to online/hybrid teaching and learning at SCU, including the connections to administrative back-end systems (registration, payment) and ancillary services for online students (advising, library resources, remedial needs, etc.). He presented at the New Faculty Orientation Teaching workshop, participated in several Varsi CAFÉs throughout the year, and served as a co-leader for the three 2013-14 Summer Faculty Seminars on Enhanced Teaching with Technology. He offered support and help to faculty colleagues in the LEAD seminar working on integration of iPads and online resources (Camino/Canvas) into the seminars. Pedro was one of the principal planners and facilitators in the Mazátaín Forum for Cross Border Collaboration on the theme of “Technology and the Future(s) of Education: U.S. and Mexican Perspectives.”

**Michael Kevane**, Professor of Economics in the Leavey School of Business. Michael developed and assessed peer evaluation systems for small group work in classroom, in order to effectively flip classroom activities. He also is coordinating a faculty interest group (in which 41 faculty expressed interest) with the goals of improving statistical computing teaching and using the “R” statistical analysis software. Michael is developing materials for faculty about how R can be used in class, and is also working on a prototype rubric for learning outcomes from statistical computing (i.e. what do we want students to learn when using software - different from underlying concepts). Michael also presented multiple times at the Varsi CAFÉ.

**Tonya Nilsson**, Lecturer in Civil Engineering in the School of Engineering. Tonya took a leadership role in the planning and facilitation of the Varsi CAFÉ, where she has also been a presenter. She has led sessions on Backward Design, among other topics, at New Faculty Orientation workshops and to other groups on campus. In the summer of 2014, she coordinated a workshop for Engineering Faculty on course redesign that included but went beyond the Summer 2014 Faculty Seminars on Enhanced Teaching with Technology.

**Nicholas Tran**, Associate Professor in the Mathematics and Computer Science Department. Extending his work from 2012-13 on developing portable electronic content development for Engineering and Computer Sciences, worked with a team of faculty to get started and make significant progress on developing their multimedia, interactive e-books for touch-screen devices. Nicholas and some of the faculty with whom he worked presented some of their content and insights about working with e-books at a Varsi CAFÉ. Nicholas also presented “Rethinking Keyboard Design for Touch-screen Devices” at the Mazátaín Forum: Platform for Cross-Border Collaboration in March.

**Tim Urdan**, Professor in the Psychology Department and Liberal Studies Program. Building on his faculty interest group from the previous year, Tim worked with a smaller, more intensive working group to develop modules that can be delivered online as part of a flipped or hybrid course. Tim also contributed to other faculty development projects, serving as a New Faculty Coordinator focused on tenure-stream colleagues, helping to facilitate the New Faculty Spring retreat, being part of a teaching consultant team that offers developmental observation, student
interviews and assessment of teaching to interested SCU faculty. He participated in the Varsi CAFÉ, New Faculty Orientation sessions on teaching with technology, and co-led the three Summer 2014 Faculty Seminars on Teaching with Technology. Tim presented “What do I do now?” Using In-Class Time Differently in Flipped Classrooms” at the Mazátlan Forum: Platform for Cross-Border Collaboration in March.

The Varsi CAFE

The Collaborative for Teaching Innovation and the Faculty Development Program continued with its successful lunchtime series focused on faculty experimentation with new technologies and new forms of active and collaborative learning. Each session—developed, promoted and hosted by the Collaborative team—involved one or more faculty members sharing their experiences in supporting student learning in innovative ways. Sessions were often held in one of the pilot classrooms where participants were able to experience the affordances of the new teaching spaces that enable more active and collaborative forms of teaching.

Session Topics for 2013-14 included the following.

Fall Quarter:

- September 25 and 27: How Canvas Helps me Teach the Way I Want to Teach.
- October 2: Did They Learn It? Rubrics and in-class tools to help faculty teach and students learn.
- October 14: Join one or both workshops with Director of Learning at Apple Computer and longtime faculty member at Abilene Christian University, Dr. Bill Rankin. 1) Designing teaching activities that address real world problems in your courses. 2) New technologies, new participants, new audiences.
- October 21: Open Access Publishing (process, benefits, concerns) and faculty impact. (Plus a brief Introduction to Scholar Commons, SCU’s permanent open-access repository.
- October 22: The Rare, The Medium-Rare, and The Well-Done: Thinking about Books, Microchips, and Libraries. What is the future of the book in the digital age? What might the book as a material artifact have to teach scholars and students across the disciplines? Join Dr. Michael Suarez, S.J., Director of Rare Book School and Professor of English at U of Virginia for this presentation. Co-sponsored with the English Department and the Library for Open Access Week.
- November 6: Mix it up: Enriching Course Content, Engaging Learning
- November 20: Mining MOOCs.
- December 3: Gardner Campbell (Vice Provost for Learning Innovation and Student Success, Virginia Commonwealth): What’s learning got to do with technology? What’s technology got to do with learning?
Winter Quarter:

- January 7: Things I Figured Out in Canvas last quarter: Learn more about what your colleagues are doing in their courses. Bring your questions, discoveries and frustrations for this discussion and Q&A session.
- January 28: Designing Effective Writing Assignments (Co-sponsored by The HUB Writing Center, The Faculty Collaborative, and Faculty Development.)
- February 6: Developing Activities to Deepen Student Learning: In-Class Strategies and Examples.
- February 11: Evaluating Student Writing: Using Rubrics to Give Feedback. (Co-sponsored by The HUB Writing Center, The Faculty Collaborative, and Faculty Development.
- February 20: Teaching with Problem Sets and Problem Solving: Enhancing Students’ Critical Thinking.
- March 4: Visualizing and Presenting Data for Humanities and Social Sciences: Tools for Faculty and Students.
- March 18: Open House and Ideas for Spring quarter.

Spring Quarter:

- April 2 & 3: Camino: Beyond the Basics: Examples and Ideas
- April 9: Effective Discussions: Beyond "What do you think?" and "Any Questions?"
- April 15: Good Groups: Facilitating In-Class Group Work and Group Assignments
- April 23: What Does it Mean to Learn Something?
- April 29: Online Content, In-Class Activities and Student Learning
- May 2: Online Content, In-Class Activities, and Student Learning
- May 8: Electronic Portfolios and Student Learning
- May 14: Teaching and Learning with E-Books

The Summer Technology Seminars and Workshops

Based on positive feedback from the 2012-13 pilot/redesign Seminar on Teaching and Technology, the Collaborative continued with the model of a two-day seminar (offered three times during the summer) focused on the key concept of backward design in course development and strategies for active learning, engagement, collaboration, and assessment, and demonstrated the roles technology can play in enhancing learning. The seminars were lead by two Faculty Associates in the Collaborative (Pedro Hernández-Ramos and Tim Urdan), and were supported by Nancy Cutler and the Instructional Technology Resource Specialists (ITRS). In addition to the Seminar, three Hands-On Workshops on various learning technologies for creating content, for redesigning student assignment, and digital video were offered multiple times throughout the summer by the ITRS.
The workshops, scheduled throughout the summer, have been quite well attended. This summer, through either the seminars or the workshops, approximately 90 individual faculty (up from 76 last summer) will participate in these learning opportunities in support of innovative teaching and enhancing teaching with technology (and many faculty signed up for more than one seminar or workshop). Faculty feedback on these programs has been very positive. Faculty also identified areas for future workshops and programming. Some illustrative comments from the two-day seminars regarding learning gains and overall experiences in the summary include:

- I liked the small group environment. I liked that the class paused to let us transfer what we learned to our own classes.
- I loved the new ideas and the time to explore them and exchange with others. I really valued the exchange with colleagues-lots of new ideas, also realizing that I am not alone. I found new ways to think about things, which is what I hoped for when I signed up. I learned about a lot of possible technology tools, but as is so often the case with limited time workshops, I did not have the opportunity to try them and really understand them. In the past this has meant that ultimately I get fearful and don’t ever use them. I will try not to let that happen this time.
- Practical tips on tech tools to use - explanation of the conceptual frameworks on learning, motivation, etc.; Most academics (including myself) never get any training in pedagogy
- The ability to create meaningful interactions in the classroom continues to be an important area of learning for me. This was modeled well by the presenters and the tools delivered were very helpful.
- Focusing on research about learning -- it was very useful to have summaries of research to back up some of the methods I already use and to think about how I can improve my teaching. I ended up buying both of the recommended books so I can keep learning about learning.
- I really enjoyed/gained a lot from the idea on student motivation. I liked hearing and discussing with my peers what role instructors play in motivating students.

CADE (Competency Assessment in Distributed Education)

CADE is an approach to preparing faculty to teach online, developed through JesuitNet and used by variety of Jesuit institutions. The University contracted with JesuitNet’s CADE program to assist with a significant curriculum redesign project to support targeted groups of faculty in developing online degree programs and online summer session courses.

Twenty six faculty members completed the CADE training in 2013-14. (SCU requires that faculty complete University-sponsored preparation prior to teaching online.) They included faculty from the Schools of Business, Engineering, the Jesuit School of Theology, and a wide variety of departments in the College of Arts in Sciences to develop summer schools courses. And a faculty from the Graduate Program in Pastoral Ministries who developed curricula for the online/hybrid MA degree for deacons and Hispanic lay ministers that will complement the on-campus MA program. Feedback continues to be very positive for the program, including the backward design
to course development, the mindful integration of Ignatian values into course pedagogy, and the ongoing support and mentoring offered in the program. We have heard the calls for more local sources of support, however, and hope to be able to provide in-house support for faculty development in online and hybrid teaching with the hire of an instructional designer for online course development.

Each faculty member works with an instructional designer to map out (or re-map) and construct one course. CADE uses a “backward design” model, where the instructor first considers the desired or resultant competencies and works back from that point. Integrated into the process of re-design is reflection on vocation of the teacher. The result is a highly interactive online course, one that provokes reflection on learning by the student. The on-line threaded discussion component can also be integrated into traditional, face-to-face courses.

Conclusion

Collectively, the faculty development efforts related to technology-enhanced teaching have been enthusiastically received. With a focus on pedagogy that supports engaged and active teaching and learning, each effort has explored how technology applications can further our goals for innovative and excellent teaching. Through assessment we have continued to learn how we can improve our programming and we have used the assessment results to retool and make changes along the way. In addition, these assessments are guiding future planning of our most intensive programs, particularly the Summer Technology Seminars/Workshops and the CADE program. The Faculty Associates Program will include five Associates in 2014-15 with associates representing the schools of Arts and Sciences, Business, Engineering, and Education and Counseling Psychology.

Over this past year, we have increasing evidence that:

1. Faculty are eager to engage in ongoing innovation and improvement of their pedagogical practices. Having a clear understanding of one’s learning goals and outcomes is essential; with this clear foundation, the technology tools that provide meaningful ways to achieve them can be explored and integrated.
2. Students recognize the value of technology tools in pursuit of their educational goals and in the development of learning communities. Their use is shaped by the ways in which they learn about the technology’s affordances by faculty and peers, in addition to their own explorations.
3. Both faculty and students value an active learning environment in which faculty and students interact with one another easily and collaboratively. Sometimes this requires nothing more than moveable chairs and tables. However, technology that enables the collaboration on and sharing out of the work products is also an asset.
4. Formative and summative assessment of changes we make to the learning environment through physical changes such as new classroom spaces, fundamental changes in course
design, or technology enhanced teaching helps faculty better understand what’s essential for effective teaching and learning and helps the university plan appropriately for the future. In addition, Santa Clara University is contributing to the larger national conversation on the scholarship of teaching and learning through its research inquiries.

5. Collaborative planning and program design (working across traditional units) results in effective and appealing faculty programs that address faculty needs and interests and draw on expertise and experience of staff and faculty in particularly useful ways.

Directions for the Collaborative in 2014-15

The Collaborative will continue to support its three key initiatives: The LEAD teaching and learning with iPad project, the Active Learning Classroom pilot project, and the ongoing programming and workshops to support faculty development, including the Faculty Associates program. In addition, during 2014-15, we will offer ongoing support to the recipients of grants for enhanced teaching with technology. We will work with the Provost’s Office to support the strategic initiatives related to a center for faculty development and teaching excellence, classroom renovation, and increased staffing to support technology-enhanced teaching. We will continue to reach out to other campus partners to develop new approaches and programs. Finally, we will build on our efforts to promote cross-disciplinary learning communities and to engage groups of faculty in pedagogical exploration that includes the meaningful incorporation of technology (e.g., by school, department, or shared interest area).