

Faculty Use of iPads and Engagement in the Higher Education Classroom

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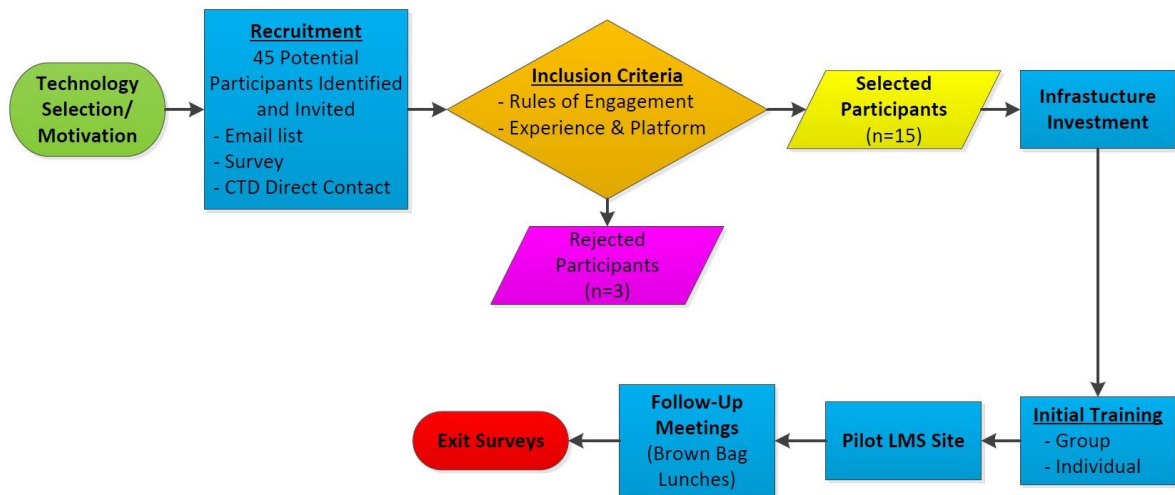
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Abstract

Improving the undergraduate experience and enhancing learning are two major objectives for UC San Diego and part of the mission of Academic Computing & Media Services (ACMS). In an effort to support faculty in making lectures more engaging, ACMS launched a pilot project that provided iPads to selected faculty to assess the educational value of these devices in the higher education classroom. This report documents how ACMS prepared faculty and general assignment classrooms to use iPads during lectures. The iPads were deployed across a variety of academic fields and class sizes. Periodic group meetings allowed ACMS to check in with faculty participants to suggest new techniques and allow participants to share successes and challenges. The results, collected in separate faculty and student surveys, indicate that annotation is one of the biggest benefits of using an iPad as part of instruction and that students have high enthusiasm for use of iPads during lecture.

Methods

iPad Pilot 2013



Technology Selection

ACMS examined the technologies other campuses were testing, papers and articles on Educause, and websites that focused on technology trends to determine suitable technologies for testing. The iPad was selected due to two primary features:

- The ability to annotate on top of materials that could be projected to an entire classroom.
- Portability, enabling faculty to make class more interactive.

Recruitment

An initial pool of 45 applicants was identified from responses to ACMS's Winter Quarter 2013 faculty survey. The survey contained a question in which faculty could express interest in a pilot program relating to the use of iPads.

Survey

The initial pool of 40 applicants was invited by email to complete a participant selection survey. The survey can be found in [Appendix A](#).

The survey contained 14 questions designed to assist in selecting participants:

- Title (to determine whether they were an associate professor, adjunct professor, lecturer with security of employment, etc.)
- Currently taught courses
- Familiarity with an iPad
- Previous use of an iPad to support instruction
- Use of other ACMS technology, such as clickers and campus learning management system (LMS)

The survey also asked users to hypothesize about how they would use an iPad in their course and gave them the opportunity to ask questions regarding the pilot program.

Exclusion Criteria

Prospective participants were given the following expectations for participation. As an incentive to participation, they were told that one participant from the pool of those who met all of the criteria would be randomly selected to keep their iPad at the end of the pilot:

- Attend training session and receive iPad
- Participate twice a week in discussion boards pilot site within campus LMS
- Attend three group meetings spaced across the quarter
- Complete participant survey at the end of the pilot
- Ask their students to take a survey regarding use of the iPad during lecture
- Return iPad, case, charger, USB cable, VGA adapter, and stylus by June 21, 2013

Participant Selection

18 survey responses were received. 15 participants were selected for the program. Only full time faculty (defined as tenure-track professors, lecturers with security of employment, or lecturers with potential security of employment) were selected. Specific attention was paid to each participant's academic discipline to ensure a diverse range of fields of study to gather preliminary data as to whether certain disciplines made better use of the iPad's capabilities than others.

Infrastructure Investment

Apple accounts were set up for each participant before they received their iPad. Apple Configurator was used to install apps and control the iPads and allow ACMS to reuse any purchased apps for future iPad pilot projects.

Items purchased:

- 15 iPads (Wi-Fi 16GB third generation) - \$499.00 each¹
- 15 Adonit Jot stylus - \$29.99 each²
- 15 Zagg Invisible Shield screen protectors - \$34.99 each³
- 15 Apple polyurethane iPad covers - \$49.00 each⁴

Modifications to the campus wireless network were also required. The campus wireless system was designed to restrict access between wireless devices for security reasons. Administrative Computing & Telecommunications (ACT) configured the network to allow Bonjour local network discovery services, which allowed AirPlay to operate between the iPad and the user's laptop. These configuration changes were made in the four most frequently used lecture halls.

In one of the lecture halls, too many users attempting to connect to the same access point required the installation of additional access points.

Initial Group Training

Participants attended a group training session where they received their iPads and an orientation to the technology. Under direction as a group, the participants performed the following activities to establish a baseline familiarity with their iPads:

- Connected to the protected campus wireless internet
- Set up access to their campus email

¹ <http://www.apple.com/ipad/compare/>

² <http://adonit.net/jot/pro/>

³ <http://www.zagg.com/invisibleshield/apple-ipad-3-cases-screen-protectors-covers-skins-shields.php>

⁴ <http://store.apple.com/us/product/MD457LL/A/ipad-smart-case-polyurethane-green?fnode=3b>

- Deleted, moved, and grouped application icons
- Stored and moved files in Google Drive⁵ or Dropbox⁶
- Set up passcode lock
- Practiced side switch technique

ACMS personnel demonstrated the following activities:

- Accessing the campus LMS
- Blackboard Collaborate⁷ and Blackboard Mobile Learn⁸ applications
- Reflector in combination with Notability⁹
- Use of iCloud service
- Use of Doceri¹⁰

Applications

iPads were preloaded with certain applications for their use. All participants received the following applications:

- Blackboard Collaborate
- Blackboard Mobile Learn
- Doceri
- Dropbox
- Google Drive
- Notability (purchase required)
- Reflector (for participants' laptops, required purchase)¹¹
- Slide Shark (purchase required)¹²

Each participant's iPad was also preloaded with applications pertinent to their discipline.

Handouts

Participants received a number of handouts at the initial training meeting:

⁵ <https://drive.google.com/#my-drive>

⁶ <https://www.dropbox.com>

⁷ <http://www.blackboard.com/Platforms/Collaborate/overview.aspx>

⁸ <https://www.blackboard.com/Platforms/Mobile/Products/Mobile-Learn/Features.aspx>

⁹ <https://itunes.apple.com/us/app/notability-take-notes-annotate/id360593530?mt=8>

¹⁰ <http://doceri.com/>

¹¹ <http://www.air squirrels.com/reflector/>

¹² <https://www.slideshark.com>

- Apple's iPad user guide
- Basic iPad instructions, created by ACMS, including connecting to AirPlay
- Information on applications pre-installed on their iPad
- Information about connecting the iPad to a computer
- Information about the iCloud service
- Projector connection instructions
- Information about requesting additional application purchases through ACMS

These handouts were also uploaded to the pilot site in the campus learning management systems (LMS).

LMS Site

A site was created on the campus LMS, Blackboard. All faculty participants and ACMS staff working on the pilot had access to the site, which contained:

- ACMS's expectations for participants in the pilot
- List of applications installed by ACMS
- The procedure to request additional applications
- Specific information and/or web links related to the applications
- Methods to move files from their computer to the iPad
- Articles about using the iPad in the classroom
- iPad tips and tricks
- Links to Apple iPad support
- LMS Blackboard support
- Contact information for all participants

The LMS site was also used to communicate with the participants, set up group meetings, and periodically pass information along during the course of the pilot.

Group Meetings

Program participants gathered three times for moderated discussion to allow ACMS to check in with participants. This also gave participants the opportunity to network with each other and share their successes and challenges. To increase attendance, ACMS provided food to all attendees. ACMS posed questions to the participants regarding their use of the iPad in their courses to learn how participants were using them. In addition to program participants, ACMS invited Beth Simon, lecturer with security of employment and director of the UC San Diego Center for Teaching Development (CTD) as well as a user of a tablet PC in her own teaching, and Deborah Forster, Technology Enhanced Learning Initiative Coordinator at the Qualcomm Institute at UC San Diego, to join and add pedagogical insights. Summaries of these discussions were published on the ACMS Blog to update the campus about lessons learned and increase campus awareness of the program.

Participants also received handouts from ACMS at the first two group meetings suggesting applications for use in teaching. At the first meeting, the Pedagogy Wheel¹³ was shared with the group, which divides iPad applications into groups based on Bloom's taxonomy, a classification of learning objectives.

Exit Surveys

All participants were asked to fill out a survey ([Appendix B](#)) about their experience during the pilot program. Questions related to:

- iPad use inside and outside of lecture
- Use of LMS in conjunction with iPad
- Application use
- Benefits and limitations of the iPad in higher education
- Evidence of student engagement and learning improvement (or lack thereof)
- Ease of use
- Favorability towards iPad as a result of the pilot
- Likelihood of continued iPad use in the classroom
- ACMS support for the program

¹³ <http://www.unity.net.au/allansportfolio/edublog/?p=324>

Students enrolled in the participants' classes were also asked to fill out a survey ([Appendix C](#)) about their experience with an instructor who used an iPad as part of the program. Students were given an entry to win a 2GB iPod Shuffle as an incentive to complete the survey. Questions related to:

- Student demographic information (year and major)
- Device ownership (iPad, tablet, or iPhone) and use during lecture
- Interest in collaborative applications for use during lecture (only for iPad or iPhone owners)
- Lecture experience when their instructor used the iPad
- Suggestions for further uses of the iPad
- Lecture experience with an iPad compared to experience without iPad
- Level of encouragement for faculty considering using an iPad in their lecture

Results

Group Meeting Discoveries

Key Advantages	Key Disadvantages
Annotation	Initial handwriting problems
Mobility	Wireless network connection drop-outs and lags
Student question facilitation	Lack of discipline-specific applications

First Meeting

Participants shared how they had used their iPad in the context of their individual disciplines. Their experiences clustered around particular uses of the iPad:

- **Annotation** – The ability for instructors to write on top of images and lecture slides quickly emerged as one of the most useful features of the iPad. Notability was a commonly used application for this purpose. Top Notes and GoodNotes were also used by participants.
- **Visual supplement** – One participant shared that she used her iPad to call up images and videos through the Internet as a supplement to her foreign language class. The size, weight, mobility, and design of the iPad made it much more convenient and natural to use than a laptop computer.
- **Mobility** – Some instructors used the iPad as a way to untether themselves from the lectern and move around the classroom or lecture hall while still having ready access to lecture notes.
- **Reference** – One participant used his iPad to reference his lecture notes during an exam to answer student questions.
- **Fielding student questions** – One participant used her iPad to receive questions from students during her class. Students were able to text questions that the instructor generated through the application TextMe.¹⁴ This application did not require the use of the participant's personal cell phone number. Questions were received in an unobtrusive way that allowed the participant to respond at points in the lecture without disrupting the flow of the lecture. The professor said that she received many more questions compared to classes where students raised their hands.

¹⁴ <http://go-text.me/>

Second Meeting

Discussion by participants centered on handwriting on the iPad. Several participants expressed frustrations with the use of the Adonit Jot Pro stylus. Handwriting did not feel natural for participants.

Specific problems included:

- “Skipping” where the iPad application would not register the stylus’s movement, resulting in gaps in handwriting.
- The inability to rest one’s wrist on the iPad as this would register as writing. ACMS let participants test the Hand Glider glove¹⁵ during the meeting. The glove is designed to overcome this design limitation. Participants preferred the model that covers the wrist and pinky finger over one that covered wrist, pinky finger, and ring finger.
- Student complaints regarding the legibility of handwriting on the iPad compared to on the chalkboard.
- One participant experienced great success writing on his iPad. He noted that it took a great deal of practice to write well on an iPad. This included physically slowing the speed of his writing to allow it to register.

A potentially influential use of the iPad discussed was annotation on top of lecture slides. These annotations could be recorded via screencasting, which captures all projected media from a class in a video file that can be accessed later by students. ACMS already offered screencasting services to courses in properly equipped rooms. While screencasting does not capture work done on the blackboard by hand, it does capture all annotations made on an iPad or similar tablet device. One participant noted that his students have responded extremely positively to screencasting as a source of material review. This participant said that the iPad had the potential to enhance screencasting and improve student learning. However, several participants felt that handwriting needed to be more natural for instructors if they were to adopt it in conjunction with screencasting.

Participants shared strong student feedback in favor of instructors writing by hand, regardless of whether they used an iPad, rather than relying solely on prepared slides. However, writing on the chalkboard often prevented students from being able to read all of the material posted on the chalkboard because the instructor was physically in the students’ line of sight. Therefore, a technological solution that allowed instructors to write by hand in a way that allowed all students to see the notes regardless of the instructor’s positioning was a highly desirable outcome. The iPad was deemed a possible solution to this problem.

¹⁵ <http://www.thehandglider.com/>

Third Meeting

Seven participants attended the final group meeting. Participants were asked to share their overall experience using the iPad over the course of the quarter. Three participants shared their experiences using different setups of the iPad in the classroom.

1. iPad as laptop replacement, connected wirelessly to the projector through AirPlay
 1. *Benefits*: simpler setup for user, full mobility in the classroom
 2. *Drawback*: possibility of lag on AirPlay network disrupting lecture
2. iPad as laptop replacement, connected by cable to the room's audiovisual system
 3. *Benefits*: no connection issues and no interruptions to lecture
 4. *Drawback*: tethers user to the front of the classroom
3. iPad mirroring laptop via Doceri wirelessly via AirPlay
 5. *Benefits*: transition to laptop if connection is interrupted, use of Doceri allows animations to be preserved in lecture slides, annotation, full mobility in the classroom
 6. *Drawback*: Had to quit Doceri at the end of each class to allow Doceri to reaccess the AirPlay network in the next classroom

Discussion of applications that support annotation and handwriting also took place. One professor expressed dissatisfaction with Notability because it did not support handwriting well, though it worked very well for non-writing annotations like lines and shapes. One participant recommended using GoodNotes, which had worked better for him. Participants who were frustrated with annotation through Notability were very interested in the use of GoodNotes. The Adonit Jot Touch 4 stylus, recently released, was also tested. Participants found this to be a better stylus than the Adonit Jot Pro stylus they received at the start of the pilot.

Participants had trouble finding applications that fit their discipline. In some cases, applications were not available. Other participants said that they never invested the time in exploring potentially useful applications for their courses.

One participant used her iPad to allow students to draw on images as part of a class assignment that required a presentation during class. She said that students enjoyed this, but that it took more class time than she expected and required work to catch up with the syllabus schedule.

Participants filled out surveys about their experience at this third meeting and provided verbal feedback about ACMS support. One area where participants indicated a large potential for improvement was in initial training. More extensive in-classroom training was suggested to ensure participants were ready to use their iPad on the first day of class.

ACMS asked participants for better ways to foster discussion on the LMS site. A number of participants said that they were more comfortable responding to posts by others than initiating conversation. Participants also asked for email notification of new discussion topics (in digest form, if possible) as well as email reminders to post in the LMS site.

Participants were also asked whether they wanted to continue using their iPad during summer sessions or Fall Quarter 2013. Of the 7 participants who attended, 6 said yes. The participant who did not want to continue using the iPad said that she never felt comfortable with the iPad and found it clumsy when using it in a graduate course with only 5 students. Her Fall classes included large lectures where she did not want to be distracted by working with new technology. Even though she was not interested in continuing to use the iPad, she saw potential for the iPad to be used for annotation.

Participants who wanted to keep their iPad could do so if they agreed to be senior members of the Fall Quarter 2013 pilot program to help new participants acclimate to using the iPad and avoid pitfalls that they had experienced in the Spring Quarter 2013 program.

Exit Survey Results

Faculty Survey

The seven participants (46.7% of the original 15 participants in the program) who attended the final group meeting filled out an exit survey. All seven respondents used the iPad during the lecture as well as outside of lecture.

The iPad...	# of respondents	% of respondents
Replaced existing lecture activity	6	85.7%
Added new lecture activity	4	57.1%
Changed organization of class meetings	2	28.6%

When asked about how they generally used their iPads, respondents said:

Use	# of respondents	% of respondents
Check email	4	57.1%
Gather material for lecture	3	42.9%
Lecture slide/image annotation	3	42.9%
Upload lecture slides to LMS	3	42.9%
Video presentation	2	28.6%
Image presentation	2	28.6%
Mobility in the classroom	2	28.6%
Document camera replacement	1	14.3%
Laptop replacement	1	14.3%
Whiteboard/chalkboard replacement	1	14.3%
Lecture slide presentation method	1	14.3%
Collection of student questions during lecture	1	14.3%

Respondents were asked for specific thoughts about those applications. 4 used Notability. 2 said that Notability was not good for handwriting. 1 said that Notability was good for drawing while 1 said it was not. GoodNotes, Top Notes, and Notepad did not receive feedback.

Note-taking application	Users
Notability	4
GoodNotes	2
Top Notes	1
Notepad	1

Five respondents worked with discipline-specific applications. Of those five, two respondents indicated that they had trouble with the applications achieving their desired result.

Three respondents indicated that they were interested in using Blackboard Collaborate on their iPad to hold online group meetings or office hours.

Respondents were asked what the greatest benefit of the iPad was for an instructor in the classroom.

Greatest benefit	# of respondents	% of respondents
Annotation on slides or images	4	57.1%
Mobility	3	42.9%
Greater interaction and engagement with students	3	42.9%
Ability to foster student questions	1	14.3%
Camera function	1	14.3%

Respondents were asked in what areas they found the iPad limited. Three respondents said that they found handwriting difficult. Two respondents said that they had wireless connection issues.

Respondents were asked if they saw improved student engagement as a result of using the iPad.

Student engagement improvement	# of respondents	% of respondents
No	2	28.6%
Yes, somewhat	4	57.1%
Yes, a lot	3	42.9%
Did not know	1	14.3%

Both “No” respondents indicated they used the iPad in an extremely limited fashion and believed the technology showed promise to improve student engagement. One respondent split a response between “Yes, somewhat” and “Yes, a lot” saying that it depended on the activity. The “Yes, a lot” response applied when students were asked to work directly with the iPad as part of an in-class presentation. Another respondent said that he traditionally used many techniques to engage students, but the iPad raised engagement even further. A different respondent said that he noticed “significantly more questions from students (x 2-3 fold)” when using the iPad.

Respondents were asked how easy it was to use the iPad.

Ease of use	# of respondents	% of respondents
Very hard	0	0.0%
Somewhat hard	2	28.6%
Somewhat easy	1	14.3%
Very easy	4	57.1%

One respondent said that teaching with the iPad was very difficult at first, but became much easier as the quarter progressed. Another respondent said that he had trouble figuring out how to best use it in a humanities course and thought that having a better example presented up front would have been helpful.

Respondents were asked how long it took them to become comfortable using the iPad in their course.

Time to become comfortable	# of respondents	% of respondents
No time at all	0	0.0%
One week or less	1	14.3%
Between one to two weeks	4	57.1%
Between two weeks to a month	2	28.6%
One month to two months	0	0.0%
More than two months	0	0.0%
I am still not comfortable using the iPad	0	0.0%

Two respondents emphasized that it required persistence to become comfortable with the iPad.

Respondents were asked to describe their overall experience using the iPad.

Overall experience	# of respondents	% of respondents
Very negative	0	0.0%
Somewhat negative	1	14.3%
Neither negative nor positive	1	14.3%
Somewhat positive	1	14.3%
Very positive	4	57.1%

One faculty who answered neither negative nor positive indicated that his experiences were a result of the fact that he did not see the pilot through to completion.

Respondents had the opportunity to share general comments about the pilot. They included:

- The iPad was well received by students, but took up more class meeting time
- Had to invest more time to modify lectures to make them more suitable for the iPad
- Using the iPad required practice and perseverance
- More assistance at the beginning of the pilot program would have been useful
- One respondent felt the iPad was well suited to the course at hand, but could have been quite beneficial in another course

Respondents were asked how likely they were to continue using an iPad in their teaching.

Chances of continuing use	# of respondents	% of respondents
Very unlikely	1	14.3%
Somewhat unlikely	0	0.0%
Neither unlikely nor likely	0	0.0%
Somewhat likely	1	14.3%
Very likely	5	71.4%

All seven respondents said they received sufficient support from ACMS during the pilot. One respondent indicated that he should have asked for more, but failed to do so. Even so, this respondent still answered “yes” to the question.

Respondents were asked if any of the following would have been useful to them during the pilot.

Useful resources	# of respondents	% of respondents
More meetings	0	0.0%
More tech support	0	0.0%
Someone asking me each week about how I was using the iPad	3	42.9%
A TA helping me prepare and find things to do on the iPad	1	14.3%
Someone observing my class and making suggestions related to the iPad	1	14.3%

Respondents were asked if there were other ways that ACMS could have supported them during the pilot. Responses included:

- Continued use of group meetings were a helpful way to hear what other faculty were doing
- More discipline-specific applications

- ACMS support was fantastic, but the iPad was not appropriate for that quarter
- More initial suggestions of how to use the iPad

Student Survey

258 students responded to the survey. The total number of recipients is unknown as participants were asked to email the survey link to their classes and invitation numbers were not reported back to ACMS.

Respondents were asked to provide their major.

Major	# of respondents	% of respondents
Human Biology	53	20.5%
Biochemistry and Cell Biology	36	14.0%
Chemical Engineering	16	6.2%
General Biology	16	6.2%
Pharmacological Chemistry	15	5.8%
Bioengineering/Bioinformatics	14	5.4%
Molecular Biology	11	4.3%
Nanoengineering	10	3.9%
Electrical Engineering	7	2.7%
Neuroscience	7	2.7%
Urban Studies & Planning	7	2.7%
Environmental Engineering	6	2.3%
Psychology	6	2.3%
Chemistry	4	1.6%
Physiology and Neuroscience	4	1.6%
Cognitive Science	3	1.2%
Computer Science	3	1.2%
Management Science	3	1.2%
Mathematics	3	1.2%
Microbiology	3	1.2%
Biophysics	2	0.8%
Computational Physics	2	0.8%
Computer Engineering	2	0.8%
Ecology, Behavior, and Evolution	2	0.8%

Environmental Chemistry	2	0.8%
International Studies	1	0.4%
Aerospace Engineering	1	0.4%
Applied Mathematics	1	0.4%
Chemical Physics	1	0.4%
Economics, Math-Probability & Statistics	1	0.4%
Environmental Systems	1	0.4%
Marine Biology	1	0.4%
Physics and Biophysics	1	0.4%
Probability and Statistics	1	0.4%
Public Health	1	0.4%
Structural Engineering	1	0.4%
Undeclared	1	0.4%

Respondents were asked to identify their year of expected graduation:

Expected graduation year	# of respondents	% of respondents
2013	25	9.7%
2014	28	10.9%
2015	32	12.4%
2016	173	67.1%

Respondents were asked to identify whether they owned any of the following devices:

Device	# of respondents	% of respondents
iPad	69	26.7%
Other tablet (Android or Windows)	33	12.8%
iOS smartphone/iPhone	122	47.3%

Respondents who indicated they owned these devices were asked whether they used them during lecture.

Device use during class	# of owners	% of owners
iPad	43	62.3%
Other tablet (Android or Windows)	13	48.1%
iOS smartphone/iPhone	47	38.5%

Respondents were asked if they would be interested in using applications on an iPad or iPhone to work collaboratively during lecture. They were overwhelmingly in favor of doing so, with 166 out of 223 respondents (74.4%) indicating that they were.

In favor of working with...	# of respondents	% of respondents
Only professors	32	14.3%
Only classmates	13	5.8%
Both professors and classmates	121	54.3%

Respondents were asked how lecture was different when their professor used an iPad. 213 students responded with 113 expressing an attitude regarding the use of the iPad in response to this question.

iPad made lecture...	# of respondents	% of respondents
Better	74	33.9%
Same	28	12.8%
Worse	11	5.0%

Some respondents used the question to discuss specific features of or problems with the iPad:

Observation	# of respondents	% of respondents
Praise for the ability to interact through the iPad, including notation of images and slides	38	167.4%
Illegible handwriting	16	7.3%
Increased mobility for the faculty	15	6.9%
Benefits to receive questions in text form on the iPad	14	6.4%
Lecture moved faster	11	5.0%

Respondents were asked to highlight uses of the iPad that they enjoyed. 126 (54.8%) did so.

Use	# of respondents	% of respondents
Drawing, annotating, or highlighting lecture slides	72	57.1%
Picture taking or video recording via camera	12	9.5%
Ability to receive questions through TextMe application	11	8.7%
Mobility	6	4.8%
Zoom in on lecture slides	5	4.0%
Switching between applications	5	4.0%

Respondents were given the opportunity to suggest ways to use the iPad that their professor did not during the quarter. 30 (13.2%) did so.

Use	# of respondents	% of respondents
Show videos	6	20.0%
Send questions to professor	3	10.0%
Ask questions of the class	3	10.0%
Integrate with a student response system	3	10.0%
Posting of annotated slides	3	10.0%
Switching between applications	3	10.0%

Respondents were asked to compare their professor using an iPad to a professor who did not use an iPad during lecture and evaluate the use of an iPad as part of lecture.

Professor using iPad	# of respondents	% of respondents
Strongly liked it	56	24.2%
Somewhat liked it	93	40.3%
Neither liked it nor disliked it	56	24.2%
Somewhat disliked it	14	6.1%
Strongly disliked it	12	5.2%

Respondents were asked how likely they would be to encourage other professors to use iPads in their lectures.

Encourage other professors to use iPads?	# of respondents	% of respondents
Very unlikely	44	19.0%
Somewhat unlikely	96	41.6%
Neither unlikely nor likely	64	27.7%
Somewhat likely	13	5.6%
Very likely	14	6.1%

Discussion

Lessons for the department

Preparation Time

One of the downsides to performing this pilot during Spring Quarter 2013 was that the break between winter and spring quarters is only one week long. Preparation for the pilot began two weeks before the initial training meeting. This period of time was too short to properly prepare for the pilot and everything it entailed. In the future, a period of six to eight weeks is recommended to solicit and screen participants, purchase equipment, upgrade classroom infrastructure, and train participants.

Participant Training

Adding in-classroom training for all participants is an area to improve future pilots. Showing participants how to perform tasks like connect to AirPlay or set up their iPad in conjunction with their laptop would eliminate problems experienced in the initial stages of this pilot. The greater familiarity a faculty member has with the iPad and individual applications before using it in the classroom was identified by both participants and ACMS staff as a way to improve the experience for faculty.

Addressing Network Issues

Issues relating to AirPlay network connection occurred early in the pilot, underlining the need to address AirPlay issues as early as possible to ensure a positive and smooth experience.

Creating a Useful LMS Site

The LMS site that was provided for participants to share their experiences and difficulties was underutilized compared to expectations at the start of the quarter. Participants said they did not know where to post their thoughts on the site. A proposed solution for this problem is to provide each participant with a public journal where they could write down their thoughts without having to start a new discussion thread. Participants indicated they were more willing to respond to thoughts by others rather than initiate a discussion thread. In future pilots, ACMS should take a stronger role in fostering conversation by initiating discussion topics. A general redesign of the pilot's LMS site to make navigation more intuitive could also lower the barrier for participation.

Application Selection

No participants indicated that they used SlideShark presentation application during the course of the pilot, raising the question as to whether it should be included in the preloaded applications for future pilots.

Alternatively, suggestions on how to use SlideShark may be needed.

No specific data was collected regarding the level of use of applications that were preloaded on the iPads. More targeted questions at the end of future pilots would help to determine what applications are most useful to faculty and should be provided to them at the outset of a quarter. Alternatively, faculty may need to receive specific support for some applications if they are to take advantage of them.

Lessons for faculty participants

Faculty Expectations

Though participants were incentivized with the possibility to keep their iPad if they met certain participation requirements, none of the 15 faculty met the criteria. This suggests one or more of the following:

- Faculty underestimated the amount of time the pilot would take
- ACMS overestimated the availability of faculty to participate in the pilot
- The iPad did not fit the teaching style of the faculty participants or the content of their courses

Transition Time Needed—But Worth It

As the faculty survey only collected data from seven of the 15 original participants (46.7%), their observations should not be called conclusive. However, patterns emerged in the data collected:

- Adjusting to the iPad generally took one to two weeks
- After the adjustment period, teaching with the iPad was very easy
- The overall experience using the iPad was positive
- Participants were very likely to continue using an iPad in their teaching
- ACMS provided enough support during the course of the pilot program

Annotation as a Primary Benefit

Both faculty and student surveys revealed that lecture slide and image annotation was one of the strongest uses of the iPad. While some participants were frustrated with the limitations of Notability, other participants experienced great success with GoodNotes. As a result, substituting GoodNotes for Notability in future pilots may be advisable.

Handwriting Legibility Concerns

Acceptable handwriting was one of the biggest problems and needs to be addressed in future pilot programs. Both faculty and students complained about the legibility of handwriting.

Participants who achieved legible handwriting said that it took a great deal of work to do so. ACMS must communicate the need for this time investment to faculty at the outset of future pilots, just as time must be made to prepare to teach effectively with a blackboard, PowerPoint slides, or any other teaching tool.

One solution to this problem is to substitute highlighting for writing by hand on slides. This would allow faculty to emphasize points on their slides in an interactive fashion without having to worry about legibility.

Additionally, further advances in stylus technology and handwriting recognition applications could make handwriting easier in the future. For example, participants felt that a pressure-sensitive stylus (specifically, the Adonit Jot Touch 4, which had not been available at the start of the pilot) felt more natural and easier to use than the stylus provided to them at the start of the pilot (Adonit Jot Pro).

Further Interest in Facilitating Questions during Lecture

Only one faculty participant used the TextMe application to receive questions during lecture on the iPad. When this use of the iPad was shared with the group, other participants were very interested in using it themselves. Future pilot programs should consider whether this application should be included in the initial set of applications provided to faculty in future pilot programs.

Overwhelming Student Enthusiasm

More than two-thirds of respondents to the student survey were first year students (67.3%). This may be the result of the fact that one of the participating faculty teaches a large introductory level lecture in chemistry. The distribution of majors among student survey respondents supports this conclusion as 223 of the 257 respondents (86.8%) indicated they had a major related to a scientific field of study. As a result, the student opinions expressed in the study largely represent those of students engaged in the sciences and of first year students.

Student response to the iPad was very positive. 65% either strongly or somewhat liked the use of iPad in their courses. 61% were very or somewhat likely to recommend to other professors that they use an iPad in their teaching.

Further Questions Needed to Discover Specific Student Preferences

Data from the student survey provided relatively small feedback (compared to the number of the respondents) regarding their attitudes toward specific aspects of the iPad, such as:

- Legibility of handwriting
- Speed with which the instructor covered material
- Mobility of the instructor
- Use of notation on top of slides

Future pilots should ask targeted questions regarding these areas to determine whether these functions improved or hindered learning.

Appendices

Appendix A: iPad Participant Selection Survey

Academic Computing and Media Services (ACMS) is hosting an "iPads in the Classroom" pilot during the Spring 2013 term. If you are interested in participating, please take a few minutes to answer these questions.

1. First and Last Name

2. Title (Associate Professor, Adjunct Professor, etc.)

3. Email Address

4. Department

5. Mail Code

6. What type of computer do you use during lecture?
 - Mac Laptop
 - PC Laptop
 - Tablet PC
 - iPad
 - Other (please specify)
7. Have you ever used an iPad?
 8. Yes
 9. No
10. Have you ever used an iPad in instruction?
 - Yes
 - No
11. Do you own an iPad?
 - Yes

No

12. What course(s) do you currently teach at UCSD? Please enter one per line.

Class

Class

Class

Class

Class

Class

Class

Class

Class

Class

13. Do you currently use i>clickers in your class(es)?

Yes

No

14. Do you use Ted in your class(es)?

Yes

No

15. How do you envision using an iPad in your course?

16. Do you have any comments about the pilot? Are there any questions we can answer for you?

Appendix B: Faculty Exit Survey

ACMS Spring 2013 iPad Pilot Program Faculty Survey

Thank you so much for being a participant in our first iPad pilot program. We would appreciate it if you shared your experiences using the iPad in your courses by answering the following questions. The questions should take no more than five minutes.

1. Did you use your iPad during lecture?

- No
- Yes

2. Did you use your iPad outside of lecture?

- No
- Yes

Please elaborate on why you did or did not use your iPad outside of lecture

Did the iPad do any of the following in lecture? (Please select all that apply.)

- Replace an existing activity (like writing on the board)
- Add a new activity
- Change the way you organized class meetings

3. Did you use Ted in conjunction with your iPad?

- No
- Yes

How did you use your iPad and Ted? What did you try to do that you couldn't? Was there a reason you didn't use Ted with your iPad?

4. In general, how did you use your iPad in your course?

5. Did you use any note-taking app(s)? If so, please tell us what you used and what you liked or did not like about the app.
6. Did you use any discipline-specific app(s)? If so, please tell us what you used and what you liked or did not like about the app(s).
7. After using the iPad for a quarter do you have any interest in using Blackboard Collaborate on your iPad to hold online group meetings or office hours?
 No
 Yes
8. Did you use any other app(s)? If so, please tell us what you used and what you liked or did not like about the app(s).
9. What do you think is the greatest benefit of the iPad for an instructor in the classroom?
10. What were the limitations of the iPad in your experience?
11. Did you see student engagement and/or learning improve as a result of using the iPad in your course?
 No
 Yes, somewhat
 Yes, a lot

Please elaborate on your observations.

12. Was it easy to use the iPad as part of your class?
 Very hard
 Somewhat hard
 Somewhat easy
 Very easy

Do you have any comments about the iPad's ease of use?

13. How much time did it take you to get comfortable using the iPad during your course?

- No time at all
- One week or less
- Between one to two weeks
- Between two weeks to a month
- One month to two months
- More than two months
- I am still not comfortable using the iPad

Were there specific challenges you encountered in learning to use the iPad?

14. How would you describe your experience using the iPad?

- Very negative
- Somewhat negative
- Neither positive nor negative
- Somewhat positive
- Very positive

15. Do you have any general comments about your experience using the iPad?

16. How likely are you to keep using an iPad in your teaching?

- Very unlikely
- Somewhat unlikely
- Neither likely nor unlikely
- Somewhat likely
- Very likely

17. Did you receive sufficient support from ACMS during the pilot?

- No
- I received some, but not enough

Yes

18. Would any of the following have been useful to you during the pilot? (Please select all that apply.)

More meetings

More tech support

Someone asking me each week about how I was using the iPad

A TA helping me prepare and find things to use or do on the iPad

Someone observing my class and making suggestions related to the iPad

19. Are there any other ways that ACMS could have supported you during the pilot?

Appendix C: Student Exit Survey

During the Spring 2013 quarter, Academic Computing & Media Services (ACMS) provided a number of professors at UC San Diego with iPads to use during their lecture. As a student enrolled in one of these courses we want to hear about your experience! This survey, which will take less than ten minutes to complete, will help us make decisions about using iPads in classrooms. The best part is that everyone who completes the survey will be entered to win an iPod Shuffle 2GB!

1. Please provide us with a little information about yourself.

Name

Major

2. What is your class year?

2013

2014

2015

2016

3. Do you own any of the following devices?

iPad

Other tablet (Android or PC)

iPhone

4. Do you use any of the following devices during lecture?

iPad

Other tablet (Android or PC)

iPhone

There are many applications that allow iPad and iPhone users to work collaboratively with each other.

Examples include:

--Highlighting books and documents

--Multiple authors working on a single document simultaneously in real time

--Social networking for the course

--Creating e-portfolios

5. Would you be interested in using applications on an iPad or iPhone to work collaboratively during lecture with any of the following groups?

My professors

My classmates

- My classmates and my professors
 - I am not interested in using an iPad or an iPhone to work collaboratively during lecture
6. How was lecture different when your professor used an iPad?
7. Are there ways that your professor used the iPad that you really liked?
- No
 - Yes (please elaborate)
8. Are there ways you would like to see the iPad used that your professor did not do during the quarter?
- No
 - Yes (please elaborate)
9. Compare your professor who used an iPad this quarter to a professor who does not use one during lecture. How do you like the use of an iPad as part of lecture?
- Strongly like it
 - Somewhat like it
 - Neither like nor dislike it
 - Somewhat dislike it
 - Strongly dislike it
10. How likely would you be to encourage other professors to use iPads in their lecture?
- Very likely
 - Somewhat likely
 - Neither likely nor unlikely
 - Somewhat unlikely
 - Very unlikely
11. May we quote your statements? Declining to do so will not affect your participation in the iPod Shuffle drawing.
- Yes
 - No
12. Would you like to be entered in the drawing to win an iPod Shuffle 2GB?
- Yes
 - No

