Intentional Use and Evaluation of iPad Applications in the Instruction of Pre-service Teachers

Report for the Instructional Development Office

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Abstract

This study was undertaken to examine how instructor use of emerging technologies can contribute to better quality pre-service teacher education. A group of nine Memorial University Faculty of Education instructors attempted to systematically incorporate mobile tablet (iPad) technologies into their on-campus instruction over the period of one academic year (2013-2014). Participants familiarized themselves with their device; evaluated a range of instructional applications (apps) specific to their discipline and/or teaching focus areas; and attempted to intentionally integrate the device into the classroom-learning environment. The research team utilized several focus groups and semi-structured interviews to elicit the representations of participants with respect to their impressions of the value of tablet technologies and their experiences in implementing tablet technology in their instructional practice.

Methodology

Thirteen instructors from the Faculty of Education, Memorial University responded to a recruitment email (August 2013) to participate in the study. The original protocol involved a group of five instructors representing different instructional specialties. Because there was a higher level of interest than anticipated, and because several instructors already owned iPads, the study was expanded to include nine instructors who met the following criteria:

- a teaching assignment that included undergraduate pre-service teachers in a classroom environment (September 2013 – August 2014),
- a willingness to familiarize themselves with the iPad as a teaching device, and
- a willingness to evaluate apps specific to their discipline and/or teaching focus areas.

Five participants were provided with new iPads, and four participants used previously owned iPads. Eight participants also received adapters to allow for the projection of

iPad content in the classroom. Each participant received a $50.00 iTunes gift card for app purchases, and several requested and received subsequent iTunes cards. The researchers conducted a pre-study meeting and initial focus group session (September 18, 2013) during which participants were briefed on the study and given basic instructions for finding and downloading Education apps using an iTunes account. Open-ended questions were used to elicit participant representations of their knowledge and perceptions of the pedagogical use of tablet technologies; notions of mobile technologies for classroom use; and ideas for the potential of the technology for instruction in the participant's focus area.

Following each of the three teaching terms in the 2013-14 academic year, the researchers conducted a focus-group session where participants were asked open-ended questions and encouraged to participate in guided discussions to identify the ways they used and integrated iPads in their undergraduate classroom teaching and learning, including any challenges they experienced. The researchers also used the sessions to assess how participants perceived tablet technology as a tool for curriculum design, classroom instruction and student assessment. These sessions took place on December 9, 2013, May 15, 2014 and October 14, 2014. The meetings were recorded and transcribed. The transcriptions were thematically coded using the focus group methodology defined by Krueger and Casey (2009). To date, qualitative analysis of the transcripts has determined several themes described below.

Methodology Limitations

A focus group methodology was chosen for this study because it would allow the group of participants to learn and inform one another in a community of practice. This is an interpretive methodology in that the findings are based on the researchers interpretations of the participants' experiences. The inherent limitation of this type of methodology is that the results cannot be broadened to represent larger populations. However, using the work of this group as a case study (Yin, 2009) allows for the production of in-depth results within the ethnographic context of pre-service teacher instruction at the Faculty of Education, Memorial University. It can reasonably be assumed that the findings would have some application in similar contexts at other North American universities.

Participant Involvement

Three male and six female Faculty of Education instructors participated in the study. These nine instructors represented a wide variety of subject specialties from both the Primary/Elementary and Intermediate/Secondary Bachelor of Education programs. At the outset of the study, seven of the nine participants identified themselves as new iPad users; one participant indicated a limited personal proficiency; and one participant indicated s/he was an early adopter and familiar with the technology. At the end of the study, seven participants had either used the iPad within the context of classroom teaching or had explored its potential. One participant indicated a level of personal

adoption, but did not perceive any benefit for the pre-service teachers taking his/her courses. One participant did not demonstrate/mention personal or classroom usage.

Exploration of iPad Apps

Participants explored a wide variety of apps including those intended for K-12 subject-specific programs, content and productivity tools for teachers, and apps for personal use. Several participants noted the existence of a large number of apps available in their subject area that appear to have little or no pedagogical benefit. Participants found many apps that were marketed as useful for education were “gimmicky”, or little more than electronic worksheets. A very limited number of subject-specific apps were identified as beneficial. Multiple apps for personal use were recommended and several participants stated that they had adopted and now regularly use these apps.

Participants felt that subject-specific apps were less beneficial in their instructional practice than they expected. The most useful apps were those that were not subject-specific, but were more general to the teaching enterprise – those that would allow classroom teachers to harness students’ creativity. For example, one participant found that pre-service teachers used multi-media story-creation apps to successfully create K-12 student activities. Other apps designated as having potential for education included presentation apps; audio and video recording and manipulation apps; apps that enabled instructors/students to communicate, either within or outside of the classroom environment; classroom management and assessment tools; and utilities found within the iPad itself (i.e. compass, stopwatch, etc.).

Reported Usage

Participants reported using their iPads in a wide variety of ways. The deepest penetration was reported in the exploration of the *potential* of the device for the instruction of pre-service teachers. The group noted potential in a number of areas, but were prevented from actually using the device by several technical and training challenges:

- a lack of wireless projection ability in assigned classrooms;
- technical issues with the iPad, or with the network functionality when the iPad was connected;
- a lack of available support or training; and/or
- future in-class teaching assignments fell outside the timeline of this study (the courses in which some of the participants saw a opportunity to use the iPads were not scheduled until after the study end date).

Several instructors used their iPads in their classroom and/or encouraged the pre-service teachers to use their own devices or those available from the QEII Library. Unfortunately, because iPads were not widely available in the Faculty of Education, students could not be involved in any activities or assignments assessing and using iPad apps. In order to include all students, two participants who did assign student activities noted that they allowed the use of an iPad app or a web tool. Instructors also

used their iPads to demonstrate apps they felt would be beneficial for education students as they moved into their own classrooms. Other instructors noted that they used their iPad for assessment purposes (i.e. the recording of audio feedback for pre-service teachers).

Eight of the nine participants noted personal use of the iPad for a variety of activities categorized as convenience (i.e. as a tool to replace a broken laptop), entertainment (films, games), and reading (leisure and professional).

Two other positive developments noted by participants were the potential development of a professional learning community of instructors related to technology, and the encouragement of pre-service teachers to explore and use tablets before they are expected to integrate them in classroom teaching.

Challenges and Concerns

In addition to the factors that prevented participants from using their iPad for classroom instruction noted above, other concerns included:

- *Equity of access for pre-service teachers* – while iPads are in use in many K-12 schools in the province, individual pre-service teachers do not necessarily own iPads. Multiple participants reported that less than half of the students in their classes indicated that they had access to an iPad. A much higher proportion of students have and regularly use a smart phone.
- *Steep learning curve and number of available apps* – two participants noted that there is a significant response burden associated with the active and systematic adoption of the iPad. Several other participants noted the high number of apps that they explored, but suggested that without some form of catalog or guide to assist in the selection of effective educational apps, it would likely be impractical for most pre-service teachers to keep current with what is available.
- *Differentiation of the tablet technology from a laptop* – several participants noted that for classroom applications, there was no discernable benefit of an iPad when compared to a laptop device. This lack of distinction led some participants to question the pedagogical application of the devices as being particularly novel or innovative.
- *Skimming vs. close reading* – three participants noted that reading on a device seems to promote scanning of information as opposed to studying, or deep reading and analysis of texts. This seems consistent with other observations regarding the ways learners engage with electronic text.

Recommendations

The findings suggest that problems with wireless projection in the application of tablet devices at Memorial University is limiting attempts by classroom-based instructors to effectively use tablets to their maximum potential. This functionality will be pursued and explored further.

In addition, the study findings indicate that pre-service teachers do not have ubiquitous access to tablet devices, but will be expected to use them in the classroom environment as they take on positions in the K-12 school system. The addition of a set of tablets for use by pre-service teachers would be beneficial and is recommended for the Faculty of Education.

Dissemination

The findings of this study will be further analysed and compared to current literature to assess the extent to which instructors in this study had comparable experiences to those in other Faculties of Education adopting tablet technologies. Specifically, the study will compare its findings to those reported in Baran's (2014) *Review of Research on Mobile Learning in Teacher Education.*

Detailed results of this study will be presented in a Faculty Education seminar series and at least two planned conference presentations. The dissemination of results was unavoidably delayed due to the principal investigator's unanticipated medical leave.

Budget

Date	**Transaction**	**Amount**
August 12, 2013	Apple iPad 64gb (3)	$2266.47
August 12, 2013	iTunes cards ($50 x 10)	$500.00
August 12, 2013	Apple adapters	$268.65
August 29, 2013	Apple iPad 32gb (2)	$1291.68
September 18, 2013	Apple adapters	$177.63
January 21, 2014	Secure flash drive and USB Headset (transcription)	$105.27
March 10, 2014	iTunes cards ($15 x 6)	$90.00
March 4, 2014	Research materials (monographs not available from MUN Libraries)	$283.86
Total Expenditure (IDO 100001-40054-A-1009)		**$4983.56**
September 18, 2013	Meeting supplies	Faculty of Education
December 9, 2013	Meeting supplies	Faculty of Education
May 15, 2014	Meeting supplies	Faculty of Education
October 14, 2014	Meeting supplies	Faculty of Education
October – December 2014	Transcription (LA 3)	Faculty of Education

References

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Krueger, R. A. & Casey, M. A. (2009) *Focus groups : A practical guide for applied research* (4th ed.). Thousand Oaks, California: Sage Publications.

Yin, R. K. (2009). *Case study research : Design and methods* (4th ed.). Los Angeles, Calif: Sage Publications.