iLearning: The future of higher education?
Student perceptions on learning with mobile tablets

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Abstract: The growing use of mobile technology on college campuses suggests the future of the classroom, including learning activities, research, and even student-faculty communications, will rely heavily on mobile technology. Since Fall 2010, an interdisciplinary team of faculty from Indiana University – Purdue University Indianapolis (IUPUI) has experimented with the use of iPads in the classroom. This paper includes the preliminary results of a study on student impressions of mobile technology in the classroom. The paper will report both opportunities and limitations for incorporating mobile technologies in learning environments.

Keywords: Future classroom, faculty/student relationship, learning styles and technology, information and technological literacy, collaborative learning, mobile learning

I. Introduction.

Changes in technology continue to alter possibilities for learning and create new challenges for pedagogy. Over the last two decades, colleges and universities adapted and responded to the Internet, email, chat and instant messaging, course management software, podcasts, personal digital assistants (PDAs), and much more. The growing use of mobile technology at colleges and universities is the most current trend forcing educators to evaluate the merits and limitations of a new technology. A recent EDUCAUSE report revealed a stunning increase in college-age students using mobile technology, such as smart phones: from 1.2% in 2005 to 62.7% in 2010 (Smith & Caruso, 2010). The Pew Internet and American Life Project reports similar trends, particularly among students 18–29-years (Smith, 2010). Further, projections suggest that by 2015 mobile tablets will overtake desktop usage (IDC, 2011) and 80% of all people accessing the Internet will be using a mobile device (Ericsson, 2010). Consequently, mobile technology figures prominently in the future of higher education, particularly in its integration into teaching and learning.

Mobile tablets burst onto the market with the release of the first Apple iPad in March 2010. In the following academic year (2010-2011), an interdisciplinary team of faculty from Indiana University – Purdue University Indianapolis (IUPUI) studied the use of mobile technology for learning using the Apple iPad 1 as part of a Faculty Learning Community (FLC). This FLC explored student perceptions of learning and engagement when iPads were used as a supplemental learning tool in the classroom. The team used iPads for in-class learning activities and assessment, for communication, for research support, and much more. For example, students used concept-mapping applications (apps) to trace connections between communication theories.

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Music students practiced with ear and interval training apps. The accelerometer built into every iPad in tandem with motion graphing apps allowed students to study the physics of human motion. These activities represent only a fraction of the learning activities developed by faculty in this study. This article reports major themes that emerged from student responses to learning with mobile tablets, specifically iPads.

II. What is Mobile Learning?

A. Defining Mobile Learning.

A review of the literature reveals that the definition of mobile learning, especially in higher education, remains unclear and uncertain. To construct a fixed meaning for mobile learning is untenable as mobile learning is the summation of multiple, evolving concepts (El-Hussein & Cronje, 2010). In addition, discourse on new technologies often involves a miscellany of terms and preliminary conclusions that represent a wide range of uses and functions (Guri-Rosenblit, 2005). For example, the keywords *mobile learning, m-learning, hypermedia-assisted learning, ubiquitous computing, mobile instruction technologies, handheld learning* and *e-learning* represent only a sample of terms that variously point towards related functions and concepts (Alexander, 2004; Carver, Howard, & Lane, 1999; Corbell & Valdes-Corbell, 2007; Dearnley et al., 2009; EDUCAUSE, 2006; Guri-Rosenblit, 2005; M. El-Hussein & Cronje, 2010; Traxler, 2007; Vesisenaho et al., 2010; Zywno & Waalen, 2002). Moreover, rapid advances in technology outmode previously constructed definitions and conceptual frameworks.

Definitions that withstand technological innovation are broad in scope and carefully consider the terms *mobility, mobile devices,* and *learning*. This knowledge led El-Hussein & Cronje (2010) to define mobile learning as "any type of learning that takes place in learning environments and spaces that take account of the mobility of technology, mobility of learners, and mobility of learning" (p. 20). Cobcroft, Towers, & Smith (2006) confirm that "mobile technologies are able to support learners' engagement in creative, collaborative, critical, and communicative learning activities" (p. 25). In a subsequent review of the literature, Traxler (2007) makes two suggestions: mobile learning is uniquely placed to support learning that is personalized, authentic, and situated; and the future will find mobile learning facilitating a wide variety of teaching methods. Following these definitions and recognizing that meaning continually evolves, the research team defines mobile learning as *the efficient and effective use of wireless and digital devices and technologies to enhance learners' individual outcomes during participation in learning activities*.

B. Potential of Mobile Learning.

The story of mobile learning is no longer a narrative about devices—iPods, phones, tablets, PDAs, or similar "always connected" wireless machines (Johnson, Smith, Willis, Levine, & Haywood, 2011). A NESTA Futurelab report asserts that learning activities incorporating mobile technology will move further out of the classroom and further into the learner's physical and virtual environments, amplifying learning to be more situated, personal, collaborative and lifelong (Naismith, Lonsdale, Vavoula, & Sharples, 2004). Due to more affordable technology and improving digital networks, many people turn to mobile devices as their first choice for connectivity (Johnson et al., 2011).

Learning with mobile technology allows students, then, to expand discussion and investigation beyond the walls of the classroom. It enables students to collaborate and create knowledge and to interact with a larger range of content. Thus, mobile learning supports a social constructivist view of learning because it enhances students' ability to learn and apply course content in context with other students (Alexander, 2006; Bryant 2006). The FutureLab report mentioned above also found that mobile learning enables students to apply knowledge through "participatory simulations" and "immersive recreation of dynamic systems" (Naismith et al., 2004).

Effectively matching student learning styles to instruction is a proven factor in contributing to academic achievement (Felder & Soloman, 1998; Felder & Spurlin, 2005; Peacock, 2001). Integrating technology into instruction expands possibilities for creating learning activities that engage student's multiple learning styles (Naimie, Siraj, Ahmed Abuzaid, & Shagholi, 2010). Studies using data from the National Survey of Student Engagement (NSSE) found positive correlations between the use of educational technology and student engagement, notably in collaborative learning and student-faculty interaction (Chen, Lambert, & Guidry, 2010; Nelson Laird & Kuh, 2005). Zywno and Waalen (2002) confirm the hypothesis that hypermedia instruction, or instruction using hypertext and multimedia, enhances academic performance in students across learning styles. In particular, classes that combine information and communication technologies with face-to-face traditional learning increase the engagement of students by intersecting learning styles (Cobcroft et al., 2006).

One of the principal features of mobile learning is the flexibility for students to engage in the educational process and material anywhere, any time (Dew, 2010). Mobile technologies address a modern need for convenience, like the option of downloading learning resources in an increasing number of electronic formats (Fallaize, 2010). Growing numbers of students expect the ability to "work, learn, and study whenever and wherever they want" (Johnson et al., 2011, pg. 3); further, students experience frustration when this expectation is not met. Researchers have found that access to information has benefits in many learning and professional contexts. For example, in healthcare, access to information at patients' bedsides not only augments the learning process, but also improves patient care and health outcomes (Farrell & Rose, 2008).

C. Cautions for Mobile Learning.

Even though there have been many reports on the benefits and potential of mobile learning, a number of researchers have found reasons to advise caution on its full adoption. Long has there been an ongoing discussion on the digital divide, the multidimensional phenomenon concerning global, social, and democratic disparities arising from utilitarian integration of and individual access to the Internet, in higher education (Norris, 2001). Some researchers maintain that, while the Internet and digital technologies unequivocally heighten the potential access to higher education, unprepared students and faculty require intensive and steady institutional support (Corbell & Valdes-Corbell, 2007; Guri-Rosenbilt, 2005). Particular to mobile technologies, Common Sense Media exposes an emerging "app gap" wherein lower-income children (ages 0-8) have more than 50% less experience using mobile devices than higher-income children in the same age group (Rideout, Saphir, Tsang, & Bozdech, 2011, p. 10). Only 2% of lower-income children have access to a mobile tablet in the household, compared to 17% of the higher-income group (Rideout et al., 2011, p. 22). Corbell & Valdes Corbell (2007) forewarn that mobile

learning activities could create a sense of isolation in non-technical students who are not familiar with technologies (p. 54).

Beyond the problems of digital and technological divides, Guri-Rosenblit (2005) identifies a concern in the adoption of new technologies: "The problems and questions that the digital technologies assist in solving in teaching/learning practices are blurred and not clearly defined" (p. 18). Though not specifically directed at mobile tablets, this point is easily applicable in consideration of professed "magical" devices claiming to augment traditional computing. Researchers studying the implications of the iPad recommended the study of students' perceptions of the mobile tablet for teaching and learning (Bansavich, 2011). Wang, Wiesemes, and Gibbons (2012) report that problems with the size of mobile devices and failures of wireless Internet (Wi-Fi) connectivity cause frustration and disappointment in students (p. 573-74). Thus, these cautions articulate the need for inquiry into student learning and engagement with the use of mobile tablets in the classroom.

In recent studies of student perceptions on the integration of emerging technology into classroom instruction, students generally report positive experiences with the technology; however, findings also reveal that instructional design and comfort with technology are significant factors (Armstrong, 2011; de Winter, Winterbottom, & Wilson, 2010; Enriquez, 2010; Shuler, Hutchins, & LaShell, 2010; Yang & Lin, 2010). Students have attributed negative qualities to instructional technology due to ineffective implementation in classrooms and learning activities (Armstrong, 2011, p. 224). Concluding that a significant amount of the potential for success in using new technology is dependent upon the instructor, the literature suggests that support for instructors is vital. A study on the perceptions of students and teachers on the affordances of new technology found that supporting teachers in integrating technology into teaching can contribute to useful pedagogical outcomes (de Winter et al., 2010). Further, researchers found that new technologies (wikis, digital video, podcasts, PDAs, game consoles, and tablet computers) can support social construction of learning, assessment, motivation, differentiation and personalization of, and engagement in learning for students (de Winter et al., 2010; Enriquez, 2010). Students have also reported activities using tablet computers in class foster productive collaborative learning and improve interactions with peers and instructors (Shuler et al., 2010). Similar studies of student perceptions of learning with mobile devices and tablet computers call for research in multiple courses and across multiple sections for a larger sample (Enriquez, 2010; Yang & Lin, 2010).

III. Purpose and Methodology.

The purpose of this study is to explore student perceptions of learning and engagement that occurs as a result of using iPads in the classroom. This methods section is organized in four key areas: (a) arrangement for conducting the study, (b) selection of subjects, (c) instrument design, and (d) treatment of the data.

A. Arrangement for Conducting the Study.

This study was conducted at Indiana University – Purdue University Indianapolis (IUPUI), an urban institution with an annual enrollment of approximately 30,000 undergraduate, graduate, and professional students seeking degrees from Indiana University (IU) and Purdue University (PU) programs. In June 2010, IUPUI's Center for Teaching and Learning and University

Information Technology Services issued a call for applications to create a Faculty Learning Community (FLC) to explore the use and implications of iPads in technology-enhanced pedagogy. Interested instructors submitted proposals detailing how iPads could help achieve course learning outcomes and increase student engagement. Out of nearly sixty applicants, eight IUPUI faculty members were selected for the 2010-2011 FLC on Mobile Tablets. Faculty members met biweekly during the Fall 2010 pilot and the Spring 2011 study to share observations, reflect on their classroom experiences with the iPads, and to design this study. Seven of the eight instructors in Music, Communication Studies, Tourism Management, Physical Education, English, Organizational Leadership and Supervision, and Library Science participated in the research study to measure students' perceptions of iPad usage.

Prior to an iPad activity, class instructors requested specific apps to be installed on the iPads and designed iPad activities that promoted active learning, collaboration, and/or student engagement. At the beginning of each activity, individual students or small groups of students were loaned an iPad to use for the class period. If required, the instructor gave instructions for connecting the iPad to the Internet and setting up email. Many times students were free to move about the room and/or pass the iPads around to view others' work. Following the activity, the students submitted their work to the instructor through email or a file sharing application such as Dropbox. The iPads were then collected by the instructor and given back to the technology administrator who would reset the iPads removing all student work and login information, and prepare the iPads for use in the next class. Over the course of the semester, the number of exposures the students had to the iPads ranged from 1 to 7 times depending on the class in which they were enrolled (Table 1).

B. Selection of Subjects.

In total, 209 IUPUI students participated in the study. This was a convenience sample, as the students who participated in the study were in the classes of the instructors in the FLC cohort. All students in the selected courses were eligible for participation in this study, but participation was voluntary and anonymous. Students' participation had no bearing on their status in the course and did not affect their grade in any way. All data collection and analysis procedures were performed in accordance with the Institutional Review Board of Indiana University.

C. Instrument Design.

Students were asked to complete a survey with both Likert-scale and open-ended responses after the final class session in which iPads were used for a learning activity. This concurrent mixed method approach allowed for the collection of both qualitative and quantitative data. The instrument was reviewed by the entire FLC, which represented expertise in mixed methods survey design. The intent of the review was to verify that the questions compiled in the survey were understandable and clear, were sequenced in a logical format, and avoided leading statements, closed-ended questions, and ambiguity. The complete survey is provided at the end of the study (see Appendix A).

Table 1. Discipline-Specific iPad Use.

School/ Department	Course(s)	Activities	Number of Class Sessions with iPads
Tourism Management	Global Tourism Seminar; Mechanics of Meeting Planning	Evaluate tourism applications; view virtual venue tours, select meeting sites, design meeting rooms, plan menus, and create staffing grids.	3
Organizational Leadership and Supervision	Leadership for a Global Workforce	Create and access open source learning modules.	1
Music	Musicianship 2; Musicianship 4	Train musicians to measure intervals and hear the differences between two notes sounding together or in part.	3
Communication Studies	Introduction to Communication Theory	Demonstrate connections between communication theory and real-life scenarios with mapping applications; explore news apps and websites.	7
English	Communication Skills for International Teaching Assistants; English for Academic Purposes II	Provide active learning experiences for international students studying English for Academic Purposes.	2 and 4, respectively
Physical Education	Biomechanics	Measure human movement using the iPads' native accelerometers and video analysis apps.	7
University Library	Computer Methods for Journalism	Improve academic honesty by teaching when and how to cite another's work.	1

This study focuses primarily on rich, thick descriptive data collected in the four open-ended questions of the survey:

1. Describe how the iPad activity helped or limited your learning of the class content.
2. Describe at least two things you liked about using iPads in this class.
3. Describe at least two things you disliked about using iPads in this class.
4. Do you have any suggestions for other ways to use the iPads in learning class content?

This study also includes a sample of the quantitative data from twelve Likert-scale survey questions used by all researchers (eight optional questions have been omitted from this data set because they were not included in every survey). The twelve Likert-scale questions are included in Table 2.

Table 2. Likert-scale Survey Questions (5 point scale: Strongly Disagree to Strongly Agree).

Select how strongly you agree or disagree with the following statements.
1. The iPad activity helped me apply course content to solve problems.
2. The iPad activity helped me learn the course content.
3. The iPad activity helped me connect ideas in new ways.
4. The iPad activity helped me participate in the course activity in ways that enhanced my learning.
5. The iPad activity helped me develop confidence in the subject area.
6. The iPad activity helped me develop skills that apply to my academic career and/or professional life.
7. The iPad activities motivated me to learn the course material more than class activities that did not use the iPad.
8. I participated more in class during the iPad activities than during activities that did not use the iPad.
9. My attention to the task(s) was greater using the iPad.
10. The iPad was more convenient compared to a desktop or laptop computer.
11. It was easier to work in a group using the iPad than in other group activities.
12. iPad activities are an important supplement to this class.

D. Treatment of the Data.

The quantitative analysis of the data was conducted using Statistical Package for Social Sciences (SPSS). Frequencies, mean scores, and standard deviations were initially computed and a variety of descriptive statistics was utilized to determine the sample characteristics. Survey responses were manually scored (Strongly Agree = 5, Agree = 4, Neutral = 3, Disagree = 2, Strongly Disagree = 1) and entered into a SPSS database.

Student responses to the open-ended questions were compiled and recorded in an Excel spreadsheet. Following Creswell's (2003) description of several strategies encouraged to ensure the qualitative study's rigor and credibility, two investigators reviewed the open-ended responses independently and generated a preliminary coding rubric to categorize recurring themes in the data. The two researchers then met to discuss negative or discrepant information, to clarify any researcher bias, and modify the themes. Using member-checking strategy, the other FLC

researchers reviewed the preliminary common themes and the research team used triangulation to finalize the theme results, including current and past studies conducted on student perceptions toward technology use and other research reports.

IV. Findings.

Surveys were collected from 209 students in 9 courses. The researchers collected demographic information for gender and age. Table 3 displays the demographic information and Table 4 displays the distribution by course.

Table 3. Demographic Information.

Gender		Age	
Male	107 (51.2%)	18-28	173 (82.8%)
Female	91 (43.5%)	29-44	26 (12.4%)
Did not identify	11 (5.3%)	Did not identify	10 (4.8%)

Table 4. Number of Students by Course.

Course	Number of Student Responses	Percent
Introduction to Communication Theory	36	17.2
English for Academic Purposes	55	26.3
Communication Skills for International Teaching Assistants	18	8.6
Biomechanics	32	15.3
Computer Methods of Journalism	23	11.0
Musicianship 2	9	4.3
Musicianship 4	11	5.3
Leadership for a Global Workforce	10	4.8
Global Tourism Seminar: Mechanics of Meeting Planning	15	7.2
Total	**209**	**100.0**

A. Quantitative Data.

The twelve Likert-scale survey questions were categorized into questions about student perceptions on learning (Table 5) and student perceptions on engagement (Table 6). The variance in *n* is a result of incomplete surveys where a respondent skipped a question.

Table 5. Survey Questions on Perceived Learning.

Question	*n =*	*m =*	*sd =*
1. The iPad activity helped me apply course content to solve problems.	205	4.092	0.8
2. The iPad activity helped me learn the course content.	204	4.044	0.818
3. The iPad activity helped me connect ideas in new ways.	204	4.343	0.792
4. The iPad activity helped me participate in the course activity in ways that enhanced my learning.	207	4.188	0.809
5. The iPad activity helped me develop confidence in the subject area.	208	3.923	0.89
6. The iPad activity helped me develop skills that apply to my academic career and/or professional life.	205	4.044	0.851

Table 6. Survey Questions on Perceived Engagement.

Question	*n =*	*m =*	*sd =*
7. The iPad activities motivated me to learn the course material more than class activities that did not use the iPad.	209	3.612	.851
8. I participated more in class during the iPad activities than during activities that did not use the iPad.	208	3.505	1.148
9. My attention to the task(s) was greater using the iPad.	207	3.657	1.087
10. The iPad was more convenient compared to a desktop or laptop computer.	207	3.942	1.119
11. It was easier to work in a group using the iPad than in other group activities.	209	3.789	1.1
12. iPad activities are an important supplement to this class.	207	3.802	0.945

When calculating the averages for the perceived learning and perceived engagement variables, any case with a missing value for a question was not included in the calculation. This left 192 and 206 usable responses for perceived learning and perceived engagement respectively. Figure 1 shows the distribution of means for the aggregated perceived learning and perceived engagement variables.
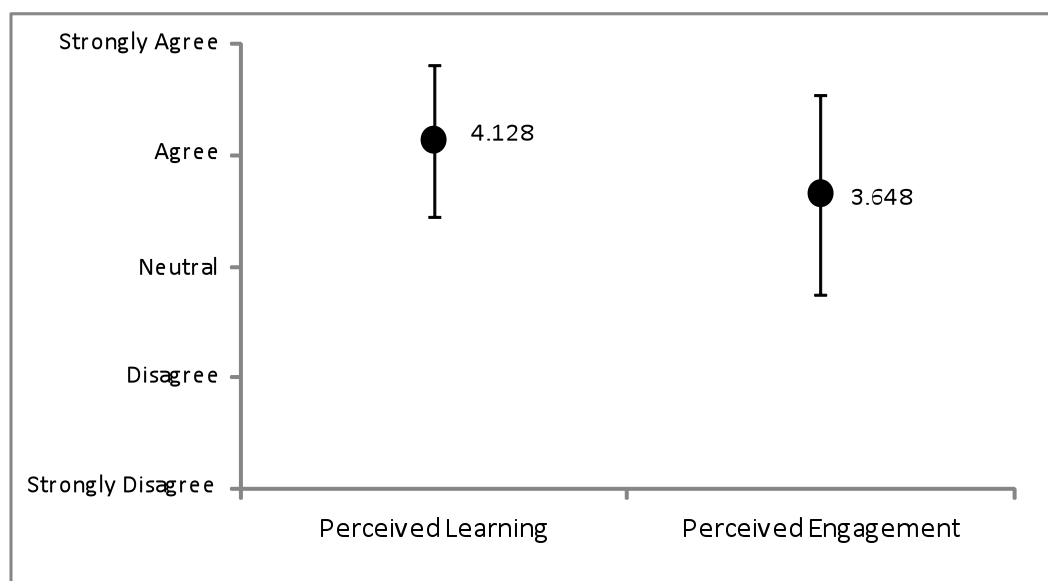
Figure 1. Distributions of Mean Perceived Learning and Engagement.

B. Qualitative Data.

The investigators identified five major themes in student responses to the open-ended questions. Each theme featured both opportunities and limitations for the use of mobile technology in the classroom (Table 7). The themes include: 1) access and availability of information, 2) sharing and collaboration, 3) novelty, 4) learning styles and preferences, and 5) convenience and functionality. This section uses evidence from student responses to illustrate and support the limitations and opportunities for each theme.

Access and Availability of Information. In many activities, students were required to use the Internet browser or tools such as the IUPUI University Library mobile web site to locate resources and find information. Student responses prominently featured both positive and negative attitudes towards the impressive availability of information that mobile technology affords. One student reported, "We can find information online in class and share with one another." Another student wrote, "By having the Internet readily available I was not limited to the textbook." Students responded positively to the ability to expand their search for and discussion of knowledge beyond the walls of the classroom by "find[ing] examples that were relevant to class topics on the web." A journalism student using the library's mobile website to access databases felt that "it was easier to stumble upon new/various information." Rapid access to information was particularly valuable in courses that relied on online course management tools (i.e. Blackboard, Angel). The "resources were right there in class" when faculty referenced specific course documents online. Another student wrote, "All the tools you need [to learn] are right there and customizable to your needs."

Table 7. Opportunities and Limitations of Mobile Learning (Summary).

Theme	Opportunities	Limitations
Access and Availability of Information	Research Real world problem solving	Distraction Undeveloped information literacy
Sharing and Collaboration	Collaborative learning and group work	No ownership of technology/shared resource
Novelty	New learning tool Dynamic learning environment	Lack of training Rapidly "outdated" technology Orientation to technology distracts from traditional learning time
Learning Styles and Technology Design	Design elements include more learning styles (tactile, kinesthetic, visual, auditory)	Design elements negatively impact learning (keyboard, size, app availability)
Convenience and Usability	Ease of use Intuitive design Variety of apps	Connectivity troubles paralyze learning Unstable/unreliable applications impact learning

Students also reported downsides to easy information access and availability. Perhaps the biggest limitation relates to students' ability to access popular distractions: social networking, email, and games. Many students admitted to checking "email and Facebook rather than participating because it was easier to hide." Others found themselves wanting to "play with the apps or search the web rather than focus on course material." The iPad "limited [one student] from learning because [the student] got distracted by all of the apps." Another simply "lost attention after a while." Students found it "hard to have discussion when attention was focused on the iPad" and students reported difficulty listening to the professor while exploring iPad apps.

Sharing and Collaboration. Student responses indicated that mobile technology supports collaborative learning environments in which students are expected to discuss concepts, debate questions, and build knowledge together. Students noted how iPads promoted greater interaction and sharing during in-class activities and discussions. For example, one student reported, "I feel like I got more involved with class discussion and group discussion when using iPads rather than just lecturing." Another wrote, "The iPad gave me a chance to connect concepts and ideas quickly and efficiently with my peers." Students remarked specifically on the advantages for group work. For example, the iPad helped "because it encourages active input from groups." One student summed up the benefits of mobile tablets for collaborative learning: "It helped me because everyone in my group could work separately but together at the same time."

One of the most significant drawbacks of mobile technology in this study is that the iPads were a shared resource. The researchers had access to 40 iPads, which could only be used in class and in some cases the iPads had to be shared among students. Students reported that "it was hard to look at the screen with a group of people" and "it was harder to see what the other people

in my class were doing compared to a regular desktop." One student claimed "working in groups is difficult." Another noted, "We have to share. We should have one for each person."

Novelty. Students reported enthusiasm for the novelty of mobile learning. The iPad "brings in a new style." The devices provide "something different and make class more interesting." They offer "a nice change of pace to the normal routine." One student described the mobile learning activities as a "fresh" way to learn. Another called the iPads "fun, exciting, easy, [and] futuristic." In fact, many students used the words "fun" and "interesting" when describing their experience with the iPads, indicating a favorable experience with mobile learning. One response summarizes the general sentiment about the novelty of mobile learning: "It's nice to switch things up, and using the iPads was a 'fun' way to learn something that's useful towards our degree." Students also reported their enthusiasm for "getting familiar with newer technology" and "emerging technology." A student appreciated the ability to "use new technology [they] don't have" and another celebrated the opportunity to use "something new that I wouldn't get the chance to do anywhere else." Students reported a value in the "opportunity to engage the tech of the future." As one student claimed, "We live in the technology age so using technology is important to help develop proficiency." In addition, during the time these surveys were administrated the iPad 2 was being introduced to the market. Illustrating the excitement over new technology, some students noted that "the newest generation would be cooler" and commented on when and if they would test the updated version of the mobile technology.

Despite the enthusiasm for these new devices, the novelty of the iPads proved detrimental to some students' classroom experience. Students said that the device was "confusing at first" and that they were "not familiar with using [the iPad]." Some students expressed frustration with a technological learning curve. For example: "Understanding of how to use the iPad was a barrier," and "I felt as though I spent more time figuring out how to use [the iPad and different apps] than I did concentrating on the lesson." Another student "spent more time trying to use the iPad than being productive." Students disliked that the set-up of the iPads seemed to take "more time to prepare for class to start" and that once set-up, they still required "class time to practice." Students reported a need for more instruction on the device before "jumping right in." This instruction and set-up time "took away from … class learning."

Learning Styles. Students reported that mobile technology offered a change from more standard lecture and discussion-based activities in college classrooms. The devices "helped solidify the things we learned in class, and helped give us an alternative method of practicing those ideas and concepts." The devices also proved valuable for students who needed different learning paces. One student reported that "the iPad helped in learning by going at the pace of the user. This helped [the student] focus on specifics." A total of 117 students reported a specific way the iPad suited their learning styles, preferences, and speeds. For example, one student reported that the "iPad helped my learning by keeping me involved with the learning because instead of sitting and listening I was actually involved and getting hands on experience." This tactile learning enhanced the material for many students: "You do it yourself, so it's hands on, but it's also visual that you learn it well."

Despite the overwhelming benefits, some students' reported that the iPads hindered their ability to learn. Elements of the iPads' design caused some barriers to learning. The most often cited frustration was the touchscreen keyboard, which caused typing troubles for many students. The keyboard elicited unfavorable comparisons to other note-taking methods: "I am faster at writing notes on paper than with an iPad" and "[t]akes a little longer to type than a [standard] keyboard." Students also had trouble with the touchscreen feature in general. Some students

were frustrated by the touch screen sensitivity and accuracy, which hindered their ability to engage a lesson or activity. Only two students seemed to reject the iPad as a learning tool outright. The most strident rejection of the technology came from a student in a class where iPads were incorporated only once: "Very limited; No need, no keyboard – The iPad is a toy and has no place."

Convenience and Usability. Mobile technology is touted for its intuitive use and convenient portability. Although students reported a slight learning curve, many students quickly recognized the convenience and ease-of-use for the iPads such as the student who said simply: "Helped by the technology and it was easy to use!" Students noted the following features of mobile technology as contributing factors to its convenience in a learning environment: speed, portability, intuitive functions and navigation, comfortable design, and small size. According to one student, "The iPad is a quick resource for students to use in the classroom. It creates a more productive class meeting." Students also juxtaposed the iPad's convenience to more familiar computer technology. For example, one student appreciated the ability "to move around as opposed to being stuck at a desktop." Another found it more convenient "than carrying my laptop with me." The following response linked the convenient functioning of the iPad with activities that directly complement learning: "It was convenient and fun. It was nice having something up to date to work with and have work properly. It kept my attention and allowed me to see things in real activities. The portability of them made it easier to discuss with the professor."

Although convenience was a strong theme in the responses, one major inconvenience garnered more criticism than any other feature of the iPads: connectivity. The majority of students commented on "slow connections," "internet issues," "problems staying online," and other variations on this theme that clearly signaled how vital high speed Internet access is for the utility of these devices. Another inconvenience is the stability and design of applications. One student noted, "Some of the example [applications] were buggy and ineffective." Another observed, "Apps can be unstable." Students also criticized the functionality of some applications: "The apps are somewhat limited;" "Some apps had mistakes;" and "The controls on some apps were not intuitive." Between connectivity concerns and application bugs, students disliked the "time wasted when the iPad wasn't working properly."

V. Discussion.

Amidst the release of mobile tablets such as the iPad 1 and iPad 2 and the rapidly growing market for such devices, this study attends to the limitations and opportunities of mobile tablets for learning in college classrooms. Heavy focus on the physical operation of particular mobile devices has undermined previous understanding on the topic of mobile learning. Recent reviews of mobile devices in education highlight the need "to understand and embrace the changes in learners, teachers and institutions in concert with associated [information and communication technology] advances, whilst acknowledging the risks" (Cobcroft et al., 2006, p. 21). In other words, research on mobile learning must "describe in detail the various advantages and disadvantages of mobile instructional devices as tools for the delivery of higher education" (El-Hussein & Cronje, 2010 p. 20). Thus, this research follows the call to consider learners' experiences with mobile technologies in education and it investigates how mobile learning can be used to make a unique contribution to the advancement of higher education and learning (El-Hussein & Cronje, 2010; Traxler, 2007).

A. Amplifying Advantages of Mobile Technology.

Through the last decade, students increasingly benefit from online courses and content delivery, podcast lectures, educational apps on mobile tablets, and collaborative activities through social networking platforms, all of which allow students incredible freedom over when and how to pursue the learning process. More than any previous mobile learning technology, tablets provide students immediate and far-reaching access to information, course resources, and real world application of knowledge. More important, students perceive this access as beneficial to their learning. The three strongest perceptions in the findings were "The iPad activity helped me connect ideas in new ways" (m = 4.343, sd = 0.792), "The iPad activity helped me participate in the course activity in ways that enhanced my learning" (m = 4.188, sd = 0.809), and "The iPad activity helped me apply course content to solve problems" (m = 4.092, sd = 0.8). The qualitative data corroborated these findings, particularly student responses in the themes of novelty, information access, collaboration, and learning styles.

First, new technology often evokes feelings of both excitement and anxiety from students and faculty, and the iPads proved no different. Student responses indicated that the novelty of the iPads contributed positively to learning: the "fun" experience resulted in better student learning and engagement. One student explained, "During the whole semester, I paid more attention in class while using iPads than when I wasn't using [them]." Students responded that the iPad "motivates me to learn the class content" and "made me want to come to class." In addition, they said that the mobile learning activities "kept my attention" and "kept me involved." Another student claimed that the favorable and novel experience of iPad learning activities "helped to improve my skills instead of the usual routine."

Second, students reported that the immediate access to information enhanced in-class discussion because they could easily search for information to share with small groups or the class: "We can find information online in class and share with one another." The growing number of mobile websites and databases further facilitate the ease with which students can "find examples that were relevant to class topics" and "stumble upon new/various information." Information accessibility augments the ability to connect classroom concepts to real-world applications. Students noted that the iPads allowed them to "apply what [the class was] learning and see it demonstrated in a different way than just lecture." For example, a biomechanics student who used the iPad's accelerometer to graph different patterns of human motion believed that mobile technology "helped link examples and apply information [from class] to real movements." Likewise an English as a Second Language student benefited from applications that allowed the student "to describe places and give directions using a map." Wide-ranging information access also streamlined the learning process. For instance in the music theory course, iPads singularly satisfied a learning process that requires the ability to play a piano keyboard, practice interval and pitch recognition, access sheet music, record and playback music, and assess accuracy through quick tests. Thus, This study's findings support the literature that suggests today's students desire and benefit from "flexibility and ubiquity, that is, 'anywhere, anytime, and any device' learner engagement" (Cobcroft et al., 2006, p. 21).

In order to maximize the benefits of "anywhere, anytime" information access, instructors must carefully orchestrate and manage in-class activities. As previously cited, instructional design and the implementation of technology chiefly affects student perceptions of learning (Armstrong, 2011, p. 224). To be sure, mobile technology provides seemingly boundless access to information, but "information differs significantly from knowledge," and "[o]nly expert

teachers and professionals can guide novices to construct meaningful and relevant knowledge (particularly at the undergraduate level)" (Guri-Rosenblit, 2005, p. 16). Therefore, when students gain access to vast amounts of information, educators must provide direction and aid lest students become lost or overwhelmed. It is vital for educators to carefully test and curate reliable resources and to evaluate the validity of the information available within any given application. Educators must cultivate mobile information literacy in students so that they might make better evaluations and judgments when accessing information on their own. Furthermore, without innovative activity design, mobile tablets may simply repackage old content and mimic ineffective learning approaches (Corbell & Valdes-Corbell, 2007). In order to maximize the benefit of mobile tablets, educators must carefully adapt the technology to specific learning goals and outcomes.

Third, it appears that one way to capitalize on information access for learning is to maximize the collaborative potential of mobile tablets. iPads are suited for collaborative learning because the devices allow for easy viewing and sharing of online resources, and they encourage interaction between group members. Using iPads as the mobile device, this research follows up on criticisms of mobile devices for their small screens and potential for collaboration with shared digital displays (Yang & Lin, 2010). The 9.7 in (250 mm) diagonal screen size and portability of mobile tablets make them ideal for small group discussions and interactions. They are as easily shared among students as a paper notebook or textbook and are less cumbersome than sharing a laptop. If students are grouped around desks or a table, they do not have larger devices creating physical barriers among them. They also have enough space for other class materials, as needed. More important, mobile technologies can be synchronized to one another through wireless networks. They offer the ability for students to collaborate across devices on a single project through a shared screen.

iPads also promote a collaborative learning environment due to the proliferation of mobile apps programmed for cooperative use. Faculty members on the research team found many applications that capitalized on the collaborative potential of the iPad design, and the number of applications that support collaborative learning and shared knowledge creation continues to grow. For example, classes in Communication Studies and English as a Second Language used Popplet, a concept mapping application for both web and iPad. Students created a concept map that was saved online and then invited other iPad (or web) users to contribute to the map. When users wirelessly connected several iPads to collaborate on the same map, they could all share a digital board and update the creation in real time. Together, access to information and the collaborative potential of mobile devices enable educators to maximize learning that intentionally connects educational content to real-world application.

Paradoxically, the collaborative benefit of mobile technologies is enhanced by individual ownership. Our research suggests that the benefits of collaboration and information access are diminished when students do not have access to individual devices or when they do not own the devices. In some cases multiple faculty conducted iPad activities on the same day, which resulted in fewer iPads per classroom, and consequently, students often shared devices in a classroom. In some cases, this limitation highlighted the importance of mobile technology design for collaborative learning. In other cases, the lack of ownership proved frustrating for students. Students established stronger group connections and reported stronger collaborative learning when each person had control over a mobile device. Given the trend toward mobile technology use, faculty must continue to discover the advantages and applications of mobile devices for collaborative learning activities.

Fourth, mobile technology appears to be versatile and highly adaptable for many learning styles and preferences. Mobile technology offered a change from more standard lecture and discussion-based activities in college classrooms. Students predominantly agreed that the iPads helped them "participate in the course activity in ways that enhanced" learning ($m = 4.188$, $sd = 0.809$). In order to maximize this potential, faculty must carefully design lesson plans and select applications that appeal to multiple styles of learning and that allow new and varied styles of content delivery. These multi-modal activities may be strengthened when assigned to groups because the use of iPads complements both the collaborative nature of group work and the multiple learning styles that may be present in a given group. For example, when using the iPads, students can access visual material such as videos or photographs online and then incorporate these materials into notes or charts using apps in an activity that appeals to tactile, visual, and auditory learners.

Students identified unique visual learning opportunities afforded by activities using the mobile tablet. The blend of lecture, discussion, and visual content on the iPad helped the following student connect to English language content in a course for non-native English speakers: "The first thing, it helped me to motivate to listen the class content. I believe visual things help students to learn better, if they use it individually." Another language learning example is applications like multi-sided "flashcards" that include words, pictures, and sounds. Likewise, students studying the physics of human motion benefitted from the visual display of acceleration and movement using the iPads accelerometer: "Being able to see the graphs that correspond with velocities, forces, heights, etc. helped me to understand the concepts rather than just imagining what would happen." Another student reported, "[the] iPad kept me involved to where I was learning and getting visual representation at the same time."

Mobile technology benefited aural learners most obviously in the music classroom. One student reported, "Working with the iPad helped my aural skills in terms of identifying intervals and chords. Practicing on the iPad was more efficient than practicing as a class." In a class where some students may take longer than others to learn pitches and intervals, there are clear benefits to a mobile device with sound and headphones that allows in-class, between-class, and at-home practice with immediate feedback. A music student included in the study explained that an ear training application proved beneficial because "you can move at your own pace, so if you need to drill something over and over, you can do that without holding up the class." Another music student wrote, "It helped because it made repetition so easy within the musical apps. It also helps because it randomizes the questions for you, something you can't do by yourself." The application of the mobile tablet in music classes allowed for a unique blend of individual practice and classroom interaction that suited for the needs of the learning environment.

B. Mitigating the Limitations of Mobile Technology.

Corbell and Valdes-Corbell (2007) warn that mobile learning may offer advantages for tech-savvy learners; yet, they also present challenging learning curves for non-technical students (p. 54). This study both supports and challenges this observation. Despite survey data that indicated most students agreed that an "iPad was more convenient compared to a desktop or laptop computer" ($m = 3.942$), this prompt also featured the second largest variance ($sd = 1.119$) and some students expressed discontent with the time taken for learning the new devices. These findings challenge literature that suggests tech-savvy, "millennial generation" students possess advanced "digital literacy" or an "information technology mindset" (McMahon & Pospisil, 2005;

Oblinger, 2003; Oblinger, 2004). While students may have proficiency with a specific technology or function such as playing music or chatting via smart phones, students do not always possess the refined critical thinking skills that would allow them to adapt this knowledge to other devices and uses.

Educators must continually gauge students' level of knowledge and comfort with new information and communication technologies, and they must not assume that students are prepared for new technologies. This study found that it is essential to devote some classroom time to allow students to acclimate to the devices. In order to enhance students' feeling that mobile technologies are "easy to use" the study team incorporated 10-15 minutes of "play time" in any class using new mobile technologies for the first time. Allocating time for students to experiment with the devices, navigate to different applications, and help one another with interface questions appeared to mitigate frustrations with the learning curve. This small block of time for self-teaching and peer-assistance significantly decreased the number of questions and distractions related to functionality and appeared to improve the students' perception of convenience. In addition, the frequency of classroom use became an important factor in students' response to the devices. Students who used the iPads only once or twice during the semester struggled more than those who used them regularly throughout the semester. In order for the experience to be positive and productive, students needed to feel comfortable with the iPad and the applications. The potential disparity in technological acumen, however, provides an opportunity for student empowerment and encouragement. Faculty can rely on tech savvy students as peer educators. Inviting these students to help orient their peers and permitting them to share knowledge about mobile devices with other students may inspire higher engagement and confidence. In the long run, this learning curve could also prove to be an added value to a student's education, rather than a detriment.

Although the novelty of the iPads initially appeared to be an opportunity for enhancing student excitement and engagement, this feature quickly became a limitation without clear activity design. In classes where students used the iPads without a clear purpose, the devices became more distracting than "fun". Therefore, it is essential that educators design activities with clear instructions and student roles. Unstructured learning activities create idle time that allows students to lose focus and explore games or other interests on the Internet. These distractions impacted both group discussion and lectures. In this way information access becomes a detriment to learning when students become too consumed with the learning tool. When the balance of attention shifted heavily toward the iPad and away from classmates and professors, students reported diminished learning. Instructors should set "rules" for iPad classroom use and manage the students' engagement with the devices. This may mean that the instructor needs to move around the room answering questions, monitoring student activities, and requiring students to close iPads when not using the devices for class work.

Although "convenience" emerged as a strong theme that supported iPads in the classroom, many students reported trouble with the keyboard and typing interface. This discrepancy could be due to the types of activities students were asked to complete in different courses. In classroom activities that required more text input, the sense of convenience may have diminished while the frustration over the use interface increased. However, in classes that used mobile technology for Internet searches or that used activity-specific applications, such as ear training for music or physics graphing tools in human motion, the sense of convenience may have increased. This study's preliminary findings suggest that faculty should be attentive to avoid activities that require large amounts of typing. Until the typing interface improves or until

more students are familiar with the dexterity required for touchscreen typing, the mobile technology is best served for activities that require limited text-input and typing.

The largest impediments to learning and strongest challenge to the "convenience" of the devices appeared to be wireless connectivity and the stability or reliability of applications. This reaffirms the earlier observation that failure of Wi-Fi leads to disenchantment with mobile devices, as applications using Wi-Fi often have the potential of being the most useful (Wang, Wiesemes & Gibbons, 2012 p. 573-74). These recurring critiques in student responses only bolster our previous observations about the learning benefits of mobile technology including the importance of collaboration, the ability to sync devices, and the quick access to information: when connectivity troubles prevent these outcomes, the devices severely hamper the learning process and detract from the classroom environment. While this downside to mobile technology is largely outside of faculty control, administration at an institutional level must insure that they are making plans to improve the wireless infrastructure of their university, particularly in classroom spaces. As mobile technology continues to grow and develop, colleges and universities cannot be caught with a wireless infrastructure incapable of handling the demand for connectivity. For their part, educators should ensure that their classroom spaces receive strong Wi-Fi signals or they should avoid activities relying on heavy Internet access. Furthermore, faculty who rely on available apps to craft educational activities will find that some applications crash or become unstable with heavy use. Many applications must be purchased for US$0.99 to US$14.99 or more. If students have their own mobile devices, faculty must weigh the benefits (and ethics) of requiring students to purchase applications that may not prove valuable beyond the scope of a given assignment or class activity.

VI. Conclusion.

New technologies develop rapidly; the pace only appears to be quickening. Guri-Rosenblit (2005) observes that our human capacity to respond to and adapt to the pace of new technologies is significantly slower and more limited. Therefore, educators using iPads or other mobile devices in the classroom must be committed to learning how to use devices effectively in classroom instruction and to working through the learning curve associated with new technology. Toward that end, this study offers preliminary findings and observations on the use of mobile tablets (specifically iPads) in the classroom as well as student perceptions of the learning environment and their engagement when these devices are introduced to the classroom. The interdisciplinary nature of the research team work and the multiple uses of mobile tablets across different teaching styles, subject matter, student profiles, and more lends strength to the observations in this study. They are not isolated case studies tied only to one classroom, but broader observations and visions for the implementation of mobile learning. However, several factors limit the observations in this study.

First, this study is limited by the exclusive use of the Apple iPad 1. While the study team believes the observations and findings regarding mobile tablets are applicable to the rapidly growing number of devices on the market, additional research that moves beyond branded technologies is necessary. Second, as this study used convenience sampling, the extent to which results can be generalized may be limited by the nature of the population and the unique setting. For future studies, researchers should consider a random sampling method or replicating this study in an alternative setting to increase external validity. Third, this study did not include ownership of mobile tablets. Guri-Rosenblit (2005) notes the paradox that complex information

and communication technologies with extensive functions and uses are mostly employed as "add-ons" in a traditional classroom. Indeed this study typifies this paradox. Because the learning activities in this study were almost wholly classroom based and mainly limited to individual class settings, students did not have opportunities to pursue more complex activities or use the devices in their own time. As discussed above, ownership of the technology appears to be a key factor in how well students learn and use the learning tool. The literature suggests that mobile learners desire the ability and flexibility to choose their location and time for learning (Cobcroft et al., 2006). Greater access to personal mobile tablets might allow learners greater opportunities to collaborate with others and construct knowledge in real world experiences in their daily lives. Some smaller, private institutions have provided iPads or other mobile devices to incoming students in the past two years (Johnson et al., 2011). An iPad for every student is not practical for many schools, particularly universities with large enrollments or state funded schools facing substantial budget cuts.

Mobile tablets entered the market in 2010; thus, the research into mobile tablets is only beginning. The limitations of this study point toward future research possibilities. Future work should study the learning habits and practices of students who own mobile tablets and have incorporated these tablets as their primary resource for learning. Focusing on such "power users" may reveal greater insights as to the possibilities for educational use. In addition, although the interdisciplinary nature of this study is a strength for a broad overview of mobile tablets in the classroom, future research should isolate specific uses of mobile tablets. For example, how do students respond to e-texts on mobile devices? Do students learning a second language benefit from using translation applications or using mobile tablets for auditory, oral, and writing practice? Since mobile tablets may not suit every learning style or every content area, additional research is needed that might isolate disciplinary strengths and weaknesses.

This study is also limited to student perceptions of learning and engagement. The interdisciplinary nature of this study made assessing student learning outcomes difficult due to the varied expectations and learning outcome measures from the arts and humanities to the hard sciences. Therefore, future research should include discipline specific studies that measure how mobile technology effects specific learning outcomes. For example, would using an iPad to research a public speaking topic, to watch and discuss public speaking examples in class, and to collaborate on public speaking outlines result in better speech performance or deeper understanding of public speaking skills? Or do music applications designed to practice pitch and interval identification help music students learn these skills more effectively? Future research should also include comparative analyses of student work and learning outcomes between courses and semesters where one set of students used the mobile tablets and one set did not, but the course requirements and assignments otherwise remained the same. Finally, Dew (2010) observes that more and more working adults are returning to school in order to expand their knowledge base and skill sets. Future research should also consider whether the opportunity to engage emerging technologies such as mobile tablets—or whatever the next technological advance may be—will help these students be more competitive and adaptable despite initial frustrations as they learn to navigate the technology.

In addition to specific studies on learning outcomes, future research might also investigate how mobile tablets improve or enable faculty work. Do they facilitate faster or more educative feedback on assignments? Do features such as voice recording or dictation applications that transcribe speech prove to be valuable methods for faculty to respond to student work? Future research might also include collaborative efforts between faculty from any discipline

working in partnerships with departments such as Computer Science or Informatics to help students design course or content specific applications that might capitalize on the convenience of mobile technologies for a course or discipline. Although design features such as text input caused frustration, those obstacles appeared to be outweighed by the advantages of multiple modes of learning. Therefore, working with application design teams to refine learning apps and develop interactive learning platforms may prove valuable.

In sum, mobile information and communication technologies such as tablet computers will feature prominently in the future of learning and classroom environments. Mobile tablets such as the iPad offer benefits such as seemingly boundless access to information and advantages for collaborative learning. However, these devices also carry the potential to distract learners and create frustration in the classroom. When incorporated into the classroom prudently and reflexively, educators can maximize their potential to enhance learning and minimize their interference with learning.

Acknowledgments

Appendix

You are invited to participate in a survey to get your feedback on the effects of using iPads in the classroom. Your participation is completely voluntary and anonymous. Whether or not you complete this survey will have no bearing on your grad in this class. You may choose to skip any question you do not want to answer and stop completing the survey at any time.

Select how strongly you agree or disagree with the following statements.

The iPad activity (OR a specific application) helped me	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. apply course content to solve problems.					
2. learn the course content.					
3. connect ideas in new ways.					
4. participate in the course activity in ways that enhanced my learning.					
5. develop confidence in the subject area.					
6. develop skills that apply to my academic career and/or professional life.					

Select how strongly you agree or disagree with the following statements.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
7. The iPad activities motivated me to learn the course material more than class activities that did not use the iPad.					
8. I participated more in class during the iPad activities than during activities that did not use the iPad.					
9. My attention to the task(s) was greater using the iPad.					
10. The iPad was more convenient compared to a desktop or laptop computer.					
11. It was easier to work in a group using the iPad than in other group activities.					
12. iPad activities are an important supplement to this class.					

13. Describe how the iPad activity helped or limited your learning of the class content.

14. Describe at least two things you liked about using iPads in this class:
1.

2.

15. Describe at least two things you disliked about using iPads in this class:
1.

2.

16. Do you have any suggestions for other ways to use the iPads in learning class content?

Tell us about yourself.

17. Age:	Under 18	18-28	29-44	45 and over
18. Gender:	Female		Male	

19. Before using iPads in this class, what was your comfort level using handheld mobile
    computing devices?
    [ ] Not at all comfortable
    [ ] Not very comfortable
    [ ] Fairly comfortable
    [ ] Very comfortable

20. After using iPads in this class, how likely are you to use a handheld mobile computing
device for e-learning or professional development.?
    [ ] Not likely
    [ ] Somewhat likely
    [ ] Likely
    [ ] Extremely likely
    [ ] Unsure

21. Considering face-to-face classes that use e-learning technology [such as handheld devices,
online research guides, Oncourse, or other course management systems] in the classroom which
of the following best fits your preference?
    [ ] Classes that make little or no use of e-learning technology.
    [ ] Classes that use a moderate amount of e-learning technology.
    [ ] Classes that make extensive use of e-learning technology.
    [ ] No preference.

22. Do you own a handheld mobile computing device that is capable of accessing the Internet
    (whether or not you use that capability)? Examples include iPhone, BlackBerry, other
    Internet-capable cell phone, iPod touch, PDA, iPad, Kindle, etc.
    [ ] No, and I don't plan to purchase one in the next 12 months.
    [ ] No, and I plan to purchase one in the next 12 months.
    [ ] Yes.
    [ ] Don't know

23. If yes, how do you use handheld mobile computing devices? Check all that apply.
    [ ] Access Oncourse
    [ ] Access other e-learning tools
    [ ] Browse the Internet
    [ ] Download and listen to music
    [ ] Download and listen to podcasts/audio books
    [ ] Download and read e-books/print-based content
    [ ] Download and view streaming movies/video clips

[ ] Make phone calls
[ ] Play interactive games
[ ] Search for information
[ ] Send and receive e-mail
[ ] Send and receive instant messages (IMs)
[ ] Send and receive pictures (MMS)
[ ] Send and receive short text messages (SMS)
[ ] Use camera to take and share pictures
[ ] Banking
[ ] Calendar
[ ] Maps
[ ] News
[ ] Shopping
[ ] Social networking
[ ] Sports
[ ] Twitter
[ ] Weather
[ ] YouTube
[ ] Other. Please specify: _____

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APA, Meet Google: Graduate students' approaches to learning citation style

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Abstract: Inspired by Perkins' Theories of Difficulty concept, this exploratory study examined the learning patterns of graduate students as they grappled with using the style sheet of the American Psychological Association (APA). The researchers employed task performance analysis of three APA formatting tasks, interviews, and observation during a "think aloud" task to gather information on students' misconceptions and successes. The study was able to document in detail how a group of Internet-savvy students approach the use of a style sheet. Learning APA style was found to be a matter both of overcoming conceptual blocks and personal style preferences. Once understanding of genre and conventions that may be inconsistent with prior experience and with each other are attained, motivation, patience, persistence, and attention to detail are also needed to achieve high levels of performance.

Keywords: citation error, skill learning, APA style, graduate students

I. Introduction.

What seemed to be a straightforward task in a doctoral proseminar—formatting references in American Psychological Association (APA) style—turned into a frustrating experience for both instructor and students. Puzzled by the poor performance of talented students on a routine exercise involving correcting bibliographic citations, we undertook a study of the reasons for these challenges.

Given the context, it was easy to avoid assuming that the students were lazy or unmotivated or did not consider the task important, possibilities that normally came to mind when encountering students' citation errors. This group of students was clearly eager to show their proficiency, take their new program seriously, and impress their peers and instructor. They were in the early phase of graduate student adjustment (Weidman, Twale, & Stein, 2001), lacking confidence, but trying very hard to show the institution that it had not made a mistake in accepting them into the program. Within the group, there was a competitive ethos, a seriousness about study and grades that is characteristic of new doctoral students. Thus, inquiring into the difficulties that serious students have with an apparently simple task was at the heart of this study. We framed our main research question as "What factors are associated with errors that new graduate students make in using APA style in citation lists?"

Learning a citation style like APA is important as it helps in academic and research activities such as retrieving documents for verification of data and building credibility as author(s) (Faunce, & Soames, 2001; Spivey, & Wilks, 2004; Sweetland, 1989). Citation styles, such as APA, have evolved through peer-consulted agreements within discipline-oriented

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communities of practice. Such agreed norms and ethics in research and publishing need to be followed by authors (Waytowich, Onwuegbuzie & Jiao, 2006) to ensure the continuation of agreed practice, and therein lies another importance for learning citation styles.

II. Conceptual Framework.

Initially, we were inspired by the work of David Perkins (2008), who advocates abandoning common initial reactions to student mistakes, such as blaming the learner (for laziness, poor study habits, etc.), settling for a formulaic fix (teach harder, use repetition, etc.), and focusing on the topic rather than the symptom and the symptom rather than the cause (how is the difficulty manifesting itself and what is it about the nature of the task and students' actions that are connected to the difficulty?) The approach aims at reaching a deeper understanding of student difficulties that transcends immediate applications to the problem at hand—in our case, students' inability to apply APA style to citation lists. Perkins' ideas are aligned with the scholarship on scientific misconceptions and other approaches that center on cognitive bottlenecks.

When we continued to search for a specific type of conceptual blockage that might be connected with applying APA style, however, we recognized, with the help of a peer, that style sheets are arbitrary in some ways and are patterns to follow, rather than internally consistent logical systems. For this reason, we were grateful for Perkins' advice about seeking deeper causes and wanted to continue to be sensitive to cognitive areas, but turned from the idea of conceptual blockages to a theoretical framework of social cognitive theory, which focuses on skill learning, or the application of rules to particular situations. Svinicki (2004) describes the task of social cognitive learning as students' creation of mental images of the sequences involved in making the desired application of a particular skill. She emphasizes the importance of modeling, practice, and feedback in this kind of learning. In addition, we included in our framework considerations of motivation and transfer, which Svinicki stresses are intertwined in skills learning. In such an exploratory study, we wanted to keep ourselves open to entertaining several theories that might be applicable.

III. Literature Review.

An initial search of the literature failed to reveal a study that focused on the specific topic of learning the APA style sheet. We did discover studies that focused on rates of citation errors in general (Garfield, 1990; Sweetland, 1989) and specifically in Medicine (Asano, Mikawa, Nishina, Maekawa, & Obara, 1995) and in Education (Jiao, Onwuegbuzie, & Waytowich, 2008; Waytowich, Onwuegbuzie, & Jiao, 2006). These studies found that very high rates of errors are common. Across these studies, citation errors ranged from 22%-51% in the samples studied, with most around 30%. Garfield found that many errors occurred when authors copied from other citations rather than the original document. These studies argue that one of the reasons for poor citation style and inattention to accuracy is that these skills are not formally taught. Two of these studies explored the relationship between personal characteristics and performance on APA citation style tasks. Waytowich, Onwuegbuzie, and Jiao found that student perfectionism is associated with high performance on citation style tasks. They documented the disconcerting finding that performance actually deteriorated rather than improved over time as graduate students advanced, suggesting that perhaps complacency or lack of correction by other instructors is to blame. Jiao, Onwuegbuzie, and Waytowich found an association between

library anxiety and APA citation style performance. In this piece, they claim that the Waytowich, Onwuegbuzie, and Jiao study is the first to explore relationships between APA errors and author characteristics, documenting the lack of studies on this topic.

Turning to social cognitive theory, we found Svinicki's summaries (2004, 2010) helpful in applying early work on social learning theory by Bandura (1986) to college teaching. In teaching intellectual skills, Svinicki stresses the roles of "cognitive apprenticeship" (Collins, Brown, & Newman, 1989) and prior knowledge, emphasizing that as learners watch another demonstrate a new skill, they construct a mental model of the process and then with practice and feedback, are able to make applications to other like instances. Awareness of their own processes (metacognition) aids in this activity. Svinicki also discusses the importance of such motivational theories as expectancy/value theory (Eccles, 1983), which alerted us to explore whether the students felt the task worthwhile and felt confident that they could master APA style.

A final strand of literature that seemed of possible relevance was the literature on learning styles. In particular, we looked at the idea of field independence and field dependence (Witkin, Moore, & Goodenough, 1977) as a possible explanation for why some students were more prone to notice details than others. This theory posits that people vary in the extent to which they tend to perceive the overall "big picture" (field independent) or notice the smaller components (field dependent).

The relative lack of prior work on the issue of learning citation style, coupled with a variety of possible explanations to consider, were factors prompting our exploratory approach. In short, we wanted to know whether cognitive confusion, poor mental imaging, motivation, personal style, simple lack of practice, or some combination of these factors were to blame for APA citation style errors.

IV. Methods.

The Proseminar enrolled 12 students, one of whom assisted in designing this study. For that case, we used only the students' assignments, but did not include her as a study participant in subsequent data collection efforts. After obtaining Institutional Research Board approval, we first assigned numbers to the cases of the 12 students and assembled their work products: an initial assignment that involved identifying citation errors in a list of 26 entries, and the reference list they submitted with the literature review assignment for the course. Each assignment was labeled with the student's number. A list of numbers and corresponding participant names was kept in a separate file.

Our initial step was to analyze patterns of error on the first assignment, which involved correction of errors in an instructor-generated reference list. We created spreadsheets for each student and created coding categories, noting when they had failed to detect a citation error or inserted an erroneous correction. All three coders worked independently and then reconciled their coding. The data from these spreadsheets were aggregated and individual and group percentages were calculated.

We next did similar coding of errors with the student-generated reference lists from the literature review assignment, coding errors by category. Again, we coded separately and reconciled differences. Because the lists varied in the number and type of citations used, we calculated percentages based on error rates per citation.

We next held interviews with each student on their basic approach, perceptions of the importance of APA style use, and preferred working style. Notes from each interview were then coded and entered into a database for analysis.

Finally, we observed students as they completed a "think aloud" task involving composing three reference entries in APA style from source items. Students were asked to talk as they worked, telling us their reasoning process. They were encouraged to use any resource they would normally use. Our notes from these sessions and analysis of the resulting citations were coded and entered into the study database. Scores on the citation task were arrived at by agreement of two coders and calculated on the basis of error rate per citation.

V. Findings.

Our explorations yielded important understandings on the thought processes and habits that students used in routine APA tasks, "logical mistakes" they made, their understandings of their own thinking processes (metacognition), and preference for digital rather than print resources. They also supported the efficacy of repeated practice in learning a skill. We will first discuss the results of students' performance; then, describe their strategies and other factors that affected performance.

A. Performance Results.

Student performance on the three APA tasks analyzed for this study had been preceded by a classroom demonstration of APA citation applications using slides archived for later student reference and an in-class exercise requiring students to do APA tasks and receive immediate feedback on their performance.

Error correction task. As previously noted, the first task involved noting APA style errors and substituting the correct format in a reference list of 26 items containing 61 errors. Students were able to do this on their own, using whatever resources they chose, following a class session that provided an overview of common citation tasks using APA style. The performance range on this task was quite disappointing, ranging from 20% to 64% accuracy, with a mean of 40%, showing that only 7 of the 12 students recognized and corrected more than half the errors in the list. Most common mistakes included: failure to recognize the genre of the entry (journal, book chapter, etc.); incorrect punctuation with multiple authors (not using both comma and ampersand); incorrect order of month and year when both needed to be used; inappropriate use of capitalization/lower case and italics/Roman in titles; and incorrectly listing city and state of publisher.

Literature review reference list. Students were asked to do a literature review with a reference list in APA style. On this task, the number and type of citations varied according to the sources students identified, so the error rate was calculated on the basis of errors per entry. The number of entries ranged from 7 to 26 with an average of 14. Scores ranged from an error rate of .6 per entry to 3.5. The mean score was 1.8 errors per citation. Common mistakes for this task involved: upper and lower case errors in titles; punctuation after the date; punctuation with multiple authors; order of year and month, and choice of genre. Four of the 12 students failed to indent their lists. In comparing the list of common errors between this and the first task, it must be remembered that the second list was student-generated while the first list was instructor-generated, so citation tasks on the second assignment depended on the students' choice of

references rather than a standard list. The approach was generative rather than reactive as well, which students cited as preferable, largely because it was easier for them to identify the genre of the source when they had the physical source before them. Nevertheless, there are substantial commonalities across the list of frequent errors, showing that students did not transfer much learning from the first task to the second.

Think Aloud task. Students were given two physical publications and one web URL during the interview visit and asked to write the citations, using whatever resources they chose. Errors per citation ranged from 0 to 3, with a mean of 1.2 per citation. Number of total errors ranged from 0 to 10, with a mean of 3.6. Most common mistakes involved genre identification, retrieval language, and capitalization/italicization of titles.

Patterns across tasks. Given that these tasks were performed over the course of two semesters (from the original assignment to the interview), and assuming that students had other opportunities to use APA style in their coursework, we were curious to know what patterns of improvement occurred. Did students seem to learn from their mistakes? To assess this, we looked at data on initially-high error rate tasks, comparing performance on the first, second, and last tasks per student and then in the aggregate. These citation activities involved the following:

- Identifying genre of source (recognizing correctly that the source is a book, journal, etc.)
- Using APA retrieval language (to cite retrieval of World Wide Web sources)
- Appropriately using Roman/Italics or capitalization/lower case, as called for by the situation
- Using correct punctuation for sources having multiple authors

Table 1 shows the average per item performance for the class on these items. Since the second task involved student-generated lists, a few of which did not use retrieval language or atypical genres, the group average does not reflect the performance of each student as evenly as the other lists. Given this condition, particularly with genre recognition errors, one can see a pattern of improvement across all four citation activities from the first to third task. The two more common activities—italics/capitalization of titles and use of punctuation with multiple authors, improved most dramatically, while the less common citations, involving unusual genres and web sources, were still associated with error rates over .5 per entry.

Table 1. Changes in Error Rate per Citation on Common Problem Citations Across Tasks.

	Use of italics/ Capitalization	Genre Recognition	Retrieval Language	Authors (& and ,)
1st Task	0.7	0.9	0.8	0.5
2nd Task*	0.3	0.5	0.8	0.3
Think Aloud	0.2	0.6	0.5	0.1

*Not as standard as the other two tasks since students chose citations to include, meaning that they had either more or fewer citations of these kinds on which to base the error rate.

B. Factors Influencing Performance.

Working from our literature base, we looked at several potential factors influencing student performance on the tasks: student characteristics, their strategies for locating APA style information, their work checking behaviors, their perceptions of the value of the task (intrinsic or extrinsic), their prior knowledge, and their metacognition.

Student characteristics. Interview data on students' self-perceptions of their approaches were examined for possible relationships with performance. Students were asked to rate themselves from 1 to 10, with 10 being high, on four constructs: attentiveness to detail, persistence with APA tasks, perfectionism, and tendency to comply with, rather than question, directions. We grouped students by scores into the categories of high, medium, and low performers on the tasks. Then, we compared ratings on personal attributes to level of performance in order to explore the existence of a relationship. We found that the lowest performers rated themselves lowest of all three groups on their tendency to comply with directions and their attentiveness to detail, while the top performers rated themselves highest on perfectionism and attentiveness to detail. Top and middle group students rated themselves high on compliance relative to the low performers. Interestingly, the lower performers rated themselves most highly on persistence, perhaps due to the time their inefficient strategies take. Observations during the Think Aloud task showed that these students were more likely to jump from one strategy to another and to be unfamiliar with the use of some resources, such as the organization of the APA style manual. The results are summarized in Table 2.

Table 2. Relationship between Self-ratings on Performance. Scale from 1 to 10, with 10=High.

Group Averages	Details	Persistent	Perfectionist	Compliant	Averages
Top Performing	8.3	7.5	8.3	8.0	8.0
Mid Performing	7.6	6.5	6.5	8.3	7.2
Low Performing	7.2	7.7	7.3	6.8	7.3
Whole group	7.7	7.2	7.4	7.8	7.5

Strategies in composing citations. Students differed on whether they used a deductive or inductive approach to composing citations. Differences in approach led to different kinds of errors. Those who worked deductively immediately sought a model to accommodate the information on their source. This method led to problems when they misidentified the genre of the source. A frequent problem occurred with publications that are separately titled volumes in a series. Students who saw these publications as a journal ignored the dilemma of three titles (chapter, volume title, series title) and did not see the need to list the place of publication and publisher. Students who worked inductively from the elements of the source information to a model, however, were prone to make mistakes in copying the information or selecting which elements to use. For example, one student chose the earliest of several copyright dates instead of the most recent. Her reasoning was that one should indicate when the piece was first published. Another copied down extraneous information, such as the publisher's website. The choice of key elements of information dictated choice of model, causing mishaps if the wrong elements were chosen. For some, working from the source became a literal exercise—because the title of the book was listed with main words capitalized, it was copied that way.

Clearly, an iterative approach, moving between information from the source and the model entry is required, but many students seemed unable to move back and forth. Once information had been recorded by those using an inductive approach, they were reluctant to abandon some pieces of information as unnecessary; conversely, once a model had been adopted by the deductively-inclined students, they were reluctant to abandon the model because it did not fit the information. An example of a student using the iterative process was found in the student

who said, "I try not to stop at the first thing [model] that fits, because something better may come down the line." Her colleagues were less likely to do so.

The importance of genre recognition became clear from the start of the study. Students' error patterns were often related to their misperception of how the source material should be classified. While students most easily recognized books, book chapters, and journal articles, they had trouble with separately-titled volumes in a series, conference presentations, and electronic sources. Choosing the wrong category of publication meant choosing a model entry that would accommodate only some of the information available. Many students identified this major decision point about the source—What is this?—as the most difficult aspect of using APA citation style. Yet, the ability to make this decision readily is assumed by the Manual, and alas, was assumed by the teacher in the context of this study.

These two problems—failure to work iteratively and misperception of genre—were responsible for many subsequent issues.

Strategies for locating APA information. Only four students expressed a preference for using the APA manual to locate style information and one student outrightly admitted to never using the manual. All of the eight students who relied on other information sources used either the Internet or print model documents (entries in bibliographies or published sources likes books or journals). Much of the Internet use involved using Google or Google Scholar to locate sample citations, but some involved using sites on APA style conventions published by other users, mostly university centers. APA manual use was associated with middle and top performing students more than lower performing students. We did not find any relationship between use of various Internet methods and performance.

The features of online sources, such as hyperlinks and color coding, were viewed as more user friendly and efficient to the students than the print APA manual. As a less preferred resource, students used the APA manual when they continued to have questions about correctness after accessing other methods. For most, the manual is, as one student said, "So dense with information that I find it overwhelming. I don't have the time to spend more than 10 or 15 minutes to look for a citation." The organization of the manual is not clear to students. As they completed their think-aloud tasks, they frequently struggled with the index and flipped through pages randomly. One student complained that there are not enough examples and that those that are in the manual are basic rather than focused on complicated cases. Another student called the manual "stagnant," saying that it provides whole examples rather than building from individual elements. In observing students using the manual, we noted that they referred only to the examples without reading the explanatory text. They sometimes made errors of interpretation when they did read.

Students expressed, to varying degrees, issues of "trust" in consulting sources. For example, several placed trust in people, such as their professors, who would be able to give them advice on a troublesome entry. They joked about "dialing a friend" while they were doing the Think-Aloud exercise. Most students mentioned that using Google or other bibliographies were risky courses of action. Some students expressed the opinion that refereed journals in the field of education can be trusted since these journals all use APA (an incorrect assumption) while others cautioned that one should not rely on collections such as ERIC or EBSCO to provide citations in APA format. Students generally trusted the online APA style digests that other institutions have compiled (again not always a good assumption) but did not trust their peers to be accurate, often saying that peer review of APA work was not helpful because their peers make as many or more mistakes as they do. One student realized that EndNote does not always format citations

accurately in APA style. In the end, however, the APA manual is viewed as the authoritative source and as such is the final recourse of students who are searching to resolve a difficult citation problem. One student said, "APA is like the Bible."

Students described sometimes using "triangulation" in formatting a difficult entry. They arrayed a variety of examples of a given citation, some from Google Scholar, some from other sources, to judge the "majority opinion," or the differences between the formats used by more- or less-trusted sources before determining which to follow. Often, they would select the version that most closely matched the APA manual example that they judged applicable.

Work checking behaviors. We did not see strong patterns in the checking and refining patterns of students as observed in the Think-Aloud task. Top students were more likely to check the whole entry than checking only parts on which they were unsure, while mid-performing students were more likely to check only troublesome parts. There was no clear pattern with "giving up" or "settling" behaviors by performance group.

Perceptions of value of task. Although one student saw the APA assignments as "mundane" and said that she did not invest much energy in doing the tasks, all of the others stressed that they were motivated to perform well and gave these assignments their best effort. They stressed their understanding of the importance of using proper citation style, sometimes to a somewhat exaggerated level, such as the student who said, "Mistakes like this [citation format errors] are an 'in' for others to question your credibility." She added, "It's really important to avoid 'public mistakes'--you really have to be careful as a scholar." A few students stated that they did not think they would be using APA in their work because they were aspiring to administrative careers in which they would not be doing research and publication.

Prior knowledge. Confidence and experience were factors that influenced student performance on APA assignments. A few participants expressed that they were highly familiar with APA through their previous experience as either undergraduates or master's students in fields using APA style. One was in the middle range on the two tasks that she said she did casually, but did very well in the Think-Aloud task. The other expressed astonishment that her practice had many mistakes, which had never been corrected by professors in past programs. A few participants had been away from formal schooling for several years and cited their lack of practice with formal academic writing as a general challenge.

An issue with prior learning that was experienced by the students in this study, however, was "unlearning" when previous practices had not conformed to APA style. For example, some students had formerly been in disciplines that used other style sheets. Their "memories" told them to put references in numbered lists or to spell out the author's first name. For many, previous instruction in writing as far back as elementary school confused them when they relied on memory. They had been told to capitalize all major words in a title, for instance. These former practices were deeply rooted and often prevented noticing differences with the new style.

"Logic" of errors. Interview comments often illustrated students' reasoning in ways that made good sense. For example, they saw contradictions between authorities:

- "The conventions of Microsoft Office are sometimes misleading, since they will do that "little red underline" for spacing or things, when really that's how APA wants it. It causes me to think I've made a mistake."
- "You were taught in grade school to capitalize main words in a title, to use quotation marks around chapter titles. And leaving no space between a volume and issue number just looks weird. Who can you trust?"

Students also yearned for consistency in searching for a way to remember conventions.

- "I would like for conventions on these to be standardized--sometimes you use a comma and sometimes not. What's the rationale for the difference?"
- "Why is it that the main words in the title of a book are lower case, while those in a journal title are upper case?"
- "Why do you have to list the authors' first name initials last at the start of an entry but first when they are the book editors cited in a chapter citation?"
- "Sometimes page numbers are supposed to be listed with 'pp.' and sometimes not. Why the difference?"
- "It says to use "&" in listing authors in citations and "and" when referring to them in text. It would be easier to just use one or the other consistently, wouldn't it?"

Metacognition. While some students were quite aware of their approaches to using APA style, several appeared to be confused about the match between their stated approach and their actions. In eliciting interview comments from students about how they went about formatting entries, we found that students were able to describe their usual approaches, such as first writing down the pieces of information, then looking for a model. But in several cases, the students failed to follow this approach during the subsequent Think-Aloud task. Generally, students whose descriptions of their approach matched our observations of them were in the higher performing groups, leading us to think that metacognition is important in this learning task.

VI. Discussion.

Our overall appraisal of the usefulness of conceptualizing this study in terms of Theories of Difficulty (Perkins, 2008) is positive, in that it encouraged us to look for rational explanations of errors and misleading conceptions. What first seemed to us a routine task that did not require much mental energy emerged as a more complicated one. While our search failed to identify one key type of conceptual difficulty, it did lead us to explore the many factors involved in this type of skill learning. Working from a Theories of Difficulty approach also helped us to see some student errors as rational: they were made on the basis of a tendency to expect consistency in rules with those of previous authorities and with each other. We also learned that we made some incorrect assumptions about prior knowledge, such as students' ability to distinguish between a monograph series and a journal.

We learned, in accord with social cognitive theory (Svinicki, 2004), that practice seemed to improve performance, showing that familiarity and attentiveness to the task were important success factors. A key recognition, however, was that while performance on some APA style citation tasks seems to improve with practice, others require explicit repeated modeling of elements that seem quirky, complicated, or contradictory to prior experience, which take longer to master.

In addition, students' self-ratings of their personal characteristics showed some relationship to performance. This latter finding is consistent with the findings of Waytowich, Onwuegbuzie, and Jiao (2006) with respect to the positive relationship between perfectionism and performance on APA citation style tasks.

VII. Limitations.

The small sample size, location in one program and one doctoral course, and detailed analysis of three tasks allowed us to explore students' APA citation style learning in depth. Coding and

reconciling among coders was slow and labor-intensive, yet it was feasible for the sample size. These advantages also present limitations. The sample was too small to use statistical methods appropriately and is very context-specific. Results, therefore, can only be transferred by individual instructors on the basis of "fit" with their population and context.

A further limitation is the comparability of the tasks used for the study. The first task involved "working backwards"—looking at citations for errors. It used a standard list of 26 items, involving many types of citation tasks. The second involved generating citations for documenting a paper. Here, students chose the sources and the kind of citation tasks varied from one student to another. In the third task, the Think-Aloud task, the citation tasks were standard, but the conditions under which the students worked—being watched and likely feeling some time pressure—differed from those of the first two tasks. Although we have referred to these differences in the analysis, they make interpretation more complex and tentative.

VII. Implications.

Since the use of APA style is valuable in the literature in not only our discipline but in all who use the popular style sheet(*e.g.* Asano, Mikawa, Nishina, Maekawa, & Obara, 1995; Jiao, Onwuegbuzie, & Waytowich, 2008; Waytowich, Onwuegbuzie, & Jiao, 2006), there are several implications stemming from this study for us and our colleagues:

1. Instructors cannot assume that prior experience or self-discovery are adequate methods for students to learn tasks that seem routine.
   a. In the special case of APA citation style use, instructors need to pay explicit attention to genre recognition skills. Teaching with physical specimens is called for. Students need to know the difference between a continuously-paged journal and one that is not, between a separately-titled volume in a series and a multivolume work. By having students identify various types of sources and helping them to know how to check in cases when they are not sure of the identity of the type of source, instructors can assist them in using APA citation style.
   b. Highlighting common conventions of APA style is not enough as an instructional strategy. It is important for instructors to stress systematic search strategies by walking students through them, noting inconsistencies and highlighting conventions. In line with social learning theory, they also need to provide detailed modeling and repeated practice, encouraging students to compose their own learning journals as they encounter conventions that seem unusual or contradictory to their thinking. Such metacognitive activities will address the individual learning challenges in this area.
2. Colleagues in the program need to share the value of APA style use and reinforce learning. In this study, several students who thought they were using APA style correctly discovered that their previous instructors never pointed out APA style mistakes. It is also common to hear that "ideas are more important than mechanics." Instructors therefore need to support each other in helping students by recognizing the importance of reinforcement on style activities.
3. This study demonstrated that the scholarship of teaching and learning is important in unraveling the causes behind student errors and improving instruction. Looking at patterns of error systematically gave us an appreciation for specific types of errors in APA citation style, but more fundamentally changed our approach to learning challenges,

inspiring us to look more carefully at how students approach learning tasks. Instructors who are systematic in their explorations of student difficulties change their teaching in intentional ways as well as help their colleagues to promote better learning.

We believe that the above issues are not limited to the use of APA style, but are issues likely to appear in any use of a style sheet. It thus crosses academic disciplinary boundaries. We conclude then, that mastering APA citation style is influenced by practice, conceptual issues, and personal style preferences. Once understanding of genre and conventions that may be inconsistent with prior experience and with each other are attained, desire, patience, persistence, and attention to detail are also needed to achieve high levels of performance. These are the tasks involved in socialization to the practices of given discipline; our attention to this basic task can help in broader ways than the simple mastery of a style sheet. Gains in metacognition, attention to detail, self-discipline, and pride in one's work are all involved; style sheets can be the medium for helping our students achieve these goals.

Acknowledgement

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Differences in procrastination and motivation between undergraduate and graduate students

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Abstract: Procrastination became increasingly prevalent among students in recent years. However, little research was found that directly compares academic procrastination across different academic grade levels. The present study used a self-regulated learning perspective to compare procrastination types and associated motivation between undergraduate and graduate students. Sixty-six undergraduate and sixty-eight graduate students responded to a packet of questionnaires concerning their experience in an educational psychology class. The results show that students' beliefs about the usefulness of procrastination were a better predictor of academic procrastination than self-efficacy beliefs and achievement goal orientations. Student age was related to procrastination types. Among the undergraduate procrastinators, the younger students were more likely to engage in active procrastination while the older students tended to engage in passive procrastination. Implications and future research directions are discussed.

Keywords: procrastination, motivation, self-regulated learning, college students

I. Introduction.

Despite considerable research describing negative consequences, procrastination has become increasingly prevalent among university students in recent years (Harriort & Ferrari, 1996; Knaus, 2000; Steel, 2007). Procrastination refers to the lack or absence of self-regulated performance and the behavioral tendency to postpone what is necessary to reach a goal (Knaus, 2000). Procrastination has long been viewed as a self-handicapping behavior that leads to wasted time, increased stress, and poor academic performance (Özer, 2011; Solomon & Rothblum, 1984; Tice & Baumeister, 1997; Wang & Englander, 2010). Research demonstrates that academic procrastination impacts both undergraduate and graduate students.

Over 70% of undergraduate students admitted to procrastinating on their academic tasks (Ellis & Knaus, 1977; Schouwenburg, 1995), while more than 50% of them procrastinated consistently and problematically (Day, Mensink, & O'Sullivan, 2000; Ferrari, O'Callaghan, & Newbegin, 2005). Most recently, Klassen, et al. (2010) reported that about 58% of their undergraduate participants "report[ed] spending three hours or more per day in procrastination" (p. 372). Solomon and Rothblum (1984) found that undergraduate students procrastinated more often when writing term papers (46%) than when reading weekly assignments (30%) and studying for examinations (28%); and that (self-reported) fear of failure and task aversiveness were the two main reasons why undergraduate students procrastinated. Research shows that undergraduate student procrastination is related to gender, laziness, and difficulty in making decisions (Özer, Demir, & Ferrari, 2009; Schouwenbury, 2004), perfectionism and control

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(Burns, Dittmann, Nguyen, & Mitchelson, 2000), and the ability to resolve role conflict between school and interpersonal relationships (Senécal, Julien, & Guay, 2003). Studies consistently show positive correlations between procrastination and undesirable behaviors or affective outcomes, such as failure to complete assignments, lower grades, low self-esteem, and higher stress (Ferrari, 2001; Schraw, Wadkins, & Olafson, 2007; Tice & Baumeister, 1997).

Academic procrastination is also a severe problem for graduate students (Collins & Veal, 2004; Jiao, DaRos-Voseles, Collins, & Onwuegbuzie, 2011; Onwuegbuzie & Jiao, 2000). Disturbingly, Onwuegbuzie (2004) found that graduate students tended to procrastinate more than undergraduate students. In graduate students, procrastination was associated with (self-reported) fear of failure, task aversiveness, reading ability, self-efficacy (Collins, Onwuegbuzie, & Jiao, 2008), and various types of academic-related anxiety (Onwuegbuzie, 2004; Onwuegbuzie & Collins, 2001; Onwuegbuzie & Jiao, 2000). Procrastination has a negative impact on graduate students' academic achievement (Onwuegbuzie, 2000) and grade point averages (Prohaska, Morrill, Atiles, & Perez, 2000).

Research also shows that undergraduate students perceive their procrastination tendencies are a barrier to academic success in college (Fritzsche, Rapp & Hickson, 2003; Kachgal et al., 2001). Similarly, between 65 and 75% of graduate students wanted to decrease their procrastination (Onwuegbuzie, 2004). Despite students' motivation and extensive research efforts to curtail this debilitating habit, academic procrastination has become increasingly prevalent, which suggests that procrastination is not entirely understood, and more research is needed (Kachgal, Hansen, & Nutter, 2001; Steel, 2007).

As seen, an extensive body of research has examined the prevalence, reasons, and consequences of academic procrastination in undergraduate and graduate students. Surprisingly, no study has directly compared procrastination in undergraduate and graduate students, except Onwuegbuzie (2004) and Özer (2011). Onwuegbuzie (2004) reported that graduate students demonstrated an even greater tendency to procrastinate on academic tasks (3.5 times in keeping up with weekly reading assignments and 2.28 times in studying for examinations) than undergraduate students (Onwuegbuzie, 2004). However, Onwuegbuzie's (2004) findings were based comparison of the graduate student data he collected recently with the undergraduate student data that Solomon and Rothblum (1984) observed two decades ago. Onwuegbuzie's (2004) approach to data collection and analysis raised a concern that the prevalence of procrastination among the current undergraduate students might be underestimated, since frequency of procrastination among the undergraduate students has increased in the past two decades (Harriort & Ferrari, 1996; Knaus, 2000, Steel, 2007).

Contrary to Onwuegbuzie's (2004) findings, Özer (2011) found that undergraduate students claimed to procrastinate more than graduate students on studying for exams, writing term papers, and reading weekly assignments. The inconsistent findings of Onwuegbuzie (2004) and Özer (2011) suggest that more research is needed to study similarities and differences of procrastination in undergraduate and graduate students.

In addition to the methodological concern, the present study expanded the earlier focus on the nature, antecedents, etiology, and consequences of academic procrastination (Knaus, 2000; Sommer, 1990; Steel, 2007). More recently, this research has shifted its focus from treating academic procrastination as a self-defeating personality flaw (Ferrari, 1991; Lay, 1990; Milgram, Dangour, & Raviv, 1992; Schouwenburg, 2004) to viewing academic procrastination as a complex phenomenon with cognitive, affective, and behavioral components (Rothblum, Solomon, & Murakami, 1986; Schraw et al., 2007; Wolters, 2003).

As a result of this conceptual shift, recent research stressed that motivational and cognitive factors must be considered together to understand academic procrastination (Howell & Buro, 2009; Muszynski & Akamatsu, 1991; Steel, 2007). For instance, Lee (2005) reported that intrinsic motivation had significant unique effects on procrastination. Brownlow and Reasinger (2000) found that low extrinsic motivation, together with perfectionism, external locus of control, and attribution style contributed to the tendency of delaying school tasks. Howell and Buro (2009; Howell & Watson, 2007) investigated how academic procrastination was correlated with beliefs, ability, achievement goals, and learning strategies. Senécal et al., (1995) examined the extent that academic motivation predicted academic procrastination and they concluded that procrastination is a motivational problem that involves more than poor time management skills or trait laziness.

These results demonstrate that ascertaining student motivation associated with academic procrastination would contribute to a better understanding of academic procrastination and ultimately lead to effective interventions to reduce its negative impact on student learning. However, no research study has directly examined similarities and differences in motivation of academic procrastination between undergraduate and graduate students. The present study addressed this gap by comparing procrastination and motivation of undergraduate and graduate students simultaneously. To facilitate the comparison, two different types of procrastinators were distinguished: passive procrastinators and active procrastinators.

Academic Procrastination

Recent research noted that not all forms of procrastination lead to negative consequences and examined the adaptive values associated with procrastination (Bernstein, 1998; Ferrari, 1991; 1994). This research shows that procrastination is related to intrinsic motivation (Senécal et al., 1995). Students reported that course materials become less boring, more interesting, and more engaging when they procrastinate (Schraw et al., 2007). Other benefits of procrastination include freeing up time for planning and other activities, more concentrated effort, a greater sense of challenge, and peak experience immediately prior to exams (Knaus, 2000; Lay, Edwards, Parker, & Endler, 1998; Schraw et al., 2007). Furthermore, procrastination does not necessarily affect the quality of performance. For instance, Solomon and Rothblum (1984) found that there was no relationship between students' procrastination scores and their course grades. Similarly, Ferrari (1992) reported that procrastination scores were positively related to academic behavior delays but unrelated to exam scores. Pychyl, Morin, and Salmon (2000) concluded "Our results do not support the findings of previous research in this regard. There was no significant difference in exam performance between those students scoring high versus low on procrastination, despite the differences in the amount of time studied and onset of studying" (p. 147). These results suggest that procrastinators may also include those who choose to delay a task for the adaptive values of procrastination.

In line with this alternative view, Chu and Choi (2005) distinguished passive procrastinators and active procrastinators. *Passive procrastinators* were those who did not intend to procrastinate, but they often ended up postponing tasks because of their inability to make decisions quickly and to thereby act on them quickly. *Active procrastinators* were significantly different from passive procrastinators described in the traditional sense (Knaus, 2000; Senécal et al., 1995; Steel, 2007). Active procrastinators procrastinated because they preferred pressure and often used procrastination as a deliberate self-motivating strategy in order to be adequately

motivated (Ferrari, Johnson, & McGown, 1995). Because of their intention to accomplish the task and their ability to meet deadlines and produce satisfactory outcomes, the active procrastinators were believed to possess characteristics similar to non-procrastinators in managing their learning (Chu & Choi, 2005; Choi & Moran, 2009). The concept of active procrastination was included in the present study in order to examine the possible differences in procrastination and motivation between undergraduate and graduate students. More specifically, inclusion of active procrastination allowed the present study to examine whether active procrastination is associated with adaptive motivation factors, and whether active procrastinators actually performed better than passive procrastinators and non- procrastinators.

Self-Regulated Learning Perspective

The present study used a self-regulated learning perspective (Pintrich, 2000; Zimmerman, 2008) to examine how procrastination is related to motivation in undergraduate and graduate students. Self-regulated learning is described as an ''active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behavior, guided and constrained by their goals and the contextual features in the environment'' (Pintrich, 2000, p. 453). The self-regulated learning perspective was selected because it focuses on motivational, cognitive, and metacognitive processes of student learning (Pintrich, 2000; Wolters, 2003; Zimmerman & Schunk, 2001). Guided by this framework, the present study examined whether active and passive procrastinators possess distinctive characteristics in self-efficacy, metacognitive beliefs, and achievement goal, as well as test performance in undergraduate and graduate students.

Self-efficacy. Self-efficacy refers to students' judgment of their capability to accomplish tasks and succeed in activities (Bandura, 1986, 1997). Bandura (1986) was the first to introduce the association between procrastination and self-efficacy beliefs. He posited that students possess the capabilities to regulate their thoughts and actions by reflecting on the outcomes of their learning process. However, students who were skeptical of their ability to exercise control over their behavior tend to undermine their own efforts to deal effectively with situations that challenge their capabilities (Bandura, 1986). Existing research supports Bandura's (1986) position that self-efficacy plays an important role in task initiation and persistence (Pintrich, 2000; Schraw et al., 2007; Schunk & Pajares, 2005).

An inverse relationship was found between self-efficacy belief and academic procrastination among college students (Ferrari, Parker, & Ware, 1992; Tuchman, 1991; Wolters, 2003). For instance, Tan et al., (2008) reported that self-efficacy for self-regulated learning was negatively correlated with procrastination. High self-efficacy for self-regulated learning also predicted students' expectations of doing well; low self-efficacy for self-regulated learning predicted students' expectations of not doing well academically. Similarly, Seo (2008) found that self-efficacy fully mediated the relationship between self-oriented perfectionism and academic procrastination, and that students with high self-oriented perfectionism procrastinated less than others. Furthermore, Chu and Choi (2005) found that self-efficacy was correlated negatively with passive procrastination, but positively with active procrastination, and that passive procrastinators had significantly lower self-efficacy than the active procrastinators. Exploring differences in the relationship between procrastination types and self-efficacy among undergraduate and graduate students would clarify how student judgment of academic capabilities influenced the tendency to procrastinate at different levels.

Metacognitive beliefs. Recent research also shows that metacognitive beliefs play a role in procrastination (Fernie & Spada, 2008). Metacognitive beliefs refer to the information individuals hold about their own cognition and internal states, as well as the coping strategies they activate in problematic situations (Wells, 2000; Wells & Matthews, 1994, 1996). From a metacognitive standpoint, procrastinators are thought to delay or postpone action primarily because they doubt their own ability to complete a task, and they fear possible negative consequences of failing to adequately complete a task (Shoham-Saloman, Avner & Neeman, 1989). Current theory has identified positive and negative metacognitive beliefs about procrastination (Fernie & Spada, 2008; Spada, Hiou, & Nikcevic, 2006). Positive metacognitive beliefs concern primarily the usefulness of procrastination in improving cognitive performance. They may include beliefs such as "Procrastination helps creative thinking" or "When I procrastinate, I am unconsciously mulling over difficult decisions." Such beliefs may predispose students to delay task initiation as a form of coping. Negative metacognitive beliefs concern primarily the uncontrollability of procrastination. They may include beliefs such as "Procrastination makes me feel down" or "When I procrastinate, I waste a lot of time thinking about what I am avoiding" (Fernie, Spada, Nikcevic, Georgiou & Moneta, 2009). Such beliefs may perpetuate procrastination through predisposing students to intrusive thoughts and feelings which simultaneously consumes their cognitive resources necessary for concentration and controlling over thinking and coping (Fernie et al., 2009).

Specific positive and negative metacognitive beliefs about procrastination were found in chronic procrastinators in the general population (Spada, Hiou, & Nikcevic, 2006). For instance, Spada, Hiou, and Nikcevic (2006) found that metacognitive beliefs about cognitive confidence ("My memory can mislead me at times") predicted behavioral procrastination, and that positive metacognitive beliefs about worry ("Worry can help me solve problems") predicted decisional procrastination. They postulated that individuals who hold negative beliefs about their cognitive efficiency may doubt their task performance capabilities. The latter are likely to adversely impact motivation as well as task initiation and persistence, leading to behavioral procrastination. Similarly, Fernie et al., (2009) found that positive metacognitive beliefs about procrastination were positively correlated with decisional procrastination. Negative metacognitive beliefs were positively correlated with both decisional and behavioral procrastination in undergraduate students. However, the influence of metacognitive beliefs about procrastination on students' behaviors and motivation has not been studied in graduate students, and no study has directly compared undergraduate and graduate students' metacognitive beliefs about procrastination.

Achievement goal orientation. The final motivational variable the present study examined was achievement goal orientations. Achievement goal orientations represent the different purposes or reasons for students to engage in achievement situations (Ames, 1984; Pintrich, 2000). These purposes direct student cognition and behavior across a range of academic tasks or learning situations, and determine how they approach and engage in learning activities (Ames, 1984). According to Elliot and McGregor's (2001) (2 × 2) achievement goal framework, a mastery-approach goal applies to the students who focus on improving ability, or thoroughly understanding new information. A mastery-avoidance goal applies to the students who strive to avoid failing to learn what there is to learn (Elliot & Harackiewicz, 1996; Pintrich, 2000). A performance-approach goal applies to the students who focus on doing better than their peers, or proving their self-worth to other people (Ames & Archer, 1988; Dweck, 1991; Moller & Elliot, 2006). A performance-avoidance goal applies to the students who strive to avoid demonstrating a lack of competence with a particular topic (McGregor, & Elliot, 2002; Midgley, Kaplan &

Middleton, 2001). Students with performance-avoidance goal orientations are also concerned about how they compare with others. However, these students focus on avoiding the demonstration of their lack of ability, or preventing the perception that they are not competent with a particular topic or skill (McGregor, & Elliot, 2002; Midgley et al., 2001).

In addition, work-avoidance goal orientation was included in the present study (Elliot, 1999; Maehr, 1983; Nicholls, Patashnick, & Nolen, 1985). Work-avoidance goal orientation applies to students who strive to minimize their effort for academic tasks, prefer the tasks that can be completed quickly and easily, or prefer not to work too hard. Students with work-avoidance goals tend to exhibit maladaptive motivation, cognitive and metacognitive strategies, and poor academic outcomes (Howell & Watson, 2007; Meece & Holt, 1993; Middleton & Midgley, 1997; Wolters, 2003). Work-avoidance goal was included in the present study because it provided an index to detect students' motivational beliefs and behavior patterns of trying to get away with putting as little effort as possible into academic tasks (Wolters, 2003).

Current research of achievement goal orientations supports the view that procrastination is one specific self-handicapping behavior (Ferrari, 1992, 1994; Ferrari & Tice, 2000; Ommundsen, 2001; Rhodewalt, 1994; Wolters, 2004). For instance, the mastery-approach goal was found to be related positively to higher levels of self-efficacy and help-seeking strategies (Pintrich, 2000; Schraw et al., 2007), but negatively to self-handicapping (Midgley, Arunkamar, & Urdan, 1996; Pintrich, 2000) and procrastination in undergraduate students (Howell & Watson, 2007; Wolters, 2003, 2004). Similarly, Midgley and Urdan (1995) found that self-handicapping was predicted negatively by a mastery goal orientation, but positively by performance-avoidance orientation. Other research shows that students may procrastinate more and have higher test anxiety under conditions that foster a mastery-avoidance orientation (Elliot & McGregor, 2001; Howell & Buro, 2009; Howell & Watson, 2007), a performance-avoidance orientation (McGregor & Elliot, 2002), or work-avoidance orientation (Blunt & Pychyl, 1998; Clark & Hill, 1994; Ferrari, 1991; Ferrari & Tice, 2000; Wolters, 2003).

Contrary to the popular view of procrastination as a dysfunctional self-handicapping behavior, Chu and Choi (2005) argued that active procrastination is a self-regulatory behavior that some procrastinators intentionally engage in for adaptive values and positive outcomes. They described active procrastinators as possessing desirable characteristics similar to non-procrastinators who maintain positive motivation toward the tasks and intend to learn and perform well in class. Nevertheless, Chu and Choi (2005) did not include achievement goal orientations in their study, and no research has examined the difference of achievement goal orientations between undergraduate and graduate students. To address this gap, the present study adopted a more comprehensive framework (i.e., Elliot & McGregor's (2 x 2) model, plus work-avoidance goal orientations, Maehr, 1983) to examine how achievement goal orientations relate to different types of procrastination (Chu & Choi, 2005) in undergraduate and graduate students.

The Present Study

Recently, research on procrastination started to examine academic procrastination from the self-regulated learning perspective (Schraw et al., 2007; Senécal et al., 1995; Wolters, 2003, 2004). This research distinguished different procrastination types and examined motivation factors associated with passive and active procrastination (e.g., Chu & Choi, 2005; Schraw et al., 2007). However, the existing research was limited mostly to a single educational level. The present study contributed to the literature by using a cross-sectional design to compare undergraduate

and graduate students' procrastination types and the associated motivation variables in one subject-matter area. Controlling the subject-matter area allowed the present study to exclude the influence of different subject-matter disciplines on students' motivation and behaviors related to procrastination, and therefore would enhance validity of the study. Based on the self-regulated learning perspective, self-efficacy, metacognitive beliefs, and achievement goals were examined in the present study, because these motivational variables were expected to be predictors of procrastination. More importantly, because they are malleable student characteristics, future interventions can be designed to work on these variables (Banudra, 1997; Pintrich, 2000; Rakes & Dunn, 2010; Wolters, 2003). For instance, if self-efficacy, metacognitive beliefs, and achievement goal are found to be predictive of procrastination, courses can be designed to take pre-emptive action against academic procrastination by promoting student academic confidence, increasing guidance for self-regulation, and facilitating learning goal orientation.

Understanding how different types of academic procrastination relate to these motivational factors in undergraduate and graduate students would allow faculty and staff to make concerted efforts to more effectively tackle this prevalent problem. Specifically, the present study addressed three research questions: (1) How procrastination types were associated with motivation for undergraduate and graduate students? (2) Which motivational factors predicted different types of procrastination for undergraduate and graduate students? (3) What were the differences in motivation among the different types of procrastinators between undergraduate and graduate students?

II. Method.

A. Participants.

Participants of the study included sixty-six undergraduate students and sixty-eight graduate students enrolled in two educational psychology classes in the College of Education at a four-year university in the southeastern U.S. The same instructor taught both classes for undergraduate and graduate students, thereby minimizing the threat to internal validity due to instructor differences. Standard Institutional Review Board procedures were followed to ensure the privacy and anonymity of the participants. Of the 66 undergraduate students, 82% (54) were female and 18% (12) male. Forty-three (80%) participants identified themselves as Caucasian/White, ten (15%) as Black, and three (5%) as other. They majored in early childhood (55%), middle grades (24%), secondary (4%), special education (7%), and other majors (10%). Their age ranged from 20 to 59 (M=27.21, SD=9.28), suggesting that the sample included a considerable number of nontraditional students.

Of the 68 graduate students, 84% (57) were female and 16% (11) male. Forty-three (64%) identified themselves as White, eighteen (27%) as Black, and five (9%) as Hispanic and other. They majored in counseling (65%) and other education majors (35%; e.g., early childhood, art education, social studies, etc.). They ranged in age from 22 to 56 (M=32.12, SD=9.04). Inclusion of older non-traditional students was expected in the graduate sample.

B. Measurement and Procedure.

Participants were invited to respond to a survey packet during the last class. The packet included the following measurement instruments. An *Educational Psychology Self-Efficacy* inventory

consisting of eight items answered on a 5-point Likert scale. Participants were asked to indicate their level of agreement on each statement ranging from 1 (nothing like me) to 5 (a great deal like me). This self-developed questionnaire followed Bandura's (1986, 1997) guideline of self-efficacy scales and has been shown to be internally reliable in previous studies (e.g., Nietfeld, Cao, & Osborne, 2006). Sample items included "I am sure that I can learn educational psychology" (Cronbach α=.79 for the total; .92 for the graduate, and .68 for the undergraduate, hence after).

Metacognitive beliefs about Procrastination Questionnaire (Fernie et al., 2009) consisted of two-factors of eight items each measuring metacognitive beliefs about procrastination. The first factor (Cronbach α=.81;.74/.86) represented positive metacognitive beliefs about procrastination (e.g., Procrastination allows creativity to occur more naturally), while the second factor (Cronbach α=.80;.78/.82) represented negative beliefs about procrastination (e.g., Procrastination increases my worry). Participants were asked to express their level of agreement with the statement on a Likert scale ranging from 1 (not at all true) to 7 (very true).

Achievement Goal Orientations Questionnaire consisted of 16 items on a 7-point Likert scale (Cronbach alpha=.79;.79/.77). For each item, the participants read a short statement and then chose a number from 1 to 7 to indicate how strongly they agree (7) or disagree (1) with the statement. The questionnaire included 12 items (Elliot & McGregor, 2001) that measured the mastery- and performance-approach vs. mastery- and performance-avoidance goal orientations, plus four items measuring the work-avoidance goal orientation (Wolters, 2003). A sample item of mastery-approach goal orientation read, "I want to learn as much as possible from this class." A sample mastery-avoidance goal orientation item included, "I worry that I may not learn all that I possibly could in this class." A sample performance-approach goal orientation item is, "My goal in this class is to get a better grade than most of the other students." A sample performance-avoidance goal orientation item included, "I just want to avoid doing poorly in this class." A sample work-avoidance goal orientation item read, "I like the class work best that I can finish quickly."

Academic Procrastination. Tuckman's (1991) 16-item Procrastination Scale (Cronbach α=.87;.90/.83) was used to measure "the tendency to waste time, delay, and intentionally put off something that should be done" (p. 479). Participants were asked to indicate agreement on a Likert scale ranging from 1 (not at all true to me) to 7 (very true to me) on a statement (e.g., "I needlessly delay finishing jobs, even when they're important.") of passive procrastination.

Active Procrastination. Choi and Moran's (2009) 16-item scale was used to identify active procrastinators (Cronbach α=.83;.73/.86). This 7-point Likert scale measures four defining characteristics of active procrastinators: (a) preference for pressure (e.g., "I tend to work better under pressure"), (b) intentional procrastination (e.g., "I intentionally put off work to maximize my motivation"), (c) ability to meet deadlines (e.g., "Since I often start working on things at the last moment, I have trouble finishing assigned tasks most of the time" [reverse coded]), and (d) outcome satisfaction (e.g., "I feel that putting work off until the last minute does not do me any good" [reverse coded]). A composite score of these four subscales was used to assess the overall tendency toward active procrastination.

III. Results.

Pearson correlation procedures were used to address the first research question: *How procrastination types were associated with motivation for undergraduate and graduate students?*

No significant correlation was found between academic procrastination and active procrastination either for undergraduate or graduate students, suggesting that the Academic Procrastination Scale and the Active Procrastination Scale measured different constructs.

As Table 1 shows, for undergraduate students, academic procrastination is positively correlated with positive metacognitive beliefs about procrastination ($r=.56$, $p<0.001$), performance-avoidance goal orientation ($r=.29$, $p<0.019$), and work-avoidance goal orientation ($r=.35$, $p<0.004$); but negatively correlated with test performance ($r=-.26$, $p<0.038$) and age ($r=-.25$, $p<0.044$). Active procrastination is positively correlated with positive metacognitive beliefs about procrastination ($r=.29$, $p<0.019$); but negatively correlated with negative metacognitive beliefs about procrastination ($r=-.51$, $p<0.001$) and mastery-approach goal orientation ($r=-.34$, $p<0.005$).

Undergraduate students' educational psychology self-efficacy beliefs are positively correlated with test performance ($r=.46$, $p<0.001$) and mastery-approach goal orientation ($r=.31$, $p<0.012$); but negatively correlated with mastery-avoidance goal orientation ($r=-.42$, $p<0.001$), performance-avoidance goal ($r=-.27$, $p<0.027$), and work-avoidance goal ($r=-.25$, $p<0.044$). Their positive metacognitive beliefs about procrastination are positively correlated with performance-avoidance ($r=.33$, $p<0.006$) and work-avoidance goal orientation ($r=.41$, $p<0.001$); but negatively correlated with test performance ($r=-.36$, $p<0.003$), age ($r=-.37$, $p<0.003$), and mastery-approach goal orientation ($r=-.39$, $p<0.001$).

For graduate students, academic procrastination is positively correlated with positive metacognitive beliefs about procrastination ($r=.72$, $p<0.001$), performance-avoidance goal orientation ($r=.39$, $p<0.001$), and work-avoidance goal orientation ($r=.52$, $p<0.001$); but negatively correlated with mastery-approach goal orientation ($r=-.32$, $p<0.008$). Active procrastination is positively correlated with educational psychology self-efficacy ($r=.37$, $p<0.002$). Their positive metacognitive beliefs about procrastination are positively correlated with mastery-avoidance goal orientation ($r=.27$, $p<0.028$), performance-avoidance ($r=.42$, $p<0.001$), and work-avoidance goal orientation ($r=.49$, $p<0.001$); but negatively correlated with age ($r=-.35$, $p<0.004$) and mastery-approach goal orientation ($r=-.25$, $p<0.042$). Their negative metacognitive beliefs about procrastination are positively correlated with mastery-approach goal orientation ($r=.27$, $p<0.024$).

A three-step hierarchical regression analysis was used to address the second question: *Which motivational factors predicted different types of procrastination for undergraduate and graduate students?* The hierarchical approach was selected over a forced entry or stepwise method, because this approach allowed selection of predictors for the theoretical reasons to examine the added influence of different motivational variables on procrastination (Field, 2009). Before the regression analysis was conducted, normality of the dataset was examined using methods described by Tabachnick and Fidell (2001). Specifically, the skewness and Kurtosis scores of the dependent variables of the regression models [i.e., the total scores of the Academic Procrastination Scale (Tuckman, 1991) and the Active Procrastination Scale (Choi & Moran, 2009)] were examined for both undergraduate and graduate students. None of the skewness and the Kurtosis scores exceed 2.5 times of their corresponding standard errors (Morgan, Leech, Gloechner, & Barrett, 2011), suggesting the dataset normality was not violated.

As Table 2 shows, positive metacognitive beliefs about procrastination were the sole predictor of academic procrastination for both undergraduate students in step one ($\beta=.56$, $t_{(63)}=5.19$, $p<.001$), step two ($\beta=.54$, $t_{(62)}=4.92$, $p<.001$), and step three ($\beta=.50$, $t_{(57)}=3.75$, $p<.001$); and graduate students in step one ($\beta=.73$, $t_{(65)}=8.16$, $p<.001$), step two ($\beta=.72$,

$t_{(64)}=8.03$, $p<.001$), and step three ($\beta=.60$, $t_{(59)}=5.53$, $p<.001$). The model explained 32% of the variance in academic procrastination score for undergraduate students and 51% for graduate students. In addition, Table 2 shows that for undergraduate students active procrastination was predicted by negative metacognitive beliefs about procrastination in step one ($\beta=-.47$, $t_{(63)}=-4.25$, $p<.005$), step two ($\beta=-.47$, $t_{(62)}=-4.26$, $p<.001$), and step three ($\beta=-.45$, $t_{(57)}=-3.89$, $p<.001$), plus mastery-approach goal orientations in step three ($\beta=-.32$, $t_{(57)}=-.2.31$, $p<.025$). For graduate students, active procrastination was predicted by positive metacognitive beliefs about procrastination ($\beta=.26$, $t_{(64)}=2.30$, $p<.025$) and educational psychology self-efficacy ($\beta=.39$, $t_{(64)}=3.48$, $p<.001$) in step two; but only by educational psychology self-efficacy ($\beta=.36$, $t_{(59)}=3.16$, $p<.002$) in step three. The model explained 29% of the variance in active procrastination score for undergraduate students and 6% for graduate students.

In order to address the third research question about the differences in motivation among different types of procrastinators between undergraduate and graduate students, a two-step process (Chu & Choi, 2005) was used to categorize the participants into three subgroups for undergraduate and graduate students. In the first step, participants' responses on Tuckman's (1991) Academic Procrastination Scale were used to distinguish procrastinators from non-procrastinators among undergraduate students. The undergraduate participants who scored less than the median score (3.00) on the Tuckman Scale were grouped as non-procrastinators and those who scored equal or greater than 3.00 were grouped as procrastinators. Among the 66 undergraduate participants, 30 were categorized as non-procrastinators and 36 were categorized as procrastinators. In the second step, participants' responses on Choi and Moran's (2009) Active Procrastination Scale were used to distinguish passive procrastinators from active procrastinators. Among the 36 undergraduate procrastinators, those who scored less than the median score (3.75) on the Active Procrastination Scale were grouped as passive procrastinators ($n=16$) and those who scored equal or greater than 3.75 were grouped as active procrastinators ($n=20$). The same procedure was used to distinguish the procrastinator groups for the graduate students. Among the 68 graduate students, 33 were identified as non-procrastinators, 15 as passive procrastinators, and 20 as active procrastinators.

Analyses of covariate (ANCOVA) procedures were used to examine differences of the major variables among non-procrastinators, passive procrastinators, and active procrastinators separately for undergraduate and graduate students. Because the undergraduate group included nontraditional students ($M=27.21$, $SD=9.28$) and a significant age difference was found among the three procrastination groups ($F_{(2,62)}=9.08$, $p=.004$; $\eta^2=.13$), student age was used as a covariate to control the age effect on procrastination and motivation for the undergraduate group. For the undergraduate students, the ANCOVA results revealed a significant omnibus effect among the three procrastination groups on metacognitive beliefs, educational psychology self-efficacy, achievement goals, and test performance (Wilk's $\lambda=.54$, $F_{(2,62)}=2.15$, $p=.008$, $\eta^2=.26$). As Table 3 shows, a significant difference was found among the three procrastination groups in positive metacognitive beliefs about procrastination ($F_{(2,62)}=9.18$, $p=.001$; $\eta^2=.23$); negative metacognitive beliefs about procrastination ($F_{(2,62)}=5,64$, $p=.006$; $\eta^2=.15$); mastery-avoidance goal orientation ($F_{(2,62)}=3.50$, $p=.036$; $\eta^2=.10$); and work-avoidance goal orientation ($F_{(2,62)}=4.19$, $p=.020$; $\eta^2=.12$).

The Bonferroni procedures were used to further examine differences among the three groups. The pair-wise comparisons show that both active procrastinators (Group 3, $M=4.02$, $p=.001$) and passive procrastinators (Group 3, $M=3.43$, $p=.040$) reported a significantly higher level of positive metacognitive beliefs about procrastination than the non-procrastinators (Group

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Table 1. Correlations among the major variables among undergraduate and graduate Students.

		1	2	3	4	5	6	7	8	9	10	11	12
1	Test Performance	--	.33**	-.26*	.06	.46**	-.36**	.10	.17	-.14	.04	-.34**	-.17
2	Age	.24	--	-.25*	-.13	.06	-.37**	-.03	.24	-.15	-.22	-.37**	-.09
3	Academic Procrastination	-.16	-.17	--	.19	-.19	.56**	-.16	-.16	.08	.08	.29*	.35**
4	Active Procrastination	-.13	-.02	.14	--	.02	.29*	-.51**	-.34**	-.20	.08	-.04	.11
5	Ed. Psychology Self-Efficacy	.02	.11	-.16	.37**	--	-.22	.08	.31*	-.42**	.20	-.27*	-.25*
6	Positive Beliefs About Procrastination	-.18	-.35**	.72**	.24	-.08	--	-.24	-.39**	.09	.12	.33**	.41**
7	Negative Beliefs About Procrastination	.15	.24	-.13	-.10	-.07	-.23	--	.15	.21	-.07	.14	.00
8	Mastery Approach	.12	.34**	-.32**	.11	.14	-.25*	.27*	--	.19	.27*	-.04	-.22
9	Mastery Avoidance	-.33**	-.08	.17	.15	-.03	.27*	-.02	.19	--	-.00	.39**	.17
10	Performance Approach	.14	-.24	.24	.22	-.00	.20	-.13	-.16	.03	--	.19	.28*
11	Performance Avoidance	-.16	-.29*	.39**	.08	-.13	.42**	-.17	-.20	.17	.23	--	.33**
12	Work Avoidance	-.09	-.29*	.52**	.21	-.06	.49**	-.17	-.52**	.00	.49**	.42**	--

Note: ** =significant at 0.01 level; * =significant at the 0.05 level (2-tailed). Correlational coefficients above the diagonal line represent undergraduate students (n=66) and those below the diagonal line represent graduate students (n=68).

Table 2. Summary of hierarchical regression analyses predicting academic and active procrastination.

Model	Academic Procrastination						Active Procrastination					
	B		Std. Error		β		B		Std. Error		β	
	Undrg	Grad	Undrg	Grad	Undrg	Grad	Undrg	Grad	Undrg	Grad	Undrg	Grad
Step 1												
Positive Metacog. Beliefs about Procrast.	.62	.60	.12	.07	.56**	.73**	.14	.21	.08	.12	.18	.22
Negative Metacog. Beliefs about Procrast.	-.02	.03	.11	.07	-.02	.04	-.33	-.05	.08	.12	-.47**	-.05
Step 2												
Positive Metacog. Beliefs about Procrasti.	.60	.59	.12	.07	.54**	.72**	.15	.25	.09	.11	.20	.26*
Negative Metacog. Beliefs about Procrast.	-.02	.03	.11	.07	-.02	.03	-.33	-.01	.08	.11	-.47**	-.01
Educational Psychology Self-Efficacy	-.10	-.19	.16	.16	-.07	-.10	.11	.82	.11	.24	.10	.39**
Step 3												
Positive Metacog. Beliefs about Procrasti.	.56	.49	.15	.09	.50**	.60**	.06	.17	.10	.13	.07	.18
Negative Metacog. Beliefs about Procrasti.	-.06	.06	.12	.08	-.06	.07	-.32	-.05	.08	.11	-.45**	-.05
Educational Psychology Self-Efficacy	-.08	-.15	.20	.16	-.06	-.08	.17	.76	.14	.24	.17	.36**
Mastery-Approach	.12	-.08	.12	.09	.13	-.09	-.19	.23	.08	.14	-.32*	.23
Mastery-Avoidance	-.04	.01	.10	.06	-.06	.02	.01	.05	.07	.08	.01	.07
Performance-Approach	-.05	.01	.09	.05	-.07	.02	.04	.08	.06	.08	.09	.12
Performance-Avoidance	.08	.03	.10	.05	.11	.05	.0	-.02	.07	.08	.01	-.04
Work-Avoidance	.14	.12	.12	.10	.16	.16	.01	.19	.08	.15	.02	.21

Note: ** $p<.001$; * $p<.05$. Left column for undergraduate students (n=66): for Academic Procrastination, $\Delta R^2=.32$ ($p<.001$) for Step 1; $\Delta R^2=.00$ ($p<.001$) for Step 2; $\Delta R^2=.03$ ($p<.001$) for Step 3. For Active Procrastination, $\Delta R^2=.29$ ($p<.001$) for Step 1; $\Delta R^2=.01$ ($p<.001$) for Step 2. $\Delta R^2=.07$ ($p<.001$) for Step 3. Right column for graduate students (n=68): for Academic Procrastination, $\Delta R^2=.51$ ($p<.001$) for Step 1; $\Delta R^2=.01$ ($p<.001$) for Step 2; $\Delta R^2=.05$ ($p<.001$) for Step 3. For Active Procrastination, $\Delta R^2=.06$ ($p=.15$) for Step 1; $\Delta R^2=.15$ ($p<.002$) for Step 2; $\Delta R^2=.08$ ($p<.008$) for Step 3.

Table 3. *Mean, SD, and ANCOVA results of test performance, metacognitive beliefs about procrastination, self-efficacy, and achievement goal orientations of non-procrastinators, passive procrastinators, and active procrastinator with age as covariate.*

	Group 1 (n=30)	Group 2 (n=16)	Group 3 (n=20)	Total (n=66)			
Undergraduate Student	(n=30)	(n=16)	(n=20)	(n=66)			
Graduate Student	(n=33)	(n=15)	(n=20)	(n=68)	F	p	η^2
Age	28.07(10.69)	29.56 (11.69)	23.10(4.48)	27.21(9.28)	9.08	.00**	.13
	32.73 (9.12)	31.93 (10.56)	31.25 (8.01)	32.12 (9.04)	3.49	.07	.05
Test Scores	86.73 (8.36)	83.00 (8.07)	82.90 (8.55)	84.67 (8.44)	1.39	.26	.04
	88.97 (5.60)	87.33 (8.05)	85.95 (6.46)	87.72 (6.49)	1.23	.30	.04
Positive Metacognitive Beliefs about Procrastination	2.78 (.83)	3.43 (.90)	4.02 (.98)	3.31 (1.03)	9.18	.00**	.23
	2.33 (.815)	3.63 (1.33)	3.78 (.87)	3.04 (1.18)	18.87	.00**	.37
Negative Metacognitive Beliefs about Procrastination	4.72 (1.03)	5.02 (.69)	3.95 (1.24)	4.56 (1.10)	5.64	.00**	.15
	4.62 (1.16)	4.40 (1.38)	4.53 (1.20)	4.54 (1.18)	.15	.86	.00
Ed. Psychology Self- Efficacy	3.74 (.69)	3.52 (.72)	3.58 (.91)	3.64 (.76)	.49	.62	.02
	3.87 (.53)	3.61 (.39)	3.66 (.61)	3.75 (.53)	1.59	.21	.05
Mastery-Approach	5.39 (1.11)	5.63 (1.11)	4.63 (1.48)	5.22 (1.28)	2.54	.09	.08
	5.65 (1.02)	4.71 (1.04)	5.33 (1.19)	5.35 (1.12)	4.06	.02*	.11
Mastery-Avoidance	4.67 (1.51)	5.27 (1.33)	4.13 (1.91)	4.65 (1.64)	3.50	.04*	.10
	4.30 (1.64)	4.62 (1.63)	4.95 (1.51)	4.56 (1.60)	.96	.39	.03
Performance-Approach	3.39 (1.58)	3.48 (1.73)	3.93 (1.60)	3.58 (1.61)	.38	.69	.01
	2.73 (1.75)	2.93 (1.87)	3.70 (1.77)	3.06 (1.81)	1.72	.19	.05
Performance-Avoidance	4.66 (1.69)	5.40 (1.21)	5.12 (1.33)	4.97 (1.49)	1.71	.19	.05
	3.88 (1.77)	5.00 (1.52)	5.32 (1.78)	4.55 (1.82)	4.83	.01*	.13
Work-Avoidance	3.53 (1.25)	4.06 (.72)	4.60 (1.47)	3.98 (1.28)	4.19	.02*	.12
	2.63 (1.13)	3.47 (1.09)	3.94 (1.18)	3.20 (1.26)	8.68	.00**	.21

Note: *=$p<.05$, **=$p<.001$. df=(2, 62) for undergraduate students and df=(2, 64) for graduate students. Group 1=Non-Procrastinators; Group 2=Passive Procrastinators; Group 3=Active Procrastinators. Age was used as covariate in the ANCOVA, but reported here for group comparison.

1, *M*=2.78). However, active procrastinators (Group 3, *M*=3.95) reported a significantly lower level of negative metacognitive beliefs about procrastination than passive procrastinators (Group 2, *M*=5.02, *p* =.007) and the non-procrastinators (Group 1, *M*=4.72, *p* =.028). Furthermore, a significant difference was also found in the mastery-avoidance goal orientation between passive procrastinators (Group 2, *M*=5.27) and active procrastinators (Group 3, *M*=4.13, *p* =.032); and in the work-avoidance goal orientation between non-procrastinators (Group 1, *M*=3.53) and active procrastinators (Group 3, *M*=4.60, *p* =.017). No significant difference in test performance was found among the three procrastinator groups in the undergraduate students.

For the graduate students, the ANOVA results revealed a significant omnibus effect among the three procrastination groups on metacognitive beliefs, self-efficacy, achievement goals, and test performance (Wilk's λ=.46, $F_{(2,62)}$=3.00, *p*=.001, η^2=.33). As Table 3 shows, a significant difference was found among the three procrastination groups in positive metacognitive beliefs about procrastination ($F_{(2,64)}$=18.87, *p*=.001; η^2=.37); mastery-approach goal orientation ($F_{(2,64)}$=4.06, *p*=.022; η^2=.11); performance-avoidance goal orientation ($F_{(2,64)}$=4.83, *p*=.011; η^2=.13); and work-avoidance goal orientation ($F_{(2,64)}$=8.68, *p*=.001; η^2=.21).

Again, the Bonferroni analyses show that both active procrastinators (Group 3, *M*=3.78, *p* =.001) and passive procrastinators (Group 2, *M*=3.63, *p* =.001) reported a significantly higher level of positive metacognitive beliefs about procrastination than the non-procrastinators (Group 1, *M*=2.33). In addition, the non-procrastinators (Group 1, *M*=5.65) reported a significantly higher level of the mastery-approach goal orientation than passive procrastinators (Group 2, *M*=4.71, *p* =.018). However, the non-procrastinators reported a significantly lower level of the performance-avoidance goal orientation (Group 1, *M*=3.88, *p* =.016) and work-avoidance goal orientation (Group 1, *M*=2.63, *p* =.001) than active procrastinators (Group 3, *M*=5.32, *M*=3.94, respectively). No significant difference in test performance was found among the three procrastinator groups in the graduate students.

IV. Discussion and Conclusion.

The present study used a self-regulated learning perspective to compare undergraduate and graduate students' procrastination types and associated motivation. The purpose was to better understand similarities and differences of procrastination behaviors and associated motivation in undergraduate and graduate students. The results contribute to research on procrastination and self-regulated learning and inform interventions addressing procrastination.

Results to the first research question on the relationships between procrastination types and motivation revealed three points of similarity of undergraduate and graduate students. The first similarity concerns the tendency and reason of procrastination. The results show that *academic procrastination* was more likely to occur in those who had stronger beliefs that procrastination was beneficial and would improve cognitive performance in both undergraduate and graduate students. The second similarity relates to the strength of the correlation between academic procrastination and students' positive beliefs about procrastination. For both undergraduate and graduate students, the correlation between positive metacognitive beliefs about procrastination and academic procrastination was the strongest among all the relations. Together, these findings suggest that students' positive metacognitive beliefs about the adaptive values of procrastination play a more important role in propagating academic procrastination than other motivation variables, such as self-efficacy and achievement goal orientations.

The third similarity points to the purpose of procrastination. The results show that procrastinators in undergraduate and graduate students had a higher tendency to avoid performing worse than their peers and to minimize their efforts for academic tasks (Blunt & Pychyl, 1998; Clark & Hill, 1994; Ferrari, 1991; Ferrari & Tice, 2000; Wolters, 2003). These findings demonstrate efficacy of the self-regulated learning perspective in the study of procrastination, and show that procrastination is a motivational problem that involves more than poor time management skills or trait laziness (Özer, 2011; Senécal et al., 1995). More importantly, these findings suggest that motivational and cognitive factors must be considered together to understand academic procrastination (Howell & Buro, 2009; Muszynski & Akamatsu, 1991; Steel, 2007). In particular, metacognitive beliefs about procrastination, performance-avoidance goal, and work-avoidance goal need to be addressed to help both undergraduate and graduate students battle against academic procrastination.

Also, interesting differences were found on the negative correlates with academic procrastination between undergraduate and graduate students. First, the results show that age was negatively related to academic procrastination for undergraduate students, but not for graduate students. This finding suggests that younger undergraduate students were more likely to procrastinate than their older counterparts who were mostly nontraditional students. This finding is consistent with the previous research that procrastination tendency reaches a peak for persons in their middle-to-late 20s and declines until approximately age 60 (Ferrari, Johnson, & McGown, 1995). This finding also implies the possibility that students may grow out of the procrastination problem as they become more experienced in school and more mature in life. Consequently, procrastination can be approached as a developmental problem in undergraduate students, as well as a flaw in personality trait (Özer, Demir, & Ferrari, 2009; Jiao et al., 2011; Schouwenbury, 2004; Steel, 2007).

Second, a negative correlation was found between academic procrastination and mastery-approach goal orientation in the graduate students, but not in undergraduate students. It was a little surprising that no significant relation was found between academic procrastination and mastery-approach goal orientation in undergraduate students. However, the negative correlation found between academic procrastination and mastery-approach goal orientation in graduate students was expected. This finding suggests that procrastination was less likely to occur for the graduate students who seek to improve their knowledge and learn all there is to learn. The inverse relationship between academic procrastination and the mastery-approach goal is consistent with the previous research that a negative correlation exists between academic procrastination and a general mastery orientation (Schraw et al., 2007). As the previous results show, students who procrastinated were less likely to adopt the learning goal and make the effort to learn everything there is to learn (Howell & Buro, 2009; Wolters, 2003), but more likely to adopt avoidance goal orientations (Howell & Watson, 2007).

The present data presented mixed results regarding the relationships between test performance and procrastination. On the one hand, the present result supported the previous finding that undergraduate students who reported high on procrastination score achieved lower on test performance (Brinthaupt & Shin, 2001; Jiao et al., 2011; Tice & Baumeister, 1997; Wang & Englander, 2010). These results demonstrated that procrastination has a negative effect on test performance. On the other hand, the present data show that there is no significant difference among the three different procrastination groups in both undergraduate and graduate participants, despite their differences in the motional variables, e.g., metacognitive beliefs about procrastination and achievement goals discussed above. These results were consistent with the

previous findings that procrastination scores were positively related to academic behavior delays but unrelated to exam scores (Ferrari, 1992; Solomon & Rothblum, 1984). These mixed results suggest that a complex relationship between procrastination and academic performance.

One possible explanation of the lack of influence of procrastination on test performance was the small sample size in each procrastination group in the present study, even though each group satisfied the minimum requirement (Table 3) for the parametrical data analysis procedure such as ANOVA and regression. Another possible reason might be that the deleterious consequences of procrastination on performance are cumulative (Ferrari et al., 1995) which might be better captured by measures of academic performance over time such as grade point average (GPA). The discrepancy noted between the present results and previous research does indicate that further research is necessary to understand at what point procrastination begins to affect performance (Pychyl, Morin, & Salmon, 2000).

Similarly, differences were found in the correlations between *active procrastination* and motivation factors in undergraduate students and graduate students. For the undergraduate students, active procrastinators tended to be those who believed more in the usefulness of procrastination, had less concerns about uncontrollability of procrastination, and possessed lower mastery-approach goals. In contrast, for the graduate students, active procrastination tended to be those who were more confident about their ability to learn the class content. The correlates of active procrastination mostly concurred with the motivational factors identified in the existing research such as metacognitive beliefs and achievement goal orientations for undergraduate students (Howell & Buro, 2009; Özer, 2011; Schraw et al., 2007; Steel, 2007; Wolters, 2003). However, the association of active procrastination with self-efficacy suggests student beliefs of their ability to learn the class content was a unique motive for graduate students to engage in active procrastination.

The positive correlation between student self-efficacy and active procrastination found in the present study is consistent with Chu and Choi's (2005) observation. This result was also confirmed by the regression analysis showing self-efficacy as the sole predictor of active procrastination. These results suggest that graduate students tended to procrastinate when they felt more confident with their abilities to accomplish academic tasks. According to Chu and Choi (2005), this is because active procrastinators were confident in their abilities to meet deadlines and complete the tasks under time pressure, so they intentionally postponed academic tasks and directed their attention toward more urgent issues at hand. However, these results are inconsistent with prior observations that students who were confident about their abilities to do well tended to start their academic work in a more timely manner (Bandura, 1986; Steel, 2007; Wolters, 2003). These conflicting results suggest that observations in the existing research are far from conclusive in regards to the relationships between self-efficacy and procrastination. Nevertheless, the present results show that different motivational factors need to be considered to understand active procrastination in undergraduate and graduate students.

In addition to the procrastination types, the present study examined associated motivational variables. Again, mixed results were found on students' positive metacognitive beliefs about procrastination. First, similarities were found in the undergraduate and graduate students who believed more about the usefulness of procrastination. These students reported a higher tendency to engage in academic procrastination. They tended to be younger in age within their group. They also tended to adopt lower mastery-approach goals but higher performance-avoidance goals and work-avoidance goals. At the same time, differences were found between undergraduate and graduate students regarding beliefs about the usefulness of procrastination.

For the undergraduate students, those who held a stronger belief that procrastination was beneficial tended to have a higher active procrastination and lower performance on tests. For the graduate students, those who reported a stronger belief about the usefulness of procrastination tended to have a higher level of master-avoidance goal orientations. These students tended to try everything they can to avoid failure to learn all the materials, which may explain the reasons why procrastination occur to these students (Brownlow & Reasinger, 2000; Jiao et al., 2011; Onwuegbuzie, 2000). These results demonstrate that students' positive metacognitive beliefs about procrastination were associated with maladaptive motivational and cognitive factors. Reducing the positive metacognitive beliefs about procrastination would help both undergraduate and graduate students deal with procrastination.

Similarly, differences were found regarding negative metacognitive beliefs about procrastination between undergraduate and graduate students. Among undergraduate students, those who were more concerned about the uncontrollability of procrastination were less likely to engage in active procrastination. In contrast, among the graduate students, those who were more concerned about the uncontrollability of procrastination tended to adopt a stronger master-approach goal orientation. These findings suggest that reinforcing the negative metacognitive beliefs may help undergraduate students to reduce active procrastination and graduate students to adopt the mastery-approach goal which is most desirable to promote learning (Elliot & McGregor, 2001; Fernie & Spada, 2008; Howell & Watson, 2007; Wolters, 2003).

Results to the second research question largely confirmed the findings of the first research question. Positive metacognitive beliefs about procrastination were the sole predictor of academic procrastination for both undergraduate and graduate students, even when self-efficacy and achievement goal orientations were considered. These findings suggest that metacognitive beliefs play a more important role in academic procrastination than self-efficacy and academic achievement goal orientations in undergraduate and graduate students. Therefore, an attempt to help students overcome academic procrastination may be more effective by focusing on students' beliefs of the usefulness of their procrastination.

Similar to the correlation results above, the regression results on active procrastination varied between undergraduate and graduate students. The results show that undergraduate students tended to engage in active procrastination when they were less concerned about the uncontrollability of procrastination and less oriented toward learning in class. These findings are inconsistent with Chu and Choi's (2005) characterization of active procrastination. Chu and Choi (2005; Choi & Moran, 2009) posited that active procrastinators intentionally delayed academic tasks because they preferred time pressure, and they possess the confidence and ability to meet deadlines. However, the function of master-approach goal orientation as a negative predictor of active procrastination clearly shows that active procrastination is associated with maladaptive motivation value, and that the purpose of students engaging in active procrastination is not to learn and develop their competences. Apparently, more research is needed to examine the notion of active procrastination and address the question: Is active procrastination associated with desirable cognitive and motivational characteristics in undergraduate students?

The regression results on active procrastination show that educational psychology self-efficacy is a significant positive predictor to active procrastination in graduate students. This finding is consistent with Chu and Choi's (2005) observation of the positive correlation between self-efficacy and active procrastination. It suggests that students may intentionally delay academic tasks when they have strong beliefs about their abilities to learn the class materials. This finding demonstrates that active procrastination is associated with self-efficacy, which is

often viewed as a desirable motivation variable (Bandura, 1986) in graduate students. Evidently, more research is needed to sort out procrastination among the high self-efficacy graduate students. One way to achieve this purpose is to conduct multivariate studies of procrastination that include ability and motivation. As Bandura (1997) suggested, students' self-efficacy beliefs have a significant impact on their task initiation, self-regulatory efforts, and academic performance when adequate levels of ability and motivation exist. This position suggests that the relationship of self-efficacy with task initiation, efforts, and academic performance is not straightforward, but mediated by a certain level of ability and motivation.

Again, results to the third research question revealed similarities and differences among the three procrastinator groups in undergraduate and graduate students. The group comparisons show that the passive procrastinators and active procrastinators in undergraduate and graduate students reported a significantly higher level of beliefs about the usefulness of procrastination and work-avoidance goal orientation than non-procrastinators. These results suggest that active procrastinators and passive procrastinators are similar in believing procrastination is useful. However, their intent to engage in procrastination is to get away with putting as little efforts as possible in achievement tasks (Elliot, 1999; Maehr, 1983; Nicholls, Patashnick, & Nolen, 1985). These findings are consistent with previous research (Schraw et al., 2007; Wolters, 2003) that procrastination is an irrational delay, or avoidance, of academic tasks and a failure of self-regulation of the learning process (Senécal et al., 1995; Steel, 2007).

The group comparisons also reveal differences among the three procrastinator groups between undergraduate and graduate students. Among the undergraduate students, the active procrastinators were the youngest in age of the three procrastination groups, and they were significantly younger than the passive procrastinators. These findings suggest that among the undergraduate procrastinators, the younger students tended to engage in active procrastination while the older students tended to engage in passive procrastination. Also, active procrastinators reported the least concerns about the uncontrollability of procrastination among the three procrastinator groups; and their concerns were significantly lower than those of the non-procrastinators and passive procrastinators. Furthermore, active procrastinators reported a significantly lower level of mastery-avoidance goal orientation than passive procrastinators. These findings are consistent with the results to the first and second research question discussed above. They suggest that the reasons undergraduate active procrastinators procrastinate relate to their minimal concern with the negative consequences of procrastination and failure to learn all of the class materials. In addition, these results support Chu and Choi's (2005) differentiation between active and passive procrastinators. In this case, active procrastinators are different from passive procrastinators in negative metacognitive beliefs about procrastination and mastery-avoidance goal orientation. While a lower level of negative metacognitive beliefs about procrastination is consistent with active procrastinators' intentional delay of academic tasks (Chu & Choi, 2005), the influence of master-avoidance goal orientations in active procrastination has not yet been adequately examined (Elliot & McGregor, 2001; Howell & Buro, 2009; Howell & Watson, 2007). Further research in this area will facilitate greater understanding of the nature of procrastination, achievement goal orientation, and self-regulated learning (Pintrich, 2000; Wolters, 2003).

Two differences stood out among the three procrastination groups in graduate students. Non-procrastinators reported a significantly higher level of mastery-approach goal orientations than passive procrastinators, but a significantly lower level of performance-avoidance goal orientations than active procrastinators. While the finding concerning the mastery-approach goal

confirmed the negative correlation of the mastery-approach orientation with self-handicapping (Midgley & Urdan, 1995; Midgley, Arunkamar, & Urdan, 1996; Pintrich, 2000) and procrastination (Howell & Watson, 2007; Wolters, 2003), the finding about the performance-avoidance goal orientation is inconsistent with the research that active procrastination was associated with adaptive values of procrastination (Chu & Choi, 2005). Similar to the results for the undergraduate students, these results also challenged Chu and Choi's (2005) description that active procrastinators are more similar to non-procrastinators than to passive procrastinators, even though active procrastinators procrastinate to the same degree as passive procrastinators. More research is called to look into the inconsistent results between the present study and Chu and Choi's (2005) work in order to better understand the nature of active procrastination. For instance, the future research could use quantitative and qualitative designs to examine adaptive and maladaptive characteristics of active and passive procrastinators in the behavioral, motivational, and affective domains. One way to investigate the nature of active procrastination is to identify the procrastinators who are successful in managing their learning process and achieving superior academic performances; and then examine differences in the beliefs, affects, and behaviors of these successful procrastinators as compared to unsuccessful procrastinators and non-procrastinators.

Future research could also examine to what extent students' ability and motivation would be adequate so that self-efficacy enables them to exercise some control over their thoughts, feelings, and actions. At the same time, this research could also indentify to what extent, and under what conditions, students' ability and motivation would become inadequate so that their self-efficacy leads to underestimation of difficulty of a task while simultaneously overestimating the positive benefits of procrastination (Schraw et al., 2007). This line of research would advance research of procrastination and self-regulated learning. Practically, results of this research would help design interventions to help graduate students avoid overconfidence of their ability and consequently failing to self-regulate their learning (Pintrich, 2000; Senécal et al., 1995; Steel, 2007; Wolters, 2003).

In summary, the findings of the present study extend the research on procrastination by providing a more in-depth look at procrastination types and the associated motivation among undergraduate and graduate students simultaneously in one subject area. The present results suggest that students' beliefs about the usefulness of procrastination play a more important role in propagating academic procrastination than other motivation variables for both undergraduate and graduate students. In contrast, different motivational factors, including metacognitive beliefs, self-efficacy, and achievement goal orientations, were involved in active procrastination for undergraduate and graduate students. In addition, student age was related to procrastination types particularly in undergraduate students. Among the undergraduate procrastinators, the younger students were more likely to be active procrastinators, while the older students tended to be passive procrastinators. These results confirmed the traditional view that procrastination is related to undesirable factors that hinder learning (Day et al., 2000; Ferrari, 2001; Jiao et al., Knaus, 2000; Lay, 1990; Steel, 2007); but also offered mixed support to the notion that active procrastination is associated with adaptive values of procrastination (Chu & Choi, 2005, Choi & Moran, 2009) and motivational factors conductive to learning (Wolters, 2003, 2004). Clearly, more evidence is needed to demonstrate that procrastination is not a result of students' systematic underestimation of the difficulty of the task while simultaneously overestimating the positive benefits of procrastination (Schraw et al., 2007).

The present results demonstrated that the self-regulated leaning perspective was useful in studying a complex phenomenon like procrastination. However, the present results should be interpreted with caution. The present study was limited to a relatively small sample observed in one subject area for a short period of time, and the cross-sectional design precluded causal inferences. Studies with larger samples across different subject areas, and tasks over time will expand the research on procrastination, motivation, and self-regulated learning. In particular, further research is needed to investigate the notion of active procrastination for a better understanding of the nature of procrastination. Also, more studies are needed to examine whether self-efficacy functions as a motivational factor that encourages students to procrastinate, or as a deterrent that discourages them to procrastinate in academic situations. The present study used a self-reported measure of procrastination. Future research might employ observation of actual procrastination behavior as an additional, confirmatory measure of student procrastination. The incorporation of such data would strengthen the results of future investigations of procrastination, motivation, and self-regulatory behaviors.

Despite the above limitations, the present results illustrate the importance of examining the relationships between procrastination, motivation, and self-regulated learning in the research of procrastination. They also suggest implications for educational practice. In particular, interventions designed to curtail academic procrastination among undergraduate students might be more effective if they focus on decreasing students' positive metacognitive beliefs about procrastination, and if they pair the younger students with non-traditional students. The present results also raised questions about the role of procrastination in the college classroom. One such question concerns whether teachers and students should be more accepting of procrastination, or even attempt to promote the "safe" active procrastination (Choi & Moran, 2009). Although the present results are preliminary in nature, they clearly suggest that different variables need to be considered in future research and interventions to reduce procrastination in undergraduate and graduate students.

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The role of teachers at university: What do high achiever students look for?

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Abstract: The perceptions of students about their teachers have interested the academic and scientific community, regarding the improvement of the quality of higher education. This paper presents data obtained from interviews conducted with ten high achiever engineering students and focuses on the characteristics of teachers that are highly valued by the participants. Furthermore, the influence of teachers on the development of the students was explored. The data collected describes a set of aspects from the scientific, pedagogic and emotional domains, which students identified about their teachers. Some reflections and practical implications are also presented with regard to the characteristics and pedagogical needs of high achievers.

Keywords: teaching, engineering, higher education, excellence.

I. Role of teachers: Literature review.

Student perceptions concerning learning and teaching processes deeply affect how they think, feel and behave in the pursuit of their academic activities. These perceptions can have an important impact on student learning (Hu & Kuh, 2002; Ramsden, 1992). Several authors have been focusing their attention on the importance of learning situations such as perceptions of students about their teachers, teaching methods, assessment procedures, as well as curricular content and learning approaches (Biggs, 2000; Entwistle, 1991; Kuh, Kinzie, Buckley, Bridges, & Hayek, 2006; Lawler, Chen, & Venso, 2007; Mooney & Mooney, 2001). In general, the studies in this field provide an understanding that the good teacher is not exclusively bounded by scientific competences. Instead, they include components about the way teachers teach and how they motivate and relate to their students (Korthagen, 2004). From a pedagogical viewpoint, the research emphasizes the need for teachers to explain and communicate and, in particular, to make the course content more understandable for the students (Davies, Arlett, Carpenter, Lamb & Donaghy, 2006; Lawler, Chen & Venso, 2007; Menges & Austin, 2001; Ramsden, 1997).

Another important aspect is the ability of the teacher to encourage students in the learning process by promoting intrinsic motivation, self-regulation of learning and the development of deeper approaches to learning, which imply a critical analysis of new ideas resulting in a more profound, longer and structured retention of the concepts learned (Biggs, 2000; Chickering & Gamson, 1987; Kuh et al., 2006; Lawler et al., 2007; Menges & Austin, 2001; Mooney & Mooney, 2001). Some studies also refer to a socio-affective dimension in teaching, which emphasizes the importance of teachers establishing some closeness through dialogue with students (Chickering & Gamson, 1987; Davies et al., 2006).

The current literature seems to be well developed concerning the most valued characteristics of students regarding their teachers. What is not so clear, are the perceptions of

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high achiever students about the role of their teachers throughout their pathway. There are some general aspects mentioned by the authors in relation to the literature of giftedness that draws attention to the subject; namely, the role of support figures for the promotion and development of talent (Gagné, 2004; Kaufmann, Harrel, Milam, Woolverton & Miller, 1986; Renzulli, 2002). The teachers or mentors are also important figures in the theoretical models, which conceptualize academic excellence with respect to the development of expertise. In this specific domain, the role of teachers or mentors consists of providing instruction about how sequences of simple training tasks can allow students to master more complex tasks, and also to what degree of mastery the simpler tasks have to be acquired for them to serve as building blocks for more complex skills (Ericsson & Lehmann, 1996; Ericsson, 1998).

Talented students in higher education also seem to be more sensitive to the quality of teachers in their specific area and they need more appropriate responses from their teachers in terms of depth of research, up-to-date knowledge, and autonomy in order to construct their own knowledge (Csikszentmihalyi, Rathunde & Whalen, 1996). Some authors have also emphasized the importance of respecting their interests and vocational projects, because the academic involvement of talented students is a result of their intrinsic motivation for learning (Renzulli, Gubbins, Siegle, Zhang, & Chen, 2005).

Several theoretical models recognize that excellence is the product of an interaction between personal and contextual factors (Gagné, 2004; Heller, 2005; Heller & Viek, 2000; Trost, Heller, Mönks, Sternberg, & Subotnik, 2000). However, very little is known about the requirements or optimal conditions for talent development. There are some studies that indicate that an environment of promotional assistance can make a great difference in the achievement of gifted or talented students (Heller & Viek, 2000; Zuckerman, 1992). As it is argued by Heller and Viek (2000), without that knowledge about the specific role of the contextual factors, namely the role of teachers involved in the talent development process, it is difficult to select goal-oriented, individualized, realistic support measures. The implementation of appropriate measures in early stages of talent development can make a great difference on motivation and future achievement (Arnold, 1994; Subotnik & Arnold, 1993). Some longitudinal studies have even demonstrated the relationship between outstanding academic achievement and exceptional success on future career (Lubinski et al., 2006; Lubinski & Benbow, 2006). This aspect reinforces the importance of having a clearer understanding of factors that promote success, since it will also contribute in preparing more motivated and qualified professionals to face and adapt to an increasingly demanding and competitive work world.

The current literature provides some general indicators about important contextual factors to the quality of instruction. However, there are no empirical studies that integrate those several aspects with the perspective of higher achiever students. So the research question guiding this study is as follows: How do the students with high achievement coming from several engineering courses understand the role of their teachers? It is the aim of this article to identify the most valued characteristics of teachers from the student perspective as well as to understand the perceptions of students on the influence their teachers have on the development of their greater talent and achievements.

II. Method.

A. Participants.

The participants presented in Table 1 are ten Portuguese engineering students with an average grade equal to or higher than 16 (in the range from 0 to 20). The number of students in this cohort normally represents one to two percent of the total number of students in the third, fourth and fifth years of engineering courses at the University of Minho, which significantly reduces the number of potential participants eligible for the study of the phenomenon. These students were classified A (excellent), which, according to the classifications of the *European Credit Transfer and Accumulation System (ECTS),* corresponds to 10% of the total number of students. The identification of the participants was made through the award lists representing the best students from the university. The first and second year students were excluded in order to ensure that there was a continuous and consistent pathway of high performance, and that students with isolated situations of success were not under consideration.

Table 1. Participants.

Name	Gender	Age	Year of course	Course
Participant 1	Male	22	5th	Industrial Electronics and Computer Engineering
Participant 2	Female	22	5th	Biomedical Engineering
Participant 3	Male	23	5th	Informatics Engineering
Participant 4	Male	23	5th	Biomedical Engineering
Participant 5	Male	28	4th	Informatics Engineering
Participant 6	Female	20	3rd	Biological Engineering
Participant 7	Female	22	4th	Industrial and Management Engineering
Participant 8	Male	19	3rd	Informatics Engineering
Participant 9	Female	20	3rd	Biomedical Engineering
Participant 10	Male	20	3rd	Biomedical Engineering

B. Procedures.

The 10 participants, who met the chosen criteria, agreed to participate in a research project about academic excellence in the engineering domain. Then, individual interviews of 40 to 60 minutes were scheduled and conducted with participants. The general purpose of this research project was to achieve an in-depth understanding of the specific subject, which applies to a restricted proportion of the student population. Therefore, the participants represent a purposive sampling of a few specific cases.

The interviews were transcribed verbatim to ensure that the entire conversation was recorded, documented, as well as other important elements of the interviewer-interviewee interaction (e.g., hesitations, exclamations, laughs). In order to standardize the interviews, a guide was developed, which included topics that emerged from the theoretical review, according to the suggestion of Bogdan and Biklen (2002). The interview guide was then evaluated by psychological supervisors, who assessed its validity, clarity and adaptation to the participants and the aims of the study, as recommended by Whittemore, Chase, and Mandle (2001)**.** The

interview consisted of collecting generic data from the participants, followed by questions to explore self-reflections about their biographical pathways. The topics questioned were the previous and current academic experience, self-conceptions, perceptions of competency, the role of significant people in the pathway, and the future projects of the participants. These methods assisted the research team in understanding the perceptions of participants about the role of their teachers. Specific questions were formulated taking into account the suggestion of the literature about the role of incentive and support figures for the development in high achiever individuals (Gagné, 2004; Kaufmann et al., 1986; Renzulli, 2002) or as mentors that follow the development of expertise (Ericsson & Lehmann, 1996; Ericsson, 1998). Some of the questions were as follows: "Which characteristics do you think are important in a teacher?"; "Which characteristics do those people who influenced you have?"; "What was the teachers' role through your pathway?"

C. Data analysis.

The procedure of content analysis proposed by Schilling (2006) followed the data collection phase of this investigation. This particular phase consisted of a process of data analysis with a preliminary categorizing system developed that utilized the literature review as an artifact. The grid of that preliminary category system was then applied by three different researchers on several interview transcripts. After that procedure, the team discussed the main divergences until it reached a consensus and then the necessary categories were reorganized.

The excerpts in which teachers were mentioned or in some way referred to were then separated out. The computer software MAXQDA (Verbi, 2007) was used to analyze the interviews by performing computer-assisted qualitative data analysis, which functioned as a tool facilitating the process of organization, visualization and systematization of the data collected. An open coding was then performed, which consisted of decomposing the data into units of analysis. The definition of units of analysis followed the criteria proposed by Tesch (1990) and represented "segments of text that are comprehensible by themselves and contain(s) one idea, episode, or piece of information" (p. 116). A code was assigned to each segment that encapsulated its meaning and, subsequently, a systematic comparison across the new information waiting to be coded and the information already coded was performed. This last procedure was based on the methodology of Strauss and Corbin (1990).

III. Results and discussion.

Five categories emerged from the data collection and they are as follows: affective and emotional relation, motivation, recognition, instruction style, and demand. For each emergent category, the main aspects descriptive of the category were explored. Short excerpts from the interviews were also selected based on their representativeness and to exemplify the general meaning of each category presented below. The interviews were carried out in Portuguese, so it was necessary to make some translation adaptations so that some of the quotes made sense.

A. Affective and emotional relation.
- Patience
- Availability
- Openness

The relationship between teachers and students seems to have had an important impact on the development of the students. This relationship manifested mainly through the patience, availability and openness of the teacher. The affective and emotional component is expressed in several ways with major emphasis on the personal characteristics of the teachers and the values transmitted to students daily in their established relationship:

> To be patient, when we don't understand something. (Participant 1).
>
> (…) those [teachers] who make themselves available to help with homework and to answer questions about tests. (Participant 2)
>
> It is important. Especially some of them, they are much more available to us than we expect them to be. This was the case of some teachers who are not teaching us any specific subject at the moment, but that had already been our teachers, and nevertheless they still provide us support if we request. (Participant 7)
>
> (…) I think that openness is important, it doesn't create a barrier... that barrier of the 'I'm here, I'm the teacher, you are there, you are the students' teacher. I think if ... if we forget that and if we behave as peers… I think that is important. (Participant 6)

These findings corroborate some other studies, which registered a positive correlation between the emotional involvement of the teacher and a student's academic engagement (Skinner et al., 1993) or their perceptions of competence (Skinner et al., 2008). In the case of these high achiever students, the quality of the affective and emotional relationship with their teachers arises as an important ingredient that is highly valued. These students seem to appeal much to the help from teachers, so a teacher's approachability can make room for a better level of responsiveness to the specific needs of these students.

B. Motivation.
- Influence to the subject interest of student (way teachers give lessons)
- Incentive and stimulus for task engagement
- Role model of the motivation of student

The attitude of the teachers seems to have an important influence on students and can make a great difference by challenging and stimulating students to progress in learning. It seems that the way teachers engage students into subjects can even influence the quality and quantity of the investment that students will put on their academic tasks:

> ... a lot of the motivation isn't related to the content but rather is a result of the way the teacher gives the lesson, their attitude. This is one of the main reasons for my lack of motivation, when I don't like a teacher, I can automatically feel a lack of motivation to do anything (Participant 3).

The literature has given some indications about the importance to consider individual characteristics in specific situations to understand personal motivation (Paris & Turner, 1994). The interaction between the participants and the context – in this case, through the central figure of the teacher – seems to determine the affective consequences and actions of students.

Some participants referred to teachers as important figures to arouse the interest of their students, introducing the curiosity and engagement to the subjects:

> The teacher has to teach and I think that teaching is the only way to kindle more curiosity in the student, to get more involved with the subject.
>
> [Do you think it is important to "kindle the curiosity"?]
>
> I think it is, and I think that should be mainly done by the teacher. Because we

> assume that the teacher has a more close contact with the subject and I think it is him/her that must transmit us: "look, this subject is interesting". (Participant 7)
>
> One of the teachers who most influenced me was my math teacher of 7th grade. She did the same as I did: she turned the math classes into games. She was able to do games, she did a lot of things that... for example, a simple figure to connect points with, around 10 equations. We had to solve the equations and then connect the points with the results. She did many exercises of that kind. She probably was one of the persons who most influenced me, because she did what I also did, turning the subject into a game. (Participant 8)

Taking into account that mastery is the result of a sequence of stages of progressive development of skills (Martens & Witt, 2004), the teachers can act as important catalysts for the development of these students with promising potential through the progressive stimulation and the encouragement of learning. That action of providing assistance to a student on an as-needed basis meets the definition of *scaffolding* provided by some authors (Molenaar, van Boxtel, & Sleegers, 2011; Wood, Bruner, & Ross, 1976). That constructivist perspective of learning is also discussed by Savery and Duffy (1995) when they refer to the learner's "puzzlement" as being the stimulus and organizer for learning, whereby the teacher can make room for students to develop an active involvement into the process of learning.

The teachers are also important role models for the development of the passion and motivation of the students for their specialization:

> I admire the teacher, I know he is someone who knows a lot about my subject, electronics, with an emphasis on communications, and I try to understand everything that I can… (Participant 3)
>
> (…) there are some teachers whom I really enjoyed, they were like models, because I liked them, you know... (Participant 1)

Some other studies have referred to the teacher as an important model for their students in the development of passion and motivation for learning as well as future professionals (Carbonneau, Vallerand, Fernet, & Guay, 2008; Mckeachie, 2002). Moreover, our findings illuminated that teachers become role models or someone who the students can identify with when they feel an admiration for them. The teacher, as a role model, can then function as a model of success in order to simultaneously stimulate the success of their students.

C. Recognition.
- Recognition of the ability and potential
- Invitation to integrate projects

The recognition of the students by teachers serves as a positive reinforcement and seems to motivate participants. In particular, recognition of the ability and/or potential of the students and invitations to participate in projects can create positive attitudes amongst the students. In the words of a participant:

> (…) knowing that my teachers think I am capable based on the things I have done in class and on the personal projects I am involved in (…) I think that most teachers felt like I was one of the people interested in the materials we have to study. I can give an example of my present supervisor and course director… who I think likes me in good faith (Participant 4)

Students demonstrated in some situations to put an intentional effort for teachers to realize the quality of their work:

> When doing projects in my area I try to figure out whatever I can do, so that they will look at it and say "this [a piece of work] shows something very well done." (Participant 5)

Participant 2 also referred to the recognition of her teacher through invitations to work with him:

> …I had a class last semester with a teacher and this semester he invited me to do a parallel project about biomedical engineering in Portugal (…) and now I have been invited to continue on a doctoral program as well.

This seems to signify that it is not enough for these students to recognize their own personal abilities – positive perceptions of self-competence – they also need their potential and abilities to be recognized by others, especially by their teachers. This external recognition functions almost like a motor for their academic involvement by giving them the power to continue pushing forward.

This recognition can have a special emphasis in the case of high achiever students considering their most notable efforts in relation to their work. The research on giftedness has been addressing some attention to the issue of identification of talents and to the development of appropriate educational programs (e.g., Feldhusen, 1996; Freeman, 1998; Renzulli, 2005). However, it seems that regardless of the existence of those programs, the teachers have an important role recognizing the potential that can become concretized on opportunities to demonstrate, apply and promote interests and capacities of their students.

D. Instruction style.
- Mastery of subject
- Ability to transmit knowledge

The instruction style is discussed here as the particular way a teacher transmits material to students. Participants focused on two essential aspects in this category: mastery of the content to be taught and the ability to transmit knowledge. These concepts are illustrated in the interviews with students:

> …I think that it is his knowledge of the material (...) he was also my teacher in other disciplines and he actually knows a lot about the subject, he knows what he is teaching, so I try to learn as much as I can. (Participant 4)

Participant 5 also expressed the importance of the efficient transmission of knowledge:

> I think a teacher who knows how to teach is someone who knows how to explain things in different ways, when we ask a question.

In addition, the participants commented critically on the situations in which their teachers did not have these characteristics:

> …they [teachers] have to master the material. Incredibly, we have already had some teachers who pretty much don't know anything about what they're trying to teach us. They just read the slides and if you ask a question that is slightly off the topic, they don't know the answer (…) and this kind of thing should not happen at the university (Participant 5).

The instruction style, therefore, is pointed out by participants as the result of a combination of the teacher's knowledge of the subject content and of pedagogical skills. These findings can be corroborated with other studies illuminating students' experiences in general, which pointed to the combination of the mastery of the subject with the mastery of teaching methodologies as characteristics of the best teachers (Krauss et al., 2008; Smith & Strahan, 2004).

E. Demand.
- Continuous stimulation in order to progress
- Demanding assessment

The participants discussed the value of high demands in the academic context. This demanding atmosphere seems to be related to the need to have favorable learning conditions and the need to be stimulated by the teacher in order to progress academically. In the words of two participants:

> I always preferred teachers who were more demanding, than teachers who were like... give away everything already done. I don't like those teachers. I think I'm the opposite of my colleagues. The worse is the teacher, the better for me. Because it makes me feel the need to show that I am worth something (…) I don't content myself with low marks. I want to be the best (…) I don't like teachers who are very relaxed, and that easily give good marks to students. Because sometimes I study very hard and I apply myself a lot and the test questions are really basics (…) and I get sad because 'how will I show my knowledge?' (…) I like to be challenged. (Participant 9)

> (…) I think it should be a little demanding in order to keep us moving. (Participant 1)

> A teacher who I really liked was a professor of electromagnetism that I had in the 2nd year. That teacher, was quite demanding at the beginning of the year and we keep that idea of her, that she was quite demanding (…) and that also contributed a lot to me to study more and to have a best performance in that subject. (Participant 10)

The participants illustrated what was expected taking into account the recommendations of the literature (Chickering & Gamson, 1987; Heller, 2004; Tomlinson et al., 2003): the importance of the learning process to be adapted to the individual characteristics of each student in order to promote their maximum development. In the specific case of talented students, the implementation of appropriate levels of motivational challenge, in addition to appropriate teaching, learning and assessment, emerge as relevant aspects to keep students academically engaged and fulfilled.

IV. Conclusions and implications.

Data collected from these interviews with purposively selected participants leads to the following conclusion. Teaching and teaching contexts are important for these high achiever students and that importance can be synthesized into three main aspects that are valued in a teacher and in the context of learning: (i) the quality of the affective relationship that teachers establish with their students; (ii) the ability to transmit knowledge and stimulate students to learn; (iii) a demanding context, which encourages and keeps them motivated. These aspects match some of the principles for good practice in undergraduate education summarized by previous authors (Chickering & Gamson, 1987; Kuh et al., 2006). Namely, an intentional focus on keeping contact with faculty members; to encourage active learning; to provide feedback and opportunities to improve performance; to have high expectations of students ("expect more and you will get it"); to respect diverse talents and ways of learning (Chickering & Gamson, 1987). The main difference seems to be found in the adaptation of these aspects to the specific needs of high achiever students. For example, attending to their higher level of learning and being continuously adjusted to students' responses is essential to challenge and inspire these students.

High achievers tend to be more sensitive, to request more from their context and to seize the opportunities provided throughout their pathway. They prefer more demanding and stimulating contexts compared to the average of students, because they can achieve more and they like to feel continuously challenged by the content being taught. That can make the difference in terms of what they valorize and the profit they take from their experience.

On the other hand, the five categories identified seem to converge to emotional and volition factors of learning, in which the teacher is pointed as a key element through several stages of learning: to arouse the interest and curiosity of students to learning; to keep students engaged with learning, providing stimulating contexts and offering their availability to help when necessary; and to act as a model of passionate and successful professionals. From the perspective of these participants, learning is much more than the simple transmission of knowledge. These results illustrate the complexity of issues inherent in teaching tasks and learning, which is consistent with the position of Korthagen (2004). Clearly, learning is not the product of purely cognitive factors, but it is also affected by emotional, volitional and behavioral aspects.

Finally, the data obtained and subsequent findings extrapolated from this study have implications for teaching and learning in higher education. The data collected draws attention to the importance of adapting learning environments to the needs and characteristics of the students. It is crucial that high achievers find enough stimuli and challenges in their learning contexts to develop to their full capacities; not only as students, but as future professionals. What then can be some good, potentially transferable practices for high achievers students?

1. Be available to discuss subjects of the students' interests outside classroom.

2. Give students space to explore. Give them space to expand and create thinking opportunities. Do not only be attached to the curricular program

3. Share the enthusiasm for the subject and for learning in general. Talk to students about subjects and aspects of your field that fascinate you.

4. Stimulate students' curiosity. Identify daily problems to solve and apply theoretical subjects into it.

5. Teach research skills that can allow them to recognize, describe, and understand more about what fascinates them.

6. Make challenging proposals to them, discussing with them themes of interest which can be objects of or catalysts for learning and assessment or potentially integrate extracurricular projects.

7. Show attention and recognition to their work and achievements, but also to their efforts to progress.

To conclude, the participants are searching for and preferring more inspiring environments and teachers who complement their unique academic characteristics. If these students ask for more and better, then it should be given more and better. Obviously, not all the students fit at the top of performance or can be recognized as high achievers, but it is important that those who can achieve that peak have the right path to get there and sustain high levels of engagement and achievement once on that right path.

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Faculty perceptions of multicultural teaching in a large urban university

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Abstract: As college graduates face an increasingly globalized world, it is imperative to consider issues of multicultural instruction in higher education. This study presents qualitative and quantitative findings from a survey of faculty at a large, urban, midwestern university regarding perceptions of multicultural teaching. Faculty were asked how they define multicultural teaching, how they engage in multicultural teaching, what they perceive to be the benefits of multicultural teaching, and what barriers to implementing multicultural teaching they experience. Results indicate faculty members most frequently define multicultural teaching as using diverse teaching pedagogies and materials. In line with their definitions, faculty also report engaging in multicultural teaching through use of inclusive course materials. Faculty identified positive learning outcomes for all students as a primary benefit to engaging in multicultural teaching. The primary barrier reported by faculty is an anticipated resistance from students. Variations in responses based on academic discipline and rank of faculty member are discussed.

Keywords: multicultural teaching, faculty perceptions

I. Introduction.

Multicultural education has its roots in the Civil Rights Movement, yet uncertainty about the nature of multicultural pedagogy and practice persists. Lack of understanding of multicultural teaching is evident in spite of the growing literature on theories of multicultural education and data documenting best practices. In the present research, our goal was to examine faculty perceptions of multicultural teaching, including how faculty define and practice multicultural teaching, what benefits faculty perceive of such practices, and what barriers may prevent faculty from engaging in multicultural teaching.

A. What is multicultural teaching?

Although multicultural scholars vary in their specific definitions of multicultural education, several common themes emerge. First, multicultural teaching is student-centered. In part, this is due to increased recognition of racial and gender inequality in housing, employment, and education during the push for civil rights in the U.S. (Gay, 2004a). Educators consequently promoted practices that ensured equal access and opportunities for *all* students (Banks, 2005) and instilled in teachers a responsibility for student advocacy (Bennett, Cole, & Thompson, 2003). One goal of multicultural teaching, then, is to create a safe and caring classroom

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environment (Gay, 2002), with the underlying belief that students will learn more when they have opportunities to share their own personal experiences and perspectives (Gay, 2004b).

Another theme in theories of multicultural education is the promotion of social justice and democratic principles (Bennett et al., 2003; Nieto, 2004). More specifically, faculty should have the goal of helping students develop into democratic citizens of the world who value diverse perspectives and think critically about solutions to real-world social problems (Kitano, 1997). In the process, teachers and students alike have the opportunity to recognize and combat their own prejudices (Banks, 2005, Gay, 2002).

Finally, multicultural teaching is more than delivering course content about diversity. It involves fostering an inclusive climate in the classroom and a sense of community among students; and facilitating student learning with a variety of instructional techniques and assessments (Gay, 2004b).

Although numerous scholars have discussed what multicultural teaching means and how it is practiced in the classroom, it is unclear whether college faculty members have a good sense of multicultural pedagogy and best practices. Thus, one purpose of the present research was to ask them what they believe multicultural teaching means and what, if any, multicultural teaching practices do they employ.

B. Why engage in multicultural teaching?

Research has documented numerous student benefits to multicultural teaching. First, it prepares students for working and living in an increasingly diverse world (Gaff, 1992; Morey & Kitano, 1997). In addition, the experience of a safe classroom empowers students by giving them an active role in learning and by validating their experiences, and it enhances students' sense of connection with each other (Gay, 2000). Indeed, research increasingly recognizes the importance of a sense of belonging for student success (Hausmann, Schoefield, & Woods, 2007; Walton & Cohen, 2007). Finally, research demonstrates that multicultural teaching practices enhance learning for all students, regardless of what groups they belong to (Hurtado, Milem, Clayton-Pedersen, & Allen, 1999).

For faculty, multicultural teaching provides an opportunity to learn about other cultures, consider diverse perspectives, and improve communication with students from diverse backgrounds (Gay, 2002). Furthermore, it allows faculty to engage in productive self-reflection, whereby they may identify and confront their own biases (Bennett et al., 2003).

A second purpose of the present research was to assess whether faculty members are aware of these and other benefits of multicultural teaching. Given that multicultural pedagogy is often not part of the graduate training experience in many disciplines, we suspected that many may have little insight into the value of multicultural teaching for students or for themselves.

C. What are the challenges in multicultural teaching?

There are, of course, challenges in multicultural teaching. For example, it may require instructors to reinvent syllabi, assessments, and general classroom delivery. As such, it can be time consuming and effortful. In addition, some faculty may be uncomfortable with the necessary self-reflection and the possibility of uncovering personal biases. Finally, recent research provides reason to anticipate backlash to multiculturalism from some students. Specifically, Whites are more likely than racial minorities to associate multiculturalism with exclusion, and, to the extent

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that they do, they are less likely to support programs and organizations that emphasize diversity (Plaut, Garnett, Buffardi, & Sanchez-Burks, 2011). Furthermore, many White Americans see racism as a "zero-sum game" in which progress toward equality for minorities must mean increased prejudice toward Whites (Norton & Sommers, 2011). Together, these findings suggest that faculty must find ways to emphasize the inclusion of *all* groups when teaching about multiculturalism.

One last purpose of the present research was to examine the barriers to multicultural teaching as they are perceived by college faculty. Some common perceived obstacles include lack of knowledge of multicultural content and lack of formal training in multicultural pedagogy. If we are to encourage instructors to engage in multicultural teaching practices, it is imperative to understand the perceived obstacles.

II. Method.

A. Participants.

All teaching, non-medical school faculty members at a large Midwestern urban university were invited to participate in the study through e-mail invitations. A total of 464 initiated the online survey and signed the informed consent statement. Assuming that all of the 1064 eligible faculty received and read the e-mail invitation, we had a 43.6% response rate. Of the 464 who signed the consent, 340 (73.27%) completed the survey. While demographic information on university faculty and the schools or colleges representative of the survey respondents was collected, as shown in Table 1, no personal demographic information was collected from the survey participants. Since some departments and schools had only one or two individuals fitting certain demographics (e.g., gender, ethnicity, or age), we intentionally did not collect this information in order to increase the likelihood of anonymity and therefore participation.

B. Procedures.

Multicultural Teaching Community of Practice (MTCoP). MTCoP, who initiated this study, is a collective of scholars from various disciplines and with broad background and interest in diversity education at a large, Midwestern urban university.

In October 2007, MTCoP sent two e-mails to a total of 1064 faculty throughout the university, with the exception of Medical School faculty. The intent of the study as articulated in the invitation to participate was broadly stated: "to understand the teaching practices and attitudes of faculty." Interested faculty members were then directed to a link to Surveymonkey.com where participants were provided an informed consent statement which discussed the voluntary nature of participation and anonymity of participants. The potential participants were told that the survey would take approximately 10-20 minutes to complete. The site was then closed one month after the initial e-mail was sent and the data was downloaded from the site.

C. Measures.

We obtained information about school, rank, number of students and hours taught from each respondent. Four open ended questions that assessed attitudes and knowledge about multicultural

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teaching were asked: please tell us your current understanding of the concept of multicultural teaching (definitions); if you do engage in multicultural teaching, how do you do it (practice); please explain what you perceive as the benefits of multicultural teaching (benefits); please explain what barriers you have encountered to multicultural teaching (barriers).

Table 1. Frequency of Open-ended Question Codes by School (n = 245).

	Liberal Arts	Sciences	Nursing	Education	Others
	%	%	%	%	%
Definitions of MT: *Teaching that*					
Acknowledges cultural lens of research	7.9	8.3	0	17.4	7.1
Encourages students to share	46.1	20.8	52.2	34.8	52.1
experiences**	19.1	14.6	17.4	17.4	14.1
Teaches about different cultures and	36.0	56.3	39.1	65.2	43.7
lifestyles					
Uses diverse pedagogies and materials*	17.9	5.1	47.6	16.7	29.4
Benefits of MT: *Helps students in*	46.4	33.3	42.9	50.0	42.6
Preparation for the World**	48.8	71.8	19.0	37.5	35.3
Development of cultural sensitivity					
Learning/beneficial to the classroom**	53.3	8.6	22.2	52.2	40.0
Barriers to MT:	6.7	37.1	33.3	21.7	30.0
Students do not want it**	32.0	28.6	38.9	21.7	23.3
There is no help for this work**	8.0	25.0	0.0	4.3	9.9
Instructors do not know how to do it					
Instructors do not want to do it*	49.3	53.3	62.5	62.5	59.3
How do *you* do MT:					
Exposure students to culture and	30.1	26.7	25.0	50.0	25.9
enhance classroom environment	6.9	10.0	6.3	4.2	3.7
Use diverse pedagogical techniques	67.6	50.0	52.9	54.2	63.0
I work on my own awareness of MT					
I use select materials purposefully					

*p < .05; ** p < .01

III. Results.

A. Descriptive Statistics.

School. Most respondents came from the Schools of Liberal Arts (n = 105; 30.9% of sample), Science (n = 66, 19.4%), Nursing (n = 29, 8.5%), and Education (n = 26, 7.6%). The rest were combined into an "Other" group and included the Schools of Dentistry, Law, University College, Business, Informatics, Music, Health (e.g. radiological Sciences), Engineering and Technology, Public Affairs and Environmental Sciences, and Art.

Rank. We grouped rank by Full (n = 79, 23.2%), Associate (n = 84, 24.7%), and Assistant (n = 58, 17.1%) tenure-track faculty, Lecturers (n = 79, 23.2%; Senior and Junior), and Others (n = 40, 11.8%; Clinical, Research, Visiting, Part-Time, Adjunct, and Librarians).

Response Rate. Of the 340 faculty who participated in the survey, 77% responded to at least one of the open-ended questions. If examined by rank, participation in open-ended questions ranged from a high of 83.5% for lecturers to a low of 72.5% for Other ranks. Examined by school, Education faculty responded to the open-ended questions at a rate of 88.5%, followed by Liberal Arts at 84.8%, Nursing at 79.3%, Science at 72.7% and Other at 70.3%.

B. What is Multicultural Teaching?

A total of 262 participants (77% of sample) responded to this item. The vast majority of the responses to the qualitative survey question asking for a definition of multicultural teaching discussed inclusive learning. Responses ranged in regard to the sophistication of the definition and the focus of what constitutes "inclusion." Four specific themes of how to achieve inclusion emerged from the data. A large number of responses focused on multicultural teaching as constituting the use of diverse pedagogies and curriculum materials. Several also discussed developing ways to value all the voices of diverse students in a classroom. Fewer of the responses defined multicultural teaching as meaning to teach about a variety of cultures and lifestyles. Finally, a few mentioned discussing empirical literature from an understanding that all science is interpreted through the cultural lens of the researcher.

Respondents who defined multicultural teaching as using inclusive pedagogies and course materials explained that multicultural teaching requires instructors to find ways to engage students regardless of their background. As one respondent explained, multicultural teaching is "formulating the course material, activities and delivery so as to reach each member of the class independent of her or his social, economic or ethnic background."

Others defined multicultural teaching as finding ways to encourage students in the classroom to share their own experiences. As one respondent stated, "I must make an effort to understand the cultural perspectives of my students and make sure the classroom is a welcoming place for all students' full participation."

Another common definition of multicultural teaching was teaching about different cultures, and encouraging students to consider subjects from multiple angles. For example, one respondent said, "I understand [multicultural teaching] to mean that both the content and theoretical underpinnings of teaching strive to incorporate diverse perspectives--perspectives that look beyond European and Euro-American models." Others discussed teaching about all the diverse voices that have shaped a discipline, and the need to examine how multiculturalism will impact students' future careers.

A smaller number of definitions included "being aware of how diversity influences the research we are discussing, [and] how cultural differences may impact how material is interpreted."

C. How is Multicultural Teaching Practiced?

A total of 205 participants (60% of sample) responded to this item. Four primary themes emerged from faculty responses regarding how they engage in multicultural teaching. The most common method expressed was by incorporating multicultural teaching materials into the course. Many faculty members also reported enhancing students' learning experiences and exposure to culture. Others use diverse pedagogies, and a few reported developing their own professional knowledge of multicultural issues and pedagogy.

The practice most used by respondents was the integration of multicultural teaching materials into their course. One faculty member explained, "I choose texts that include other viewpoints; I use examples in class that draw from other cultures." Another discussed several opportunities for integrating multicultural materials in case vignettes, by "discussing research studies with similar problems addressed in other parts of the world…[and] news that addresses issues discussed in class with an international/diverse element."

The second most frequently reported way of engaging in multicultural teaching was to enhance student learning experience and exposure to culture. These responses involved inclusion of experiential learning components. For example, one respondent discussed the opportunities in her course: "We go into many different service components of dentistry: clinics, homeless shelters, abuse shelters. We incorporate live clinical experience, check for prior knowledge of culture and have a reflective component afterwards."

Fewer respondents expressed multicultural teaching through using diverse pedagogical theories or techniques, and the smallest number discussed professional development of the instructor. One faculty member said, "I make time to read journals and attend conferences and symposia addressing multicultural teaching strategies."

D. Benefits of Multicultural Teaching.

A total of 245 participants (72.1% of sample) responded to this item. The most common benefit of multicultural teaching as reported by faculty was that it is beneficial to student learning in the classroom. Many responses also cited a benefit of increased cultural sensitivity among students. A smaller number of faculty mentioned the benefits multicultural teaching can have on preparing students for work in an increasingly global society upon graduation.

Faculty most frequently reported that multicultural teaching benefits student learning because it created a more inclusive and safe climate in the classroom. Multicultural pedagogies were said to allow discussion of bias and prejudice, which led to broadened learning perspectives of students and better buy-in and engagement of diverse perspectives of students. One respondent said, "multicultural teaching helps make everyone feel comfortable learning." Another stated that multicultural teaching leads to students having more "awareness that a students' background impacts their perspective, and that integrating their background into the teaching experience creates engagement." Multicultural teaching was described as essential for teaching students the importance of "open-mindedness, tolerance, patience" and their development of non-judgmental communication skills.

Respondents also reported that multicultural teaching assists in developing cultural sensitivity skills in students because it ensures that students appreciate, recognize, value, and respect perspectives of others. One respondent said, "students will hopefully learn not to be judgmental of other people's practices and beliefs." Another explained that multicultural teaching is "inclusive and respectful and provides students with a balanced view."

Fewer faculty responded that multicultural teaching prepares students for working in our global world. It was reported as beneficial in teaching students to understand the value of global citizenship and giving students better life preparation for working with diverse communities. As one respondent explained, multicultural teaching "helps students understand and appreciate different perspectives and prepares students for the real world." Another reported that "it helps students to become better citizens of this society and this world, it is more interesting and it is ethically right." One respondent warned of the dangers of not using multicultural teachings

strategies: "students who do not learn to work well with those of other backgrounds will not succeed in the world of work, furthermore multiculturalism introduces new ways of thinking of various issues and prevents group think."

E. Barriers to Multicultural Teaching.

A total of 217 participants (63.8% of sample) responded to this item. The most commonly expressed barrier to multicultural teaching as perceived by faculty is student resistance. Many faculty also cite their own lack of preparation in using multicultural teaching strategies; however, almost as many faculty also acknowledge frustration at the lack of institutional support or guidance to assist them in engaging in multicultural teaching.

The most frequent response from faculty regarding barriers to multicultural teaching was their anticipation of student resistance. The reality of this resistance was felt most acutely by faculty who had attempted to incorporate multicultural teaching in the past and witnessed a backlash expressed through student evaluations. This is a real concern for those faculty who are tenure-track and thus dependent upon these evaluations for successful promotion and tenure at an institution. Other faculty reported that they were hesitant to introduce multicultural content for fear of majority students taking a defensive stance or simply "shutting down" when challenged with issues of social justice and inequality. One respondent identified student resistance as manifested in a lack of appreciation for cultural differences, thus defining the barrier as "primarily the difficulty in appreciating the fact that other people do legitimately see things in a different way than we do -- due to experience, culture, and other background."

Many faculty identified a general lack of knowledge of multicultural teaching pedagogies as a significant barrier. For example, one faculty respondent defined the barrier as a "lack of my understanding all other cultures related to perspective, behaviors, and environment." The majority of faculty simultaneously expressed a desire to engage in multicultural teaching but did not know where to begin in terms of acquiring the necessary knowledge and skills to do so.

In congruence with unpreparedness for multicultural teaching, another common theme emerging from the data was a frustration over the lack of training, support and resources available. Many cited the absence of such training made available to them during their graduate training. Others expressed continuing lack of training in their current roles. They placed responsibility on the institution to provide faculty with the training, time and resources necessary to create an inclusive learning environment. One respondent stated "Good exercises that are non-trivial are hard to come by." Other faculty reported that the institution provided no real incentive to engage in multicultural teaching, which was perceived as an additional exercise of time and energy that would go unrewarded. Resources needed to engage in multicultural teaching were also reported to be scarce. For example, one respondent stated, "Being a chemist, many textbooks are somewhat limited in including multicultural material pertaining to the historical and current trends in this particular field." Another identified "the lack of cultural diversity among students in the class" at a predominantly white institution as a lack of multicultural "human" resources, which could be tapped into as a means of creating a more conducive learning environment.

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Table 2. Frequency of Open-ended Question Codes by Rank (n = 245).

	Full Professor	Associate Professor	Assistant Professor	Lecturer	Others
	%	%	%	%	%
Definitions of MT: *Teaching that*					
Acknowledges cultural lens of research	5.2	8.1	4.3	9.1	10.3
Encourages students to share	34.5	53.2	46.8	36.4	44.8
experiences	20.7	12.9	19.1	16.7	17.2
Teaches about different cultures and	37.9	45.2	40.4	53.0	44.8
lifestyles					
Uses diverse pedagogies and materials	27.8	18.2	23.8	12.9	31.3
Benefits of MT: *Helps students in*	42.6	49.1	47.6	41.9	25.0
Preparation for the World	40.7	40.0	50.0	48.4	50.0
Development of cultural sensitivity					
Learning/beneficial to the classroom	39.6	37.7	48.6	38.5	40.7
Barriers to MT:	20.8	30.2	13.5	21.2	22.2
Students do not want it	29.2	20.8	29.7	26.9	37.0
There is no help for this work	10.2	11.3	7.9	13.5	0.0
Instructors do not know how to do it					
Instructors do not want to do it	62.5	47.9	59.5	48.1	69.2
How do *you* do MT:					
Exposure students to culture and	22.5	29.8	24.3	31.5	42.3
enhance classroom environment	0.0	12.5	2.7	9.4	3.8
Use diverse pedagogical techniques	57.5	70.2	60.5	62.3	42.3
I work on my own awareness of MT					
I use select materials purposefully					

Note: no differences among groups for any of the open-ended question codes.

F. Negative Responses to the Survey.

While the majority of responses demonstrated at least a minimal understanding of and appreciation for multicultural teaching, approximately 5% of respondents responded negatively to the survey. Most of these responses related multicultural teaching either to politics or lowering standards in the classroom. For example, one participant said it was "an utter waste of time and a duplicitous means of dumbing down the college curriculum ….." and another wrote "I believe this is an unclear concept based in political ideology." Others did not see the value of multicultural teaching in their specific subject matter; one respondent explained, "Presenting material from differing points of view is very often not desirable when teaching a hard science - the facts are the facts and not open to interpretation based on your cultural group."

G. Differences by Rank and School.

We conducted chi square analyses to examine whether the responses to the open ended questions differed by rank or school. Specifically, we created codes for the open-ended responses, and coded each individual according to whether s/he had produced that response or not. We found

differences by school, but not by rank, in the categories of definitions, benefits and barriers (see Tables 1 and 2). Specifically, faculty in different schools differed in the percentage that offered *encourages students to share experiences* ($\chi^2(4)$ = 13.81, p = .008) and *use diverse pedagogies and materials* ($\chi^2(4)$ = 9.57, p = .048) among the definitions codes. In the benefits codes, they differed in the percentage that offered *preparation for the world* ($\chi^2(4)$ = 18.13, p = .001) and *learning that is beneficial to the classroom* ($\chi^2(4)$ = 20.66, p < .001). Faculty from different schools differed in three barriers, specifically, the percentage that offered responses within the codes of *students do not want it* ($\chi^2(4)$ = 23.85, p < .001), *there is no help for this work* ($\chi^2(4)$ = 18.37, p = .001), and *instructors do not want to do it* ($\chi^2(4)$ = 12.60, p = .013). In terms of practice (Table 1), Liberal Arts made the most use of the method of *incorporating multicultural teaching materials* with 67.8 % of their respondents answering in the affirmative. The next most frequently used practice was *enhancing the student learning experience and exposure to culture*. Both Nursing and Education reported a use of 62.5% in this category. Education reported the largest *use of diverse pedagogical techniques* with 50% indicating using this practice. Ten percent of Science faculty indicated that they *worked on their own professional development* in multicultural teaching practices with Liberal Arts faculty following at 7%. Associate Faculty had the highest use of any practice with 70% of them responding that they *used diverse materials* (Table 2). The lowest usage of practice was by Full Professors, none of whom indicated that they *worked on their own professional development in multicultural teaching*. They preferred the practice of enhancing classroom environment at 62.5%. Assistant Professors also preferred the *use of diverse materials* at 60.5% as did Lecturers at 62.3%.

IV. Discussion.

Multicultural teaching as a pedagogical approach is needed given the global shifts and demands present in 21st century education. Previous studies have focused more on students and their interactions in the classroom, in terms of classroom climate and access to multicultural content. We wanted to focus on assessing faculty, in order to examine faculty perceptions of their understandings of multicultural teaching and their current teaching practice.

In the present study, we assessed multicultural teaching beliefs and behaviors among faculty in an urban, Midwestern university. We obtained responses from 340 faculty from a variety of schools who completed both quantitative and qualitative assessments. Most of the quantitative assessments were reported elsewhere (Khaja et al., 2010). In the present study, faculty were asked open ended questions to assess how they define multicultural teaching, if and how they engaged in multicultural teaching, and what they perceived to be the benefits and barriers to multicultural teaching.

Over 70% of the faculty completed at least one of the open ended questions, suggesting at the least good will, and to some degree probably interest in the topic among the faculty. While a small proportion responded very negatively, most provided very appropriate responses. In these responses, they showed knowledge of what it was, its benefits and how to do it. They also identified some interesting barriers that may be helpful to those attempting to increase this approach to teaching. Our findings are similar to those of Johnson and Inoue (2003) who conducted a similar study with faculty from the University of Guam. In both cases, interest in multicultural teaching as a best practice was hampered by barriers that impacted faculty behavior.

After coding the responses to each open-ended question, we examined them across ranks and schools. Interestingly, we found no differences by rank; we did, however, find some very interesting differences by school. These differences may be informative for schools that are interested in increasing this type of teaching.

Regarding the question "what is multicultural teaching," Sciences and Education faculty were more likely to define it as *using diverse pedagogies and materials* such as textbooks, whereas Liberal Arts and Nursing faculty were more likely to define it as *encouraging students to share experiences in the classroom*. Interestingly, faculty in the "Other" programs defined multicultural teaching in both of these ways in similar percentages, probably because the Other category contains faculty from very diverse schools. In fact, multicultural teaching was well-defined by the faculty as a whole, and both of these responses reflect multicultural teaching. The preference for one or the other by faculty in different schools may be more reflective of the teaching style or disciplinary content of coursework in different schools. Science faculty, for example, may have little opportunity to open the classroom for discussion of experiences, and therefore may see the possibility of materials and ways of teaching as more viable in their courses than contributions by students. Regardless, the inclusion of diverse perspectives and the incorporation of curricular materials in the classroom are essential to the creation of learning environments in which all students are able to flourish.

There was general agreement among faculty in all schools that multicultural teaching is done by exposing students to other cultures, enhancing the classroom by creating culturally safe learning environments, establishing individual relationships with students, selecting materials purposefully to bring diversity into the classroom, and using diverse pedagogical techniques. The lowest chosen manner to do multicultural teaching was improving one's own multicultural awareness. The latter finding is particularly interesting since most of the literature in multicultural teaching indicate the need for faculty to engage in critical self-evaluation before attempting to engage in multicultural course transformation (Hyde & Ruth, 2002; Sheets, 2005). The challenge of engaging in critical self-reflection can serve as an obstacle in engaging in multicultural teaching. Anyone who takes the approach in which issues of social justice are introduced and discussed in the classroom must engage in critical self-reflection, to uncover their own experiences with social justice issues. For example, faculty cannot critically engage literature and topics of privilege and oppression with students unless they have first reflected upon their own positionality and experiences related to these concepts. This type of self-reflection, this close-to-homework, like the acquisition of new knowledge bases to incorporate appropriate content is an investment of time. The challenge that advocates for multicultural teaching have is convincing resistant or reluctant faculty that this type of investment will ultimately pay off for themselves and all of their students.

Faculty who do engage in multicultural teaching employ a number of strategies where content is concerned. There may be a selection of critical readings that are inclusive of various perspectives. The content of one's lectures may also feature examples from people of diverse backgrounds. Content, however, cannot be introduced nor implemented without a strong pedagogical approach. The main element of implementation of multicultural content is the infusion of the content throughout the course of the semester. If marginalized by devoting one or two class periods to multicultural content, the project of multicultural teaching falls flat and is rendered ineffective. This is often when faculty members actually witness the most amount of resistance; multicultural content that is simply additive makes students feel that they are being forced to cover such material. An infusion of multicultural content by the faculty member signals

to the students that the content is important enough to be covered over an extensive period of time. Moreover, the faculty member devoting a significant amount of time to multicultural content also illustrates for students that the content is valued. The faculty member also serves as a model for instilling the value of diversity in their students.

In terms of benefits, Liberal Arts, Sciences, and Education faculty reported to a similar degree both *student development of cultural sensitivity* and *an environment of learning in the class that is beneficial to students*. These responses suggest that faculty in these schools see multicultural teaching as having immediate beneficial effects inside the classroom. This is appropriate, as research has shown that classrooms where instructors engage in multicultural teaching witness such benefits as "greater student motivation and self-confidence, stronger critical thinking skills, increased cultural awareness, and a higher level of civic involvement" for all students (Wentzell, Richlin, & Cox, 2010, 1-2).

Nursing faculty reported *development of sensitivity* as did the others, but mostly reported *preparation for the world upon graduation* as a benefit. In the other three schools this benefit was the least offered. It is not surprising that Nursing would offer this benefit, given that Nursing is a professional school and that nurses work in environments that are very culturally diverse, and their ability to do this well determines the quality of care they provide (Saha, Beach & Cooper, 2008). It was surprising to us that it would be the benefit least offered by all other schools, as it is a clear and important benefit of multicultural teaching recognized and highlighted by many in the literature (Banks, 1994; Gay 2004; Morey & Kitano 1997; Peters-Davis & Shultz 2005). These findings may suggest the following: a) that faculty in academic programs may not think of the future professional success of their students in a broader sense; b) that they may not think multicultural teaching prepares them for their future careers; or c) that they may not think students need what multicultural teaching offers to succeed upon graduation. This finding suggests that increased awareness of the benefits of multicultural teaching is needed.

Multicultural teaching is a critical strategy with which to prepare students for an increasingly globalized world. The main objective often assumed through such a strategy is the acquisition of cultural competency skill. Cultural competency allows individuals to effectively communicate cross-culturally because of an awareness of and sensitivity toward difference, which increases their ability to empathize with and respect those that are different (Grote, 2008). It has been defined at the systems level as "congruent behaviors, attitudes, and policies that come together in a system, agency, or among professionals and enable that system, agency, or those professionals to work effectively in cross-cultural situations" (Cross, Bazron, Dennis & Isaacs, 1989 as cited in Grote, 2008). Cultural competency is a skill that is highly sought out in the workforce, particularly in light of increased global processes that would make it crucial to conduct business internationally. Calls to increase cultural competency of professionals are being made for business (Rawson, 2010), law (Perlin & Clain, 2009), and even culinary arts (Edelstein, 2010). Cultural competency also refers to the ability of individuals to broaden their perspectives, to be open to learning about new worldviews. Ultimately, cultural competency is a skill with which people can gain perspective on their own position vis-à-vis the rest of the world. While it is incorrect to assume that every course taught from a multicultural perspective would lead to such valuable and useful outcomes, there is something to be said about initiating multicultural teaching as a vehicle through which this skill can be introduced, cultivated, and incremented.

Multicultural teaching as a strategy preparing students for the world and enables them to grasp the value of cultural pluralism (Grote, 2008). Indeed, it validates cultural pluralism as a

characteristic of our society. It also functions as an approach through which to safely discuss issues of social inequality in the classroom. Students are more apt to critically evaluate current events in society as involving social inequities, to the point where they are able to recognize and acknowledge such phenomena. Ultimately, courses that take a multicultural approach to teaching and learning are best equipped to give students a broader, more complex understanding of the world into which they will enter after they exit the academy (Johnson & Inoue, 2003). Utilizing multicultural pedagogies enables students to engage in active learning, where they take ownership of their education, and leave the class with a deeper sense of themselves, their connections to others, and their placement in the world.

For barriers, some of the challenges faced by faculty in engaging in multicultural teaching include their relative ability to adapt the existing curriculum to include multicultural content. There were reservations expressed on a number of levels, including not knowing where to start in terms of incorporating such content, not having enough time built in to the semester to add such content, or not having mastery in the content areas needed to teach the course from a multicultural perspective. The notion that *students do not want multicultural teaching in the classroom* was the most reported among Liberal Arts, Education, and Other faculty. Science faculty were least likely to report this as a barrier. Instead, they reported *lack of support from administration and others* and the fact that instructors may not know how to do it. In third place, Science faculty reported as a barrier that *faculty do not want to do multicultural teaching*, at a rate of 25%. This is in contrast to all other schools where faculty offered this barrier at a rate in the single digits, or not at all (Nursing). This may relate back to the overall perception by Science faculty that multicultural teaching is a practice best suited for the social sciences, where the development of students' "soft" skills such as cultural competency and collaboration is best accomplished (Usher 2002). While acquiring new knowledge of a subject matter is indeed a task that requires an investment of time, other ways in which to transform one's course can include rethinking the disciplinary content or applying a more interdisciplinary approach to the existing content areas (Nelson, 1996). Ultimately, however, the courses that are most successful in adopting a multicultural teaching pedagogy are those that are intentional in design. This type of intentionality where course design or redesign is concerned also appeared to be a challenge for the faculty.

The notion that students react negatively to multicultural teaching is very interesting and does not match findings of studies that assess students themselves. For example, on a recent Spring 2009 Student Pulse survey conducted at our institution, students indicated the issue of "inter-cultural communication and diversity on campus" as the most "extremely important" issue for them (IUPUI for the IUPUI Office of Planning and Institutional Improvement, 2009). These findings in Liberal Arts and Education should be pursued further to better understand faculty perceptions and how these can be better matched with student expectations. If faculty believe students do not want this, they will be less likely to embrace this teaching even when presented with all its benefits. Science faculty responses also have implications for change. Their responses suggest that they may be more likely to engage in multicultural teaching if they have help from administration in the form of tangible support for efforts, and specifically if that help came in the form of teaching them how to do it. This type of support may be a matter of a simple fix, if such faculty are provided with cross-disciplinary examples of how to go about executing multicultural course transformation (Clark 2002).

A. Conclusions.

Multicultural teaching is not a strategy solely targeted toward students of color, nor is it the sole responsibility of faculty of color to deliver. Indeed, given the historic and current underrepresentation of faculty of color among the professoriate, multicultural teaching cannot be relegated solely to those individuals. It is the responsibility of all faculty, regardless of background, to engage in multicultural teaching. It is incumbent upon all faculty who express an interest in engaging in multicultural teaching to become conversant in matters of social justice. Multicultural teaching is a strategy that should be pursued by any faculty interested in developing critical thinking skills among all of their students, interested in fostering student academic success by making learning more relevant to everyday lived experiences, and interested in adequately preparing students to encountered a complex, 21st century, globalized world.

   Multicultural teaching involves the infusion of multicultural content and pedagogy within the curriculum. The expressed goal of such an endeavor relies upon an emphasis on creating a diverse learning environment conducive to academic achievement for all students. The success of such course transformation must be measured through systematic planning and assessment. However, it is not enough for a faculty member engaged in such teaching, often described in the academy as "experimental," to bear the weight of the responsibility of this type of rigorous assessment. We contend that there must be institutional commitment shown to such projects. Institutions of higher learning must demonstrate a full commitment to this type of curricular transformation, particularly those who state the importance and value of diversity in their mission statements.

   Most institutions of higher learning in the U.S. nowadays have a statement on the value of diversity and its relationship to the overall mission of the campus. This valuation of diversity may find itself squarely in the institutional mission, or in other statements, such as strategic plans, vision statements and value statements. For some institutions, the valuation of multicultural teaching is cited as a vehicle through which the goals of diversity for a campus can be achieved. Students may encounter diversity in a variety of venues, from their dorm rooms to their organizations. The classroom is another site through which diversity is encountered, particularly at urban and commuter campuses, such as ours. Students in the classroom may encounter diversity in the form of their interactions with peers from various cultural backgrounds; unlike their chosen affiliations, in the classroom, students may have access to students from different racial/ethnic, religious, national, sexual orientation, age and class backgrounds. The classroom, then, as opposed to one's social networks, may be the most diverse arena encountered by students on a daily basis. This is perhaps the primary foundation upon which multicultural teaching can flourish.

   It is imperative that faculty tap into the advantages of such an environment in order to allow for a space and time in which students may explore other cultural perspectives in a safe environment, and thereby facilitate both academic and personal growth. In creating safe classroom environments for learning through multicultural teaching, faculty members also effectively create a sense of community among students. In such environments, students not only interact cross-culturally but also have the ability to engage in learning in which mutual accountability and success is fostered. Research has also indicated the ability for multicultural teaching to promote democratic ideals in the classroom, which may then be mirrored in society long after a course is completed. Ultimately, the content and approach of multicultural teaching

prepares students to live and interact effectively in a democratic society. The benefits of multicultural teaching far outweigh the costs of time and effort. It has the potential to educate students to be 21st century global citizens with the requisite skills to understand and interface with the complexity of cultural differences, experiences, and perspectives.

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Peer partnerships in teaching: Evaluation of a voluntary model of professional development in tertiary education

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Abstract: This paper describes work over a three-year period to develop a peer partnership approach to professional development at a dual sector university. The aim of the program, arising initially in one school and then piloted in 5 schools, was to support staff in their teaching practice. Emphasis was on the development of a sustainable model of professional development that could accommodate staff at all levels of teaching experience, including permanent and sessional staff in Higher Education and TAFE. Based on evidence from a university-wide survey of staff attitudes and feedback from initial trials, a five-stage model of voluntary, cross-disciplinary partnerships was developed. Quantitative results suggest the program had impact on pedagogy and skill development as well as enhancing collegial relationships between staff within schools. Suggestions for the future development of such programs are offered.

Keywords: reflective practice; professional development; peer review; peer feedback; staff

The challenges that lie ahead for universities to deliver and continuously improve the quality of learning and teaching are complex and varied. Core to these challenges is the need to provide meaningful continuing professional development (CPD) for the academic workforce. Collaborative peer review, designed to document, critique and improve teaching offers a sustainable approach to CPD that builds collegial relationships and enhances educational capital (Hutchings, 1994).

I. Background.

Peer review of teaching refers to a process of pairing academics who observe aspects of teaching. The review can focus on face-to-face classes, course material or assessment (Barnard, Croft, Irons, Cuffe, Bandara, & Rowntree, 2011), as well as any element of blended or online learning (Wood & Friedel, 2008), such as viewing lecture podcasts, observing management of discussion boards or reviewing elements of online assessment and feedback processes. Partners share their reflections and collaboratively discuss ideas for improvement. It is this collegial sharing of ideas, insights, and techniques that provide both parties with a unique and rich opportunity to enhance the quality of their teaching (Bell, 2001).

Two broad categories of research on peer review of teaching exist. The first includes surveys of staff attitudes prior to participation in peer review. Early work by Britt (1982) and later Keig (2000), and more recently by Barnard et al. (2011) reveals similar themes. Staff typically express positive attitudes towards peer review which predict willingness to engage in

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such programs. Perceived disadvantages of peer review, including the time investment required and feelings of vulnerability, while noted, are not generally strongly endorsed.

The second, larger group of studies evaluates the impact of peer review on participants. Many studies support the value of peer review (e.g., Barnard et al., 2011; Beaty, 1998; Bell, 2011; Bell & Mladenovic, 2008; Brown, 1993; Donnelly, 2007; Hammersley-Fletcher & Orsmond, 2004; Kell & Annetts, 2009; Lomas & Nicholls, 2005; McMahon, Barrett, & O'Neill, 2007; Martin & Double, 1998; Slade, 2002; Shortland, 2004). These studies are generally qualitative in nature and are often based on small pilot programs or case studies.

As McMahon et al. (2011) note, the programs described in these studies vary in the nature of the observations, level of control of the process by participants and how the outcomes are used. Some studies describe peer review that has been incorporated into formal and existing professional development processes, such as a Graduate Certificate in Tertiary Teaching program (e.g., Bell, 2001; Bell & Mladenovic, 2008; Donnelly, 2007), while others are offered as voluntary communities of practice (e.g., Barnard et al., 2011). Some studies have evaluated the use of peer review within the institution's appraisal process (e.g., Hammersley-Fletcher & Orsmond, 2004), while other programs focus on peer partnerships for the individual's own use and professional development (e.g., Donnelly, 2007; Kell & Annetts, 2009). In some studies observers are experienced academics selected by participants (e.g., Bell & Mladenovic, 2008) or educational developers (e.g., Bell, 2001). In other studies observers are genuine peers. In these latter programs, partnerships are typically reciprocal, with both members acting as observer and observed (e.g., Donnelly, 2007). In some studies, training is an embedded part of the process (e.g., Barnard, 2011; Donnell, 2007; Hammersley-Fletcher & Orsmond, 2004; Lomas & Nicholls, 2005); although, it is not always apparent whether training is a mandatory component of participation. In others, training is either not provided or not described (e.g., Bell, 2001; Bell & Mladenovic, 2008; Shortland, 2004).

Positive outcomes of peer review reported in these studies include the development of new ideas and skills, improvements to and increased confidence in teaching practices, and enhanced collegiality (Barnard et al., 2011; Bell, 2001; Bell & Mladenovic, 2008; Donnelly, 2007; Lomas & Nicholls, 2005). Concerns and reservations raised by participants include apprehension at the start of the process and negative reports of the time investment required (Bell, 2001), as well as concerns about the confidentiality of the process and difficulties giving and receiving negative feedback (Hammersley-Fletcher & Orsmond, 2004).

In general, studies evaluating the impact of peer review programs are qualitative. As Bell (2002, p.8) notes, "it is difficult…to find quantitative evidence of the effectiveness of peer observation of teaching because of the nature and context of the practice."

A. Peer Partnerships in Teaching: Core Characteristics.

Drawing on the work of the successful peer review programs cited above, we developed and piloted a model in the School of Health Sciences in 2009-2010. Work by Kell and Annetts (2009) has suggested that the term "review" is perceived to be associated with a judgemental, summative, audit approach, and perceived to signal a lack of power by the observed. We wanted to avoid such connotations and so actively sought a name that would underscore the collegial and reciprocal nature of the program. We called our model *Peer Partnerships in Teaching*.

Peer Partnerships in Teaching (PPiT) has six core, defining features. First, participation is *voluntary*. Although critics might argue that those who volunteer for peer partnerships are the

ones least in need of support, our approach has been to work with those most engaged and use their energy, experiences and example to encourage those who might be more hesitant. Further, evidence suggests that mandatory approaches can lead to superficial engagement (McMahon et al., 2007).

The second feature of the model is that it is *cross-disciplinary*. Although many existing programs pair staff from within the same discipline area and anecdotal evidence suggests that staff often imagine that only those who teach similar content will be able to understand their particular experience, we have maintained a cross-disciplinary focus for two reasons. It encourages a focus on process and underlying pedagogy, rather than on the content of the class. Removing content-expertise, participants are forced to focus on the learning and teaching experience, examine the processes being used and question the underlying pedagogy. In addition, by pairing staff across disciplines, outside existing power relationships we also hoped to reduce perceived vulnerability and threat. Cross-disciplinary partnerships build collegial networks beyond one's discipline and can help provide supportive relationships outside the politics of one's everyday work group.

Third, the process is *reciprocal*, meaning that each PPiT member is both observer and observed in a partnership. Unlike other models that use expert reviewers (e.g, Bell, 2001) or approaches that encourage emerging academics to observe their more experienced colleagues (e.g., Hammersley-Fletcher & Orsmond, 2007), PPiT was designed to be a genuinely collegial exchange. Despite potential differences in teaching experience, confidence and age, each member of the program is regarded as having the potential to contribute meaningfully to the process. This is consistent with research suggesting participants in such programs learn as much from observing as from being observed (Bell & Mladenovic, 2008; Hammersley-Fletcher & Orsmond, 2004).

The fourth feature of the PPiT program is the embedded, mandatory nature of *training*. No staff member can engage in the program without attending training. The compulsory nature of training, which takes place in a two to three-hour workshop (depending on group size), ensures a shared understanding of the principles underpinning the program. Training also provides an opportunity to prepare staff for some of the more challenging aspects of the peer partnership experience including giving and receiving feedback. Previous research has noted staff reservations about receiving criticism (Hammersley-Fletcher & Orsmond, 2004) and anecdotal evidence suggested staff felt concerned about their own capacity to give effective feedback to a peer. As a result the PPiT training has a substantial, experiential component devoted to the process of giving and receiving feedback. The mandatory training is designed to instil confidence that all participants have appropriate skills for the program. Also incorporated into the training is the initial meeting between partners. Staff negotiate the focus for the partnership at this meeting.

The fifth characteristic of the formative approach to PPiT is the *individually determined focus* of the partnership. Based on their own needs and the expertise of their partner, staff may negotiate to focus on an element of their face-to-face teaching, aspects of online teaching, viewing podcasts, review of assessment and feedback processes, or observation of course and program guides. Participants are encouraged to negotiate their own focus, bearing in mind the particular features of their teaching that semester and the specific skills and experiences of their partner. Staff are encouraged to refine a focus that is specific rather than broad, so that partners can provide clear and meaningful feedback.

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The sixth and final feature of the model is *confidentiality*. Partnerships are established for the benefit of the two people involved and no formal reports have thus far been required for auditing or other purposes. Partners are encouraged to use the outcomes of their experience to support applications for promotion and teaching awards as evidence of their reflective practice, but are advised that the information obtained during the partnership is owned by the participant.

The characteristics of the model are consistent with the evidence-based recommendations developed by McMahon et al. (2007) that peer review participants have control over elements of the process, including participation, the focus of the observation, the resultant data-flow and next steps.

B. Peer Partnerships in Teaching: A 5-stage Model.

With these six characteristics as a framework, a five-stage model was developed (Figure 1). The model, using an action-research, reflective approach was based on the work of Maureen Bell (2005), who has been leading peer review of teaching at the University of Wollongong for more than 10 years. Stage One is the *Preparation* stage, which includes training. Pairing and briefing of partners takes place within this stage. Stage Two is where the *Observation* itself takes place. The third stage, *Feedback and Reflection*, includes the provision of both written and face-to-face feedback. A one-page PPiT template was developed to support the feedback process and help staff document change. We encourage all partnerships to engage in feedback over lunch and have provided a small financial reimbursement to underscore the importance of this stage in the process.
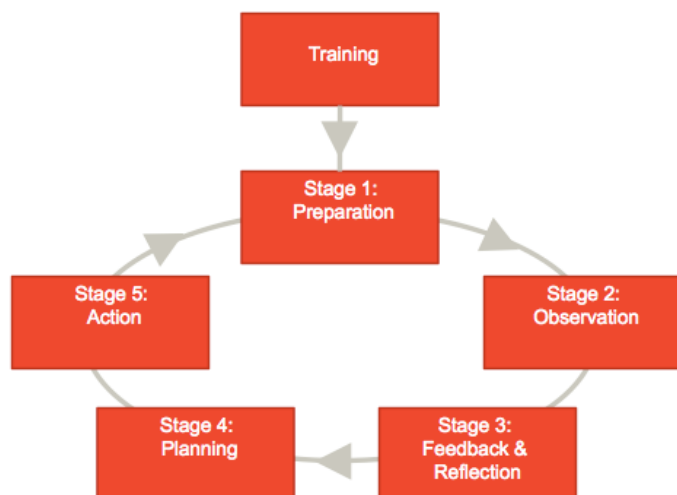
Figure 1. Five-stage peer partnership model.

The action research nature of peer partnerships is emphasised in many models of peer partnerships (Barnard et al., 2011). It is incorporated into the PPiT model in a fourth stage, *Planning*. Here the participant is encouraged to contemplate the changes to be made either within the current semester or subsequently and to make plans to enact those changes. The final stage, *Action*, emphasises the importance of behavioural change resulting from the partnerships and staff are invited to collect data on the effectiveness of the changes implemented.

The PPiT model has been highly successful in the School of Health Sciences, with more than half the permanent staff and a small number of sessional staff now trained and engaging in the process. Qualitative evaluation of the program and anecdotal data has suggested positive

outcomes consistent with the existing literature including the development of new skills and ideas, increased teaching self-efficacy and the development of collegial relationships across the school. On the strength of these outcomes a project was established to trial PPiT across the university. A reference group, set up to guide the development of the pilot, consisted of Deputy Heads, Learning and Teaching representing four schools, senior advisors in learning and teaching, and a staff member from the Graduate Certificate in Tertiary Teaching and Learning.

A survey of staff attitudes at the start of the year confirmed the perceived acceptability of a peer review program and the core features of the model. The only feature not confirmed was cross-disciplinary partnerships. Academic colleagues in the same discipline area were perceived to be more appropriate as review partners than either another academic outside the discipline area or an educational developer. Despite this preference prior to participation, the reference group decided to retain and evaluate the cross-disciplinary element given the strong rationale for it and the success of the model in the School of Health Sciences. PPiT was implemented in 5 schools representing the 3 Colleges of the university. Schools in both the Higher Education and Tertiary and Further Education (TAFE) sectors were included in the pilot.

C. Research Question.

The aim of PPiT was to engage academic staff in cross-disciplinary peer partnerships to enhance reflective practice about teaching and ultimately improve teaching quality. The aim of the current research was to evaluate the perceived effectiveness of PPiT during the pilot implementation phase with a view to refining the model for university-wide implementation. In particular the study aimed to evaluate PPiT with attention to the focus of PPiT chosen by participants, its perceived benefits, perceptions of workload and vulnerability and confidence in self and partner.

II. Method.

A. Participants.

Participants were 35 academic staff (19 females and 16 males) who volunteered for the pilot program. Of these, 30 were permanent staff and 5 sessional, 30 were from Higher Education and 5 were TAFE teachers. The five pilot schools (Health Sciences; Fashion and Design; Business TAFE; Global Studies, Social Science and Planning; and Computer Science and Information Technology) were selected for the program on the basis of two criteria: (i) positive attitudes towards participation identified in a university-wide staff survey and (ii) strong support from the Head of School. Due to the dual-sector nature of the university, schools representing both HE and TAFE were purposively included in the sample, as were schools with a high proportion of sessional staff. The study was advertised to staff in participating schools via email. Of the 35 staff who were trained in PPiT, 18 completed the PPiT evaluation survey and three staff participated in the focus group. In order to protect the confidentiality of the staff who responded to the evaluation survey and focus group, demographic details were not recorded.

B. Measures.

An evaluation survey (Appendix 1) was designed to gather quantitative feedback on the experience of engaging in PPiT. The survey included 16 questions covering the following

aspects of the program: the focus of PPiT; the perceived value of PPiT; the impact of PPiT on workload and perceptions of vulnerability; issues of trust and control; and questions about the use and usefulness of the training and template. A global evaluation of the program was assessed by the questions "I would recommend PPiT to colleagues" and "I would participate in PPiT again". Item responses included yes/no answers, and 5-point Likert scales. In addition, open-ended questions were included to gather information on changes made as a result of participating in PPiT, the best aspects of PPiT, areas for improvement and advice for staff contemplating participation in the program.

The focus group was designed to feedback the results of the survey to participants, triangulate the data and shape the model for university-wide implementation.

C. Procedure.

Participants undertook a compulsory two to three-hour training session. Training covered an introduction to the fundamental principles of peer partnerships and an overview of the 5-stage peer partnership model. Where possible training included the opportunity to meet with partners and discuss the focus for the staff involved. A chance to discuss concerns and issues was provided. After attending the training participants completed the first section of the PPiT template and forwarded this to their partner. The PPiT observations were completed within one semester and feedback provided within the partnerships. To emphasise the importance of meeting face-to-face for the final feedback session a small amount of money was provided to each pair for lunch. Sessional staff in one school were paid for the time they committed to the pilot. At the completion of the semester the online evaluation and face-to-face focus group were conducted. The research was approved by the University Human Research Ethics Committee.

III. Results.

The survey data were analysed in SPSS v.19. Due to the small sample size results presented here are largely descriptive. Where inferential statistics are included, non-parametric analyses were used.

A. Focus of PPiT.

The majority of survey respondents ($N = 15$) focused on an aspect of face-to-face teaching in their partnership. The remaining three participants examined an element of online teaching. Two participants focused on more than one aspect, including a review of the course guide, assessment and/or observation of online learning.

B. Perceived Benefits of PPiT.

All participants rating the experience of each as "quite useful" or "very useful". The mean score for usefulness of observing a partner was 4.5 (SD = 0.53) on a 5-point scale and for being observed, 4.6 (SD = 0.53). A Wilcoxon signed-rank test revealed no significant difference between these scores. The specific aspects of PPiT considered useful are summarised in Table 1.

Table 1. Perceived outcomes of PPiT participation

To what extent did participating in PPiT help you	Mean score (out of 5)	SD	Score range
Promote good teaching practice at the University	5.00	0.00	-
Reflect on your teaching	4.94	0.32	4-5
Increase your confidence in your teaching	4.80	0.41	4-5
Develop new strategies or skills	4.60	0.63	3-5
Enhance relationships with your academic colleagues	4.55	1.21	1-5
Increase your student feedback scores	2.53	1.50	1-5
Support an application for promotion	1.83	1.50	0-5
Support an application for a teaching award	1.56	1.19	0-5

There was a high level of agreement that PPiT provided a range of benefits for the individual, including an opportunity to reflect on teaching, increase teaching self-efficacy, develop new skills and build relationships with colleagues. At a broader level there was unanimous agreement that PPiT promoted good teaching within the University. In terms of the capacity of PPiT to improve student feedback there was a mixed response. Only two staff noted they had used PPiT in a promotion application and one had used it for a teaching award.

In response to an open-ended question about the aspects of teaching that participants had changed as a result of the partnership, participants noted changes to their teaching processes including changes to specific aspects such as chunking content, focus on time management within the class and skills to better engage students. Several participants, including those in the focus group, explicitly noted the impact of PPiT beyond the course focused on in the partnership. Staff observed a proactive approach to course review, with steps taken to redevelop courses for the following year. Broad changes were noted in teaching confidence.

Respondents were asked, in an open-ended question, to reflect on the best aspects of PPiT. Staff valued the core features of PPiT, including the opportunity to reflect and the chance to build collegiality across the school. As one participant commented, there was value in "meeting with other teachers and not feeling so isolated". The opportunity to share ideas and approaches and to do this by both inviting someone into one's space and observing a colleague was highly valued. As one participant noted, the best aspect of PPiT was to "share what is usually a very private space, and get feedback on how this compares with others' classrooms". Even staff who expressed a lack of trust in their partner's PPiT skills noted the value in "learning from observing another's classes" and "having the space to reflect and review". Focus group data strongly supported the value of observing others' teaching. Other specific comments related to the value of practising feedback skills, the structure of the PPiT template and the training.

C. Participant Workload and Vulnerability.

In terms of workload, PPiT was perceived to add minimal workload by 13 participants. A further 4 noted that it added "somewhat" to workload and one noted that it added "very much". The time commitment involved in PPiT was acknowledged by two participants who added that the extra workload was worth it. As one participant added, "try to take time to do this as the benefits outweigh the inconvenience of thinking of the time taken or other things you think you could be doing".

Participant vulnerability in response to PPiT was assessed on a 5-point scale, from "Not at all" to "Very much". Responses to this item, suggest two broad groups of participants: those who experienced little ($N = 5$) or no vulnerability ($N = 5$) and a smaller group who experienced some vulnerability ($N = 7$). It is of note that relatively few participants ($N = 2$) experienced high levels of vulnerability. Nevertheless vulnerability was a common occurrence. As one focus group participant noted, "Having peers sitting in your lectures can be quite nerve racking. But I felt it necessary to put myself out there to improve my teaching. This was important to me."

D. Confidence in Self and Partner.

When asked about their confidence in their partners' skills to engage in the PPiT process, the majority of participants ($N = 12$) answered positively, rating their partners' skills highly, however, 3 participants disclosed a complete lack of confidence (Figure 2). Confidence in one's own ability to provide effective feedback produced a different picture, with the largest group of participants ($N = 11$) indicating moderate confidence in their own ability.
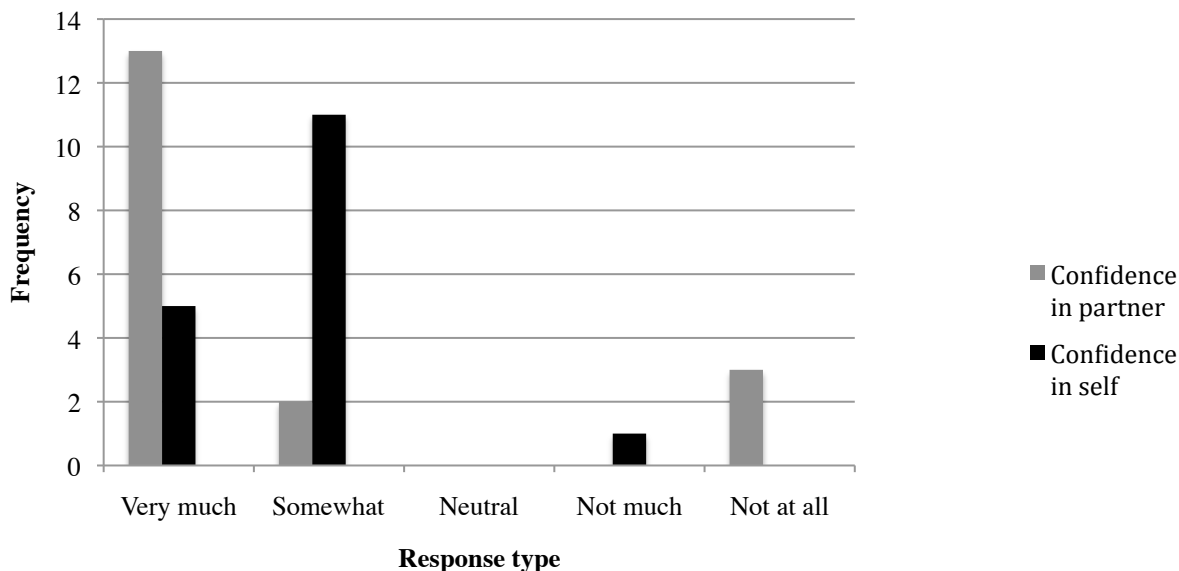
Figure 2. Confidence in self and partner's ability to provide useful PPiT feedback.

The mandatory training provided at the beginning of the program was evaluated positively with a mean rating on the 5-point usefulness dimension of 4.7 (SD = 0.48). The PPiT template used by all participants was also rated highly, with a mean score of 4.5 (SD = 0.53).

In order to explore relationships between variables a correlation matrix was constructed. The strongest significant relationships were noted between confidence in one's own reviewing skills and using PPiT to reflect on teaching ($r = .91$). Relationships were noted between the use of PPiT to develop new skills and confidence both in one's own reviewing skills ($r = .64$) and those of one's partner ($r = .52$). Confidence in one's own ability and one's partner's ability to engage in useful reviews were correlated ($r = .58$). A correlation was also noted between using PPiT to develop new skills and using it to reflect on teaching ($r = .70$). A moderate positive relationship was noted between vulnerability experienced in PPiT and using PPiT to enhance relationships with colleagues ($r = .56$). Finally, significant relationships were noted between

using PPiT to support an application for promotion and to support a teaching award ($r = .80$) as well as to improve student feedback ($r = .49$).

Staff provided a small number of suggestions for improvements to PPiT, including the value of starting early in the semester to allow maximum time for exchange. Included in these comments was an interest in undertaking more than one observation-feedback-reflection cycle with a partner in a semester. Another participant expressed an interest in choosing a new partner each semester to continue to build skills.

In response to the global evaluations of the value of PPiT, all respondents strongly agreed that they would recommend PPiT to colleagues and engage in PPiT again in the future. This feedback was endorsed in the focus group.

When asked to provide some advice for participants contemplating PPiT, survey respondents were universally enthusiastic. This was echoed in comments such as "Do it. Especially if you are doing something new and need feedback", and "Just do it… it's one of the best methods to reflect and improve on your teaching", and "It's 100% worth it". Survey respondents and focus group participants acknowledged the hesitations that staff may bring to the process and provided advice to get the most out of PPiT, including "embrace the process", "participate openly", "focus on an area of your teaching you are really interested in", "do it properly", "start as soon as you can", and "be ready to be challenged".

IV. Discussion.

This research adds to the existing literature supporting the value of peer review by examining the impact of a voluntary PPiT program. The pilot PPiT program, implemented in five schools, was evaluated positively. Perhaps the strongest endorsement for the program was the unanimous intention of participants to engage in PPiT in the future and recommend it to colleagues.

A. Formative and Summative Benefits of PPiT.

A more detailed analysis of the results suggested two groups of benefits. First were those benefits integral to the formative model – focus on reflection, development of new skills and collegial support. Congruent with previous studies, these benefits were valued highly and consistently by participants. Not surprisingly the use of PPiT to reflect on teaching and develop new skills were related, underscoring the relationship implicit in peer review programs between pedagogy and practice. In addition, development of new skills was correlated with perceived confidence in one's partner's skills. Although partners were typically rated highly, some were not. These results reinforce the value of the mandatory training program, suggesting that building peer review skills is a valuable investment, with impact on the potential for the program to lead to skill development. It is of note, however, that confidence in one's partner's observation skills was not related to perceived usefulness of the program and did not impact on willingness to engage in the program in the future. It would appear therefore that reciprocal programs provide staff with benefits beyond receiving direct feedback and are not wholly dependent on the perceived characteristics of one's partner.

The PPiT program emphasises collegiality, pairing staff across disciplines and sectors (HE and TAFE), sometimes with partners who are not known to them. A staff survey administered to academics prior to implementation of the pilot revealed a preference for partners from the same discipline. This preference was also raised by participants in some training

sessions. The benefit of the cross-disciplinary model was explained and in all sessions staff agreed to trial it. One participant noted that this did not meet her needs and dropped out of the program. Despite some initial reservations the cross-disciplinary feature of PPiT was not criticised by participants in their evaluation, although it is possible that their evaluations of partners' PPiT skills may reflect perceptions of disciplinary difference. A more refined evaluation of this particular feature of the model, including the advantages and concerns associated with working in a cross-disciplinary way, is planned in the future.

In terms of the collegial nature of PPiT, perceptions of relationship development and vulnerability were positively correlated, suggesting perhaps that those who acknowledge vulnerability experience the greatest gains in collegial relationship development. Far from being a weakness of peer review programs, vulnerability may therefore be a valuable experience if staff can be encouraged to acknowledge these feelings as a normal part of the peer review process.

The second group of benefits were those characteristics typically associated with summative models. These included using the experience to support applications for promotion and teaching awards. These benefits were not considered applicable for the majority of participants, which may simply indicate that few participants were planning to apply for either promotion or a teaching award in the coming year. However, it is also important to note that PPiT was not embedded in promotion and award criteria, so even staff applying may not have been clear whether or how to use their PPiT experience as evidence. Building PPiT into existing structures within the university, including CPD, promotion criteria and workplanning is an important future task.

In comparing these two groups of benefits it appears that staff are more motivated to engage in PPiT for formative rather than summative rewards. This may explain the perceived lack of impact of PPiT on student feedback scores. Within a context in which student feedback is highly valued by universities, it is interesting that staff did not perceive PPiT to impact on this aspect. It may be that staff see student evaluations conducted by the university as a summative aspect of PPiT or it could be that the changes to teaching as a result of PPiT are generally not implemented in that semester, so impact on the current cohort of students was perceived to be minimal. Further research is warranted into the specific impact of peer review programs on teaching practice and the influence of such programs on student engagement.

Despite the perceived acceptability of peer review of course materials and assessment tasks (Barnard et al., 2011) and an emphasis in the training that moved beyond the traditional focus on face-to-face observation, it is of note that the majority of staff in the current evaluation chose an element of their face-to-face teaching for their peer partnership. Anecdotal evidence suggested a clear preference for face-to-face observation, with other alternatives typically chosen only if partners could not attend class, due, for example, to a timetable clash. This focus may reflect the lack of feedback staff typically receive on their face-to-face teaching. In contrast course and assessment materials is often reviewed in teaching teams. In addition, the preference may indicate the value staff place on the face-to-face interactions they have with their students and their desire to maximize potential here. In the School of Health Sciences, we have noted that this focus on face-to-face observation has continued over time, however, as staff have received feedback on their classroom teaching some experimentation has increased, with focus on other aspects of teaching.

B. Limitations of the Pilot Study.

The results of this evaluation should be read in light of the limitations of the study. In common with several other evaluations of peer review programs, this study was characterised by a low sample size. In addition, the survey was completed by slightly more than half the 35 staff who trained in PPiT. The positive attitudes reported here are consistent with most other research in this area, however, it is possible that those staff who did not complete the survey had different perspectives of the program. Finding ways to engage these staff in future evaluations will be important. Embedding leadership for the program within the school may lead to enhanced participation in the evaluation process.

C. Future Directions.

Results of the survey and focus group evaluation of a voluntary peer review program add to a consistent picture that supports the value of such programs for participants, underscoring their potential to provide sustainable professional development. The results presented here suggest the program was highly regarded, with impact on pedagogy and skill as well as on the enhancement of supportive, collegial relationships. The next key step in the development of the program will be to develop a sustainable model, locating leadership for the program in communities of practice within schools. In order to be successfully implemented in the long term, PPiT needs to be embedded into university structures, including the workplan process, where the time commitment (estimated to be 10-12 hours) can be appropriately acknowledged. Integrating PPiT as a form of evidence in the promotion and teaching award criteria is also likely to be important. Work already done in the area includes the peer review handbook developed by Harris, Farrell, Bell, Devlin, & James (2008) and the report by Crisp et al. (2009) on implementing peer review for promotion purposes.

Core decisions for the future will surround the voluntary nature of the program and questions around the control of information produced by the partners (McMahon et al. 2007). It is of note that the pilot described here had support from Heads of School, who provided funding for the debriefing lunch and support for sessional staff to engage in the program. The ongoing success of the voluntary program will be dependent on strong support from the university and will rely on ongoing local level support, through embedded leadership. In this way, peer review programs can provide sustainable CPD in ways that build collegial relationships and enhance educational capital.

Acknowledgements

Appendix

Appendix 1. Peer Partnerships in Teaching Evaluation.
We are interested to hear about your experiences of Peer Partnerships in Teaching (PPiT) last semester. There are many different forms that PPiT can take and some of the following statements may not apply to you

1. Thinking back over your experiences of PPiT last semester, how useful did you find it to have a peer observe the following aspects of your teaching:

	Not at all useful	Not very useful	Neutral	Quite useful	Very useful	Does not apply
Face-to-face teaching	1	2	3	4	5	N/A
Online teaching material	1	2	3	4	5	N/A
Podcasts	1	2	3	4	5	N/A
Course or program guide	1	2	3	4	5	N/A
Assessment and feedback processes	1	2	3	4	5	N/A

	Not at all useful	Not very useful	Neutral	Quite useful	Very useful
2. How useful did you find it to observe your partner?	1	2	3	4	5

3. To what extent did engaging in PPiT help you in the following areas:

	Not at all	Not much	Neutral	Somewhat	Very much	Does not apply
Reflect on your teaching	1	2	3	4	5	
Increase confidence in your teaching	1	2	3	4	5	
Develop new strategies or skills	1	2	3	4	5	
Enhance relationships with your academic colleagues	1	2	3	4	5	
Promote good teaching practice at the university	1	2	3	4	5	
Increase your student feedback scores	1	2	3	4	5	N/A
Support an application for promotion	1	2	3	4	5	N/A
Support an application for a teaching award	1	2	3	4	5	N/A

	Not at all	Not much	Neutral	Somewhat	Very much
4. How useful did you find the training provided?	1	2	3	4	5
5. How useful did you find the PPiT template provided?	1	2	3	4	5

	Not at all	Not much	Neutral	Somewhat	Very much
6. To what extent did engaging in PPiT add to your workload?	1	2	3	4	5
7. To what extent did engaging in PPiT make you feel vulnerable?	1	2	3	4	5

	Not at all	Not much	Neutral	Somewhat	Very much
8. To what extent did you feel that you set the agenda for your own review?	1	2	3	4	5

9. How challenging did you find it to

	Not at all	Not much	Neutral	Somewhat	Very much
Trust your peer's reviewing skills	1	2	3	4	5
Trust your own reviewing skills	1	2	3	4	5

10. What were the best aspects of the PPiT process for you?
11. What aspects of the PPiT process do you think could be improved and how? (For example: the training, potential use of templates, pair selection process, feedback session, etc.)
12. What changes have you already made as a result of engaging in PPiT?
13. What changes do you plan to make as a result of engaging in PPiT?
14. What advice would you give to someone about to undertake PPiT?

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
15. I would recommend PPiT to colleagues	1	2	3	4	5
16. I would participate in PPiT again	Yes	No	Not sure		

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Co-teaching a dual content-area methods class: Considering context for evaluating collaborative intensity

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Abstract: Mathematics and science are often combined in early childhood education programs into a single methods course. This can lead to an integrated view of the two, thus neglecting their conceptual, procedural, and epistemological differences. To promote their foundational integrities, we, one mathematics and one science educator, collaborated on teaching an amalgamated course. Our impetus was the need to develop mutual ability to instruct the course independently. In this paper, we reflect on and discuss the context of our collaboration, from which emerged a conceptualization of co-teaching that emphasizes the importance of context for motivating and understanding its nature.

Keywords: reflective practice, co-teaching, collaboration, higher education, teacher education.

There are many reasons college level co-teaching has been implemented. Broadly, it has been used to improve student outcomes (Dugan & Letterman, 2008), promote professional development between and among faculty (Duchardt, Marlow, Inman, Christensen, & Reves, 1999), and model mentorship and collaboration in the classroom (Kluth & Straut, 2003). Within our field of teacher education, co-teaching has addressed circumstances of interdisciplinary programmatic collaboration for courses such as early childhood special education (Hestenes et al., 2009), and it has been recommended for integrated methods classes that prepare preservice elementary teachers for the challenges of being effective generalists in the classroom (Zhou, Kim, & Kerekes, 2011).

Regardless of the impetus, the broader body of literature on co-teaching suggests its potential to enhance the teaching and learning experience for everyone involved (Brody, 1994; Crow & Smith, 2005). Expanding available literature that helps stakeholders establish expectations and prepare for the experience can encourage college faculty to engage in collaborative activity and administrators to support it. For example, Perry and Stewart (2005) have offered a continuum depicting degrees of collaborative engagement between and among faculty across co-teaching scenarios. However, modeling a general degree of intensity throughout a co-teaching commitment is challenging because it is the particular context of a collaboration that determines the intensity of its participants' involvement. Here, we define collaborative intensity as the intellectual energy, diligence, and time participants invest in the process, and by context we refer to the relevant set of circumstances associated with the collaboration.

In this reflective essay, we share our experiences with co-teaching a combined mathematics and science methods course for early childhood preservice teachers. To capture this undertaking, we took detailed anecdotal records of our preparations for, and teaching of, the

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course. We used these records to reflect on and characterize the varying nature of our collaborative efforts throughout the process. Thus, by sharing our story we aim to contribute to the available scholarship related to co-teaching and the importance of considering context when preparing for and implementing it. We begin by introducing our context and then go on to describe general phases of collaboration we identified throughout. We consistently reflect on the levels of collaborative intensity as they relate to the aforementioned phases, and finally we conclude with what we learned from the process.

I. Context.

Historically, mathematics and science, as content area disciplines, are often paired because of their inherent relationship (American Association for the Advancement of Science, 1993). For example, some of the mathematical strands discussed in the *Principals and Standards for School Mathematics* (National Council of Teachers of Mathematics [NCTM], 2000), such as measurement and communication, correspond to scientific process skills that are addressed in the *National Science Education Standards* (National Research Council [NRC], 1996). More recent reform documents such as the *Common Core State Standards Mathematics* (CCSSM) (National Governors Association [NGA], 2010) and *A Framework for K-12 Science Education: Practices Crosscutting Concepts and Core Ideas* (NRC, 2012) maintain the connections in their recommendations and statements.

The mathematics/science connection is also reflected within some early childhood teacher education programs where there is a single course addressing methods of mathematics and science instruction, with many of the available text book options for these courses also addressing both content areas (e.g., Charlesworth & Lind, 2007; Davis & Keller, 2009; Prairie, 2005). In our own teacher education program, we have such a combined early childhood mathematics and science methods course, and traditionally, a single faculty member with expertise in one or the other discipline is assigned to teach it.

Prior to our collaboration we had each been assigned to teach the combined course individually without what we felt to be adequate knowledge of science education in one case and mathematics education in the other. Thus, supported by Boyer's (1990) assertion that "[t]hose who teach must, above all, be well informed, and steeped in the knowledge of their field" (p. 23), we proposed to our administration that we co-teach the course in order to improve our understanding of the content and pedagogy in our respective deficit subject-areas and thus be better prepared to teach the course as individuals. We explained that an inherent relationship between mathematics and science does not necessarily mean a mathematics educator will be proficient in science education, and vice versa. We further clarified that our goal was to emerge from our collaboration more confident and capable of teaching the course as individuals rather than for each of us to teach half the course as it related to our fields of study. That is, we wanted to learn about teaching and learning in the discipline not our own so that we could take on the course independently from a more informed, skilled perspective.

Our collaboration plan involved all aspects of the course ranging from developing the syllabus, selecting course readings, determining and grading assignments, to instructing the course. Although our request was approved, resources were not available to extend the opportunity beyond a single quarter. Thus, it was important that we learn as much as possible about teaching and learning in one another's discipline within this limited time frame.

II. Phases of Collaboration.

A. *Stage 1: Course Conceptualization.*

The combined early childhood mathematics and science methods course at our institution is taught at both the graduate and undergraduate levels. At the graduate level the course meets for three hours weekly throughout an 11-week quarter. In addition to weekly class meetings, the course requires 15 field experience hours in an early childhood setting equally divided between mathematics and science teaching. Likewise, the undergraduate version of the course has weekly three-hour sessions and requires 20 field experience hours. Both course descriptions emphasize an exploration of theoretical principles, materials, methods, and activities for teaching mathematics and science in preschool and primary grades.

In the past, the course has been structured according to the scope and sequence outlined in a relevant textbook. Course material has been either primarily integrated or else weighted in terms of instructors privileging one subject area over the other. Thus, our first collaborative task was to review relevant literature and then consider whether or not we wanted to use an integrated focus for the course, or if we wanted to separate out the subjects now that we had content-area and pedagogical experts for each. One widespread argument we found for integrating mathematics and science focused upon the relevance of learning mathematics within the context of science in order to avoid students accumulating isolated facts and procedures (Meier, Nicol, & Cobbs, 1998). Another compelling position related to specifically integrating methods classes in order to better prepare preservice elementary teachers for their future "generalist" positions in the classroom, where they will be responsible for covering the curriculum for myriad subject areas (Zhou, Kim, & Kerekes, 2011). A more pragmatic thesis was that integrating the two subjects is a more efficient and effective use of instructional time (Stinson, Harkness, Meyer, & Stallworth, 2009).

However, there were also significant arguments opposing the integration of mathematics and science in the classroom. For example, an integrated view of mathematics and science does not acknowledge their conceptual, procedural, and epistemological differences as subject areas (Lederman & Niess, 1997), and thus may not prepare preservice teachers for the specific content-area demands of instruction. Preservice teachers already receive limited exposure to what they are expected to teach and how they are supposed to teach it (Ball, Sleep, Boerst & Bass, 2009). At our institution, liberal studies and early childhood certification requirements include candidates taking two scientific inquiry courses and the course *Quantitative Reasoning and Technological Literacy*, which satisfies the only mathematics-related requirement. Furthermore, those who take dual-content methods courses and are not afforded the time for an entire course of study in either area, do not have the opportunity to develop adequate content knowledge and related instructional skills within each discipline. Such epistemologically differentiated understandings are necessary for pre-service teachers so they may offer their future students the requisite subject-specific foundational knowledge that leads to meaningful applications (Lederman & Niess, 1997).

Potentially, one way to potentially differentiate mathematics and science within the constraints of a single methods course is to organize content around "big ideas" (Bransford, Brown, & Cocking, 1999). Indeed, organizing one's thinking around big, or unifying ideas as opposed to emphasizing isolated facts or prescribed information is a hallmark of how experts operate in their respective fields. Integrating mathematics and science methods conflicts with this

notion because the broader themes across the content areas are in fact different. For example, number sense is a "big idea" discussed extensively as a unifying theme throughout the *Principles and Standards for School Mathematics* (NCTM, 2000) and the new CCSSM (NGA, 2010). Yet, it is not found in the *National Science Education Standards* (NRC, 1996), or in *A Framework for K-12 Science Education: Practices Crosscutting Concepts and Core Ideas* (NRC, 2012). Thus, an integrated approach to a mathematics and science methods course may further limit early childhood and elementary teachers' opportunities to develop mathematical and scientific content knowledge that is so critical to effective pedagogy. (Appleton & Kindt, 1999; Ball, Sleep, Boerst & Bass, 2009; Harlen & Holroyd, 1997; Lederman & Niess, 1997).

Thus, the ultimate conceptualization of the course centered upon what we each considered to be the central, or unifying, "big ideas" underpinning teaching and learning in each of mathematics and science (Bransford, Brown, & Cocking, 1999). However, because of the limitations of time within an 11-week quarter and our commitment to differentiating the epistemological underpinnings of mathematics and science, we agreed to focus on one central unifying conceptual theme for each discipline. For mathematics this theme was number sense and for science it was inquiry. We individually selected one theme before discussing how we would elaborate on it within the four class sessions specifically allotted to each content area. That is, we planned to have a general introductory class session during which we would review the syllabus, course requirements, and other relevant logistics. This would be followed by four class sessions related to mathematics education, one class session to transition to science education, four class sessions dedicated to science education, and finally a concluding class session.

We characterized the collaborative intensity of this course conceptualization stage as moderate. This is because we selected each theme individually and were each accountable for sharing and justifying our choices. However, the initial discussions about the approach to take in the course required us to review literature on the impact of learning both content and pedagogy from an integrated versus differentiated perspective. These literature reviews and consideration of their findings were moderately intense because although we could do much of the reading individually, we did need to come together to share our thoughts and to deliberate and discuss them.

B. Stage 2: Initial Co-Planning.

Next, we began planning the class and developing a syllabus, reading agenda, and course of study. We began addressing our reading agenda by reviewing available and recommended textbooks. In reviewing them, one possible option included the use of both a mathematics and science methods text relevant for prospective early childhood educators. However, the books we considered for this option were costly and covered too many topics in too little depth relative to our time frame. Another option was to choose a textbook that combines the pedagogies of early childhood mathematics and science. Upon review, we felt these sorts of texts undermined our intentions of clearly defining the central themes we had identified in our initial conceptualization of the course. Thus we decided not to use an existing textbook, but rather to compile a selection of seminal and relevant readings that would offer teacher candidates concrete instructional ideas with strong theoretical bases while encompassing the aforementioned "big ideas."

Finally, we had to develop and agree upon course assignments that would provide us with insight into students' conceptualization and application of each content area's "big idea" and

their pedagogical implications. This entailed reflecting on those mathematics and science education assignments we already used in our respective single-subject methods coursework and on their appropriateness for a dual-content course. This review led to the reformulation of certain assignments aimed at students communicating their theoretical and pedagogical content knowledge. Ultimately, revised assignments included reading response papers and lesson plans. We also designed a new assignment for which we asked students to identify and analyze the mathematical and scientific connections young children make both in and out of school.

The collaboration involved in this co-planning was highly intensive because of the dual nature of the course content. That is, while planning the course we were also beginning to develop pedagogical and content knowledge of one another's discipline. For example, the science educator not only had to plan for an early childhood methods course around inquiry but also needed to learn about and plan around number sense in mathematics. The same held true for the mathematics educator. Further, deciding on our reading agenda not only involved reviewing the texts and deciding on a compilation of readings but also reading and discussing one another's selections for their readability, content, length, and relevance to course goals. Likewise, determining course assignments involved a similar review and discussion of one another's individual syllabi.

C. Stage 3: Individual Instruction.

Subsequent to the co-planning stage, the mathematics educator solely instructed the undergraduate version of the course during the fall quarter because our collaboration had only been approved for the winter quarter graduate sections. Although she taught the course individually, we maintained a moderate level of collaboration. We continued to meet weekly to organize the content and instruction of each individual class session and to discuss the implications and applications of the week's reading. These meetings were significantly shorter than those for the initial co-planning stage and our time together varied depending on the content area focus of the upcoming class.

To illustrate, for an upcoming class session devoted to mathematics teaching, the mathematics educator shared the activity that she would typically do for that week's instructional focus, such as playing board games for developing number sense. We discussed the activity relative to the weekly readings and the "big idea" represented therein. This allowed the science educator to offer ideas for engaging learners as well as to ask questions pertaining to instruction. Likewise, when meeting to prepare for a class such as one devoted to teaching physical science through inquiry-based practices, the science educator shared the activity he would typically implement in his own science methods courses, which is having students complete a circuit involving batteries, bulbs, and wires to provide an experiential context for discussing inquiry and physical science content. Drawing from what the mathematics educator learned from the week's readings, she participated in this activity in preparation for implementing it in the forthcoming class and discussed its significance as a "big idea" in science education. Furthermore, she had the opportunity to offer feedback on its conceptual and procedural accessibility to new learners.

D. Stage 4: Co-Planning Revisions.

After the mathematics educator taught the course and students completed their course evaluations we went into a period of highly intense collaboration in order to revise the course

and prepare to co-teach it the following quarter. This stage was condensed relative to the initial co-planning because of the limited amount of time between academic quarters. It was highly intensive because we had to return to the broader conceptualization of the course, and examine readings, assignments, and class session content in the context of the learning goals we established during our initial co-planning and the students' feedback. Further, we had to consider the knowledge we had each developed in one another's discipline in order to ensure the revised course plan effectively facilitated our inevitable return to instructing the course as individuals.

As mentioned above, during the initial co-planning of the course we spent significant time selecting seminal and appropriate readings that were comprehensive enough to communicate those "big ideas" essential to early childhood mathematics and science. Students' feedback about the readings through associated assignments and in-class discussions, as well as the mathematics educator's experiences with grading students' work and facilitating discussions, necessitated revisions with respect to course readings. For example, the seventh week of the course introduced inquiry learning and the emergence of alternative conceptions in science education. We intended the readings for that week to address alternative conceptions through inquiry learning. However, it turned out that although the description of alternative conceptions was clear their relationship to inquiry learning was not. To illustrate, in the primary article we assigned, Sewell (2002) situated her discussion of alternative conceptions within constructivist theory rather than through its explicit application of scientific inquiry. Thus, this iteration of the course did not adequately provide the students with an opportunity to fully appreciate the significance of inquiry learning as best practice for addressing alternative conceptions. Consequently, we decided to restructure the reading list to include additional articles (Blake, 2009; Palmeri, Cole, DeLisle, Erickson, & Janes, 2008) specific to the role of inquiry learning in science education.

E. Stage 5: Co-Teaching.

The next phase of collaboration took place the following quarter when we co-taught the course. Although we met briefly each week before class to do routine preparations such as review the day's agenda, discuss student progress, and prepare materials, we characterized these collaborative efforts as minimal compared to the preceding planning stages. Furthermore, while we met periodically throughout the quarter to grade student work, the time spent on determining course assessments in the two earlier planning stages was thorough enough to expedite this.

With respect to the actual instruction, because half the course was dedicated to early childhood mathematics instruction and the other half to science, each of us acted as lead teacher for certain portions of those class sessions devoted to our respective areas of expertise. The lead teacher was in charge of such things as introducing activities and facilitating discussions about the week's readings, yet we each actively participated in these experiences and discourse. This format allowed us to rely upon one another's respective content area expertise and to act as not only instructors but also as students noting the features, nuances, and patterns experts readily recognize in their disciplines (deGroot, 1965).

For instance, during one class session the science educator introduced the role of sustained inquiry experiences where students investigate questions over time and within differing contexts. Here the mathematics educator noted the role of posing investigative questions that students could answer through their own observations and evidence without necessarily asking explanatory questions pertaining to why something happened. When exploring the properties of

magnets, learners observed that magnets attracted only certain materials and compared and contrasted those observations with predicted outcomes and prior experiences with magnets. Students then generalized their observations to communicate that for instance, magnets do not attract all metal objects as may have been originally supposed. Accordingly, the goal of the activity was not to understand *why* magnets attract certain materials, simply that they do. In mathematics education, learners are also expected to solve problems and answer questions using processes such as inquiry, observation, and exploration. However, working toward understanding and communicating why procedures and algorithms work is also critical. Teachers and students strive to respond clearly to questions pertaining to the conceptual bases for learned procedures so that students better understand the history, application, and utility of doing mathematics. Thus, our individual observational roles centered on comparing and contrasting the principles and practices of our respective disciplines with our developing understanding of how to teach in the other's content area.

When it came to the more general, content neutral aspects of each class session such as discussing field experiences and assignments, there was more seamless leadership between us. Our intent was to establish ourselves as the co-instructors of the overall course as opposed to individual content area instructors responsible for only half the course material. This encouraged each of us to reflect upon both the mathematics and science components of the course for general revisions in preparation for future individual instruction.

F. Stage 6: Reflection.

In the final stage of our process we returned to a high level of collaborative intensity as we reflected upon and prepared to teach the course independently in the following academic year. Generally we revisited our overall co-teaching process beginning with the course conceptualization through co-teaching. We also reviewed students' course evaluations for suggestions or predominant themes that would offer additional areas for revision. Evaluations communicated that for the most part students were pleased with the structure and conceptualization course, but some still "[wished] there were more time to spend on each subject."

We considered this reflection stage to be highly intensive because of its focus on what we learned conceptually and instructionally about the "big idea" in one another's discipline. To ensure that each of us was adequately prepared to independently teach the course in the fall, we first took the opportunity to work through any apprehensions we still had about teaching in one another's content areas. For example, when the mathematics educator reflected upon the underlying theme of inquiry across the science education portion of the course, she first considered how it was experientially illustrated in a physical science activity involving circuitry. Specifically, she had to think about how she would recreate the activity while facilitating a discussion about the role of inquiry as a "big idea" in early childhood science education. As part of this reflection, she engaged the science educator in the aforementioned activity and discussion, all the while soliciting feedback. A comparable process was used for number sense in mathematics.

We also felt it was necessary to revisit select pieces of students' work in order to ensure we could confidently and competently assess it independently in both subject areas. For instance, in reviewing one student's mathematics lesson plan we were able to discuss and assess the implications of her procedural over conceptual emphasis and establish how to communicate that

with concrete examples and suggestions for change. Likewise, when reviewing a student's science lesson plan, we identified the organizing framework as one of validation and not inquiry-based science. That is, the pre-service teacher had students confirming what they had already been told would happen as opposed to allowing them to fully explore the outcome and the science therein. This process not only allowed us to develop proficiency with assessment in one another's discipline but also helped formulate changes and revisions to course material.

III. Summary Discussion.

Our collaboration consisted of six discrete phases and three levels of intensity – minimal, moderate, and high. We began with conceptualizing the overall course with a moderate amount of collaborative effort. Then we progressed to our initial co-planning stage, which we characterized as highly intensive. In the next stage the mathematics educator individually taught the course with moderate collaborative input from the science educator. Next we returned to a high level of collaboration as we co-planned revisions in preparation for co-teaching. Then we co-taught the course at a low level of collaborative intensity before finishing with a high level of collaboration as we reflected on our experiences and prepared to teach the course as individuals. See Figure 1 for a representation of the six phases and their respective levels of intensity.

The genesis of this process emerged from our initial purpose: We each needed to learn how to teach early childhood methods in one another's content area in order to ultimately teach the course independently. Having completed our initiative, we both feel sufficiently prepared to teach the course in its entirety. We attribute this preparation to significant learning opportunities the context of our collaboration afforded us. First, becoming familiar with and eventually conceptualizing the course around "big ideas" had a tremendous impact on our learning. When the science educator structured the course on his own and prior to any collaboration with the mathematics educator he organized the mathematics portion of the course according to individual topic areas found in a textbook. He can now see that in doing so, he did not establish number sense as an infrastructure of early childhood mathematics and how it would connect individual topics such as measurement, geometry, number and operations (NCTM, 2000). Likewise, the mathematics educator expected to organize the science education aspect of the course around the different science content areas: Life; Physical; and Earth and Space Science. This contrasts with emphasizing the teaching of science through inquiry and using that as a common thread that underlies the instruction of any scientific area of study.

Our co-teaching goal was to develop confidence and expertise in each other's disciplines. Our aim for this paper was to inform others' plans for co-teaching by sharing our experiences, communicating the details of our practice and the varying intensity of it, and modeling the reflection process. We found, for instance, that our actual co-teaching phase was the least intense period of our collaboration. This is in contrast to Perry and Stewart's (2005) continuum, along which co-teaching involves highly collaborative work. Furthermore, it is likely that our work together would have looked very different if we were to co-teach this course indefinitely because the need to become competent in one another's disciplines would not have been necessary to the same extent. Thus, characterizations of co-teaching must account for particular contexts motivating the partnership and inspire the sort of reflective practices that Boyer (1990) referred to as a scholarship of teaching.
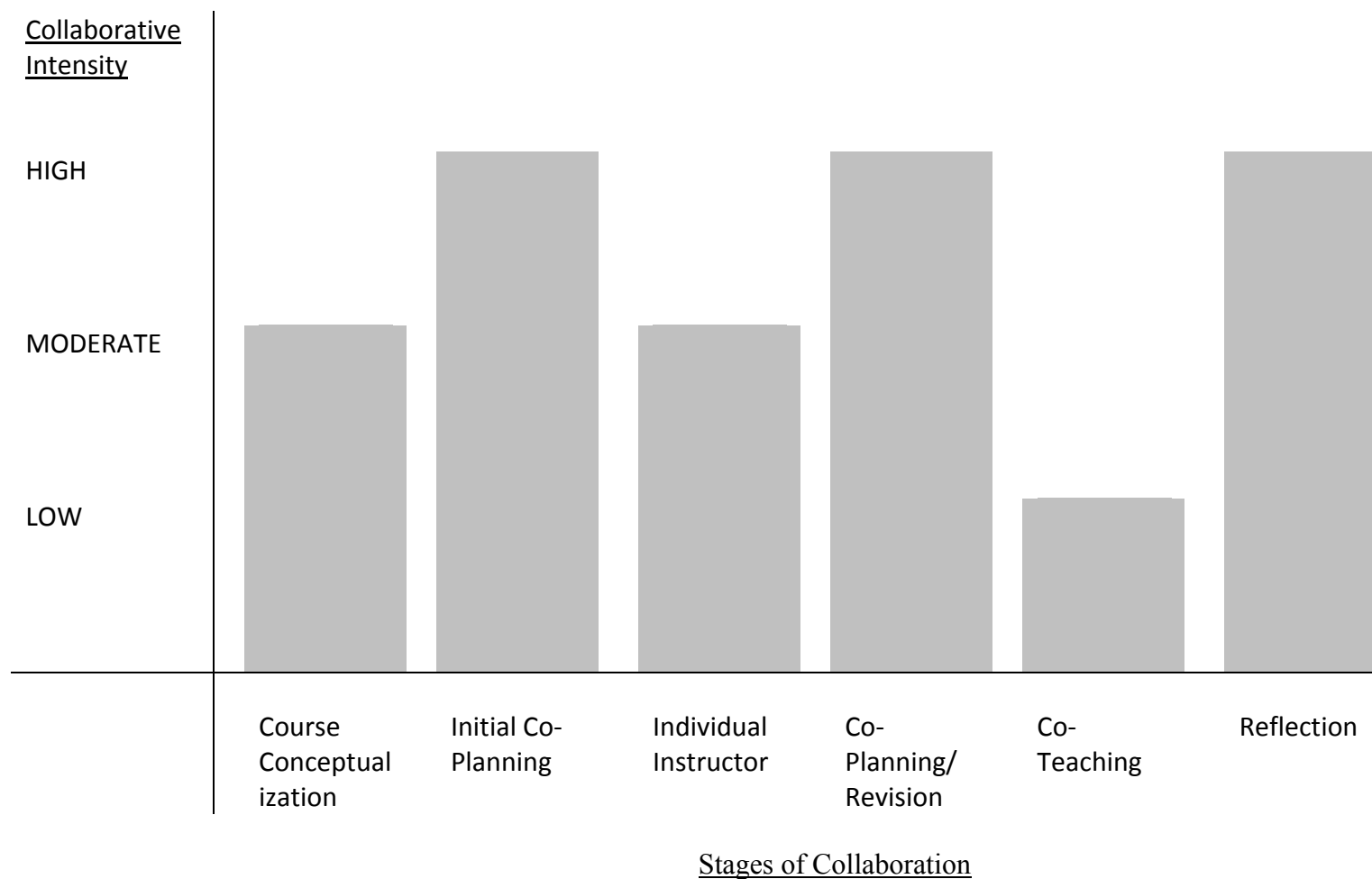
Figure 1. Stages of Collaboration and Their Respective Degrees of Intensity.

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Book Review

Facilitating Group Learning: Strategies for Success with Diverse Adult Learners

Robert M. Wolter[1]

Citation: Lakey, G. (2010). *Facilitating Group learning: Strategies for Success with Diverse Adult Learners*. San Francisco, CA: Jossey-Bass. ISBN: 978-0-470-76863-1

Publisher Description: This book defines principles and techniques for teaching adults in groups and includes illustrative stories from the experiences of the author. It deals with issues of diversity, as well as authenticity and emotions in group learning. This book describes how to design effective learning experiences, and how to facilitate these learning experiences, and brings all the elements of the author's approach together. It also includes material on sustaining the educator, working with social movements, and an effective toolkit. This book is resource for facilitators of adults in group learning situations. Jossey – Bass http://www.josseybass.com/WileyCDA/WileyTitle/productCd-0470768630.html

An adult educator who has consulted with labor unions and adult education programs to develop gender sensitive leadership training and other anti-oppression work, Lakey quickly engages the reader with tales of his teaching/learning/facilitating experiences with adult learners. His accounts stress the need for authenticity and emotion in the learning process if the learner is to come away from the experience with anything meaningful. The narrative stories accompanying the chapters allow the reader to explore the complexity of teaching and how that complexity can develop into discovery. Loosely framed around Tuckman's stages of group development with a nod to Mezirow's transformational leadership, the text begins by explaining the motivation of groups and individuals followed by highlighting internal group differences, after which the author explores the design and facilitation of group learning.

Chapter 1 begins with Lakey introducing the concept of direct education and explaining how it can be used to focus the encounter of teacher and group. An experiential approach, direct education methods stimulate learners into spontaneous responses focused on kinesthetic and emotional learning channels. In *Part I: The Learning Group and the Individual*, Lakey offers the reader a useful way to understand the relationship between the learning group and the individual while generating synergy. Chapter 2 begins by advising facilitators to consider the group environment as a container and to build it strong enough to hold conflicts without suppressing participants with ground rules. Stressing that a "safe container" is necessary if participants are to explore their power and do their best work, the author advises that positive reinforcement is a necessary approach to the successful implementation of direct education. He also reveals that teachers have a mandate to be proactive during the container building process.

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Chapter 3 stresses that facilitator expectations influence the learner's attitudes toward themselves and goes on to point out that participants should be deeply challenged to take responsibility for their learning because they cannot become powerful learners while coasting on objectives set out in the curriculum. In Chapter 4 the reader begins to understand that even though much of the learning work is done with the mainstream, the facilitator/teacher needs to be an ally to margins to help them find their voice and state their demands. Assisting the mainstream to renegotiate its relationship with the margins results in an overall group movement toward equality and mutual respect. It becomes apparent that direct education's approach is to support conflict between mainstream and margins while going outside the comfort zone of participants.

In *Part II: Diversity, Difference, and Emotions in Group Learning* Lakey shows that participants in a learning group are amazingly different from each other, even if they believe they are homogeneous. Lakey begins Chapter 5 by advising facilitators to trust in the secret life of the group and build bridges to it with activities designed to support mutual self-disclosure. He points out the need for teachers to be aware that high performance may follow periods of storming. Chapter 6 prompts facilitators to be prepared to assist participants in the identification of their mainstream and marginal identities as they introduce them to the complexities of the real world. The chapter admonishes facilitators to acknowledge group differences in order to accelerate learning and suggests that a learning community has a steep learning curve. The author points out characteristics of the group's margin are often in contrast with the mainstream of the group and facilitators must learn to confront and deal with oppressive behaviors in the group setting.

Chapter 7 suggests that facilitators model a pro-diversity, pro-conflict, and pro-discomfort attitude while remaining aware they are unconsciously privileging mainstream communication styles and customs. Lakey points out that diversity issues and conflict styles must be addressed and he uses his personal experience as a European American living in a biracial family with African Americans as an example. He suggests employing a discussion of cultural assumptions about communication and conflict in the black/white culture and using meta-communication as an intervention to assist emergence of authentic reactions. In Chapter 8 Lakey reminds the readers that as facilitator you must let go of the management job assigned by class society, mobilize your curiosity, and be aware that social class and diversity often combine to squelch natural curiosity. He also explores how to challenge the cultural practice of "calling out" an individual engaged in oppressive behavior.

Chapter 9 offers advice to be on guard for authentic expression because a relevant learning curriculum will often result in an emotional learning experience for the group, but many individuals have learned to control their emotions while others expose their emotions by acting as caretakers for the emotional needs of the participants.

Part III: Designing Learning Experiences explores principles of workshop and curriculum design that actually work. Chapter 10 discusses the classical four-step model of experiential education developed by Kolb (experience, reflect, generalize, and apply), stressing that it is essential for multicultural learning groups. Chapter 11 advises that participants in the learning group already know much of what they need to know in order to move ahead and that rather than residing in each participant the knowledge is within the group. The challenge is to get the group to tell their story. Lakey uses Chapter 12 to discuss the phenomena that learning difficult material depends on how well the thing to be learned fits the belief system of the participants.

In Chapter 13 Lakey reveals that learning groups need times of integration, working as a group, and differentiation, working as subgroups, and will create this rhythm if it is not provided by the facilitator. He goes on to tell us in Chapter 14 that direct education should maintain accountability to the stated workshop goals along with a commitment to assist participants in reaching their own learning goals wherever possible. Then in Chapter 15 we understand that emergent design requires good facilitator preparation in order to deal with the dynamic goals of the participants within the confines of the workshop goals.

Part IV: Facilitation takes us through the final portion of the process by discussing instructional design and intervention along with the need for framing and cultural sensitivity in our group setting. In Chapter 16 Lakey gently reminds the reader that the major aspects of setting the tone are signaling the relationship you want to have with the group and explaining the parameters of the situation while remaining aware that most participants want to fit in. He tells us it is imperative facilitators assure the group is a safe place for learning, and working with the group. Chapter 17 builds on the premise by making us aware that sources of edgy facilitator interventions often come from awareness of timing and awareness of the main projections placed on the facilitator.   The astute reader realizes that both of these often function to invite participants out of their comfort zone so they can learn.

Once again working the topic of the mainstream and the margin, Chapter 18 tells us the primary thing facilitators can do is help participants learn to frame and reframe while simultaneously exploring the margins and the mainstream for intervention opportunities. We understand from this chapter that the author's use of storytelling presents an opportunity to elicit participant responses that may lead to a reframe for the group. In Chapter 19 Lakey openly tells us facilitation is hard to accomplish in the best situations. He lets us know that working with new or unfamiliar cultures makes group diagnoses more difficult and should only be attempted after setting aside assumptions and replacing them with curiosity and honor. He also points out that an awareness of the cultural situation and the value of presenting an appreciative presence are necessary when crossing cultural lines.

In a final call to action, Chapter 20 asks the facilitator to watch for transformational moments that signal when the group is open to letting go of a block to learning as well as teachable moments when the group is open to new learning. The realization here is that encouraging participants to confront their limiting beliefs opens the door to transformational possibility. Finally, Chapter 21 sums up by pointing out that direct education harnesses the unique motivation of the learner and the safety of the group container while helping participants maintain an awareness of their personal responsibility as they form an interdependent relationship with their leader, one that enables a group to complete the training. The Appendices contain additional cases and resources for supplemental reading on the topic of direct education.

Book Review

Teaching Ethically: Challenges and Opportunities

DeDe Wohlfarth[1]

Citation: Landon, R. E., & McCarthy, M. A. (2012). Teaching ethically: Challenges and opportunities. American Psychological Association.

Publishers Description: Educators work within a fluid academic and social landscape that requires frequent examination and re-examination of what constitutes ethical practice. In this book, editors R. Eric Landrum and Maureen McCarthy identify four broad areas of concern in the ethical teaching of undergraduate psychology: pedagogy, student behavior, faculty behavior toward students, and considerations in the diverse classroom. Together with their team of experts, they provide evidence-based advice and case studies that illustrate the application of relevant ethical principles.

Ethical teachers need to reflect on commonly accepted practices and make individual decisions about responsible teaching behaviors, such as honoring individual differences and respectfully challenging beliefs. Other challenges examined in this book include grading, textbook adoption, honor systems, online instruction, and conducting and using research on pedagogy to improve classroom practice. Infusing the undergraduate experience with ethics is the focus of chapters on supervising student internships, coauthoring research with students, and modeling appropriate professional boundaries.

Readers will find a host of practical suggestions for approaching ethics proactively in both traditional and virtual classrooms. This book will become an instant resource for all teachers in the social and behavioral sciences who care about ethical interactions between faculty members and students.

I don't know you, but I suspect we have something in common: we are both busy. You are likely too busy to read this review to its conclusion and are probably skimming its surface for a quick "yea/nay" bottom line. And I can promise that I was too busy to read a book and write a thoughtful review on it, between juggling four kids playing soccer and basketball and their concomitant endless laundry to wash with a full time professor job with its concomitant endless stack of papers to grade. But as I finished R.E. Landon and M.A. McCarthy's (Eds.) *Teaching Ethically: Challenges and Opportunities*, I knew I had to write a smashing review. So, the short answer regarding if this book is worth the $49.95 cover price is: YES! BUY IT! READ IT! IT'S FANTASTIC!

The more nuanced rationale behind my opinion follows. On the first day after I read the book, I quoted from Chapter 1 to help resolve an intense debate in a faculty meeting regarding the tension between academic freedom and program cohesiveness as epitomized by the question of whether the department needed to adopt the same textbook across all class sections. On the second day after I read the book, I referenced Chapters 5 and 7 to answer my department chair's Dilemma Du Jour regarding the best ways to promote academic integrity and decrease cheating in on-line courses. On the third day after I read the book, I was running (where I do my best

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thinking) and did some soul searching about how we, as faculty members, have both successfully navigated and horribly botched the muddy terrain of faculty-student boundaries over the last few years. Chapter 12 helped me find some new perspectives regarding boundaries and I could finally put some issues to rest that had once dominated my thoughts for every mile that I ran. The following day, some students approached me with a question about managing some tough conflicts around the ethics of participating in university research interest groups, particularly in regards to the "rules" for receiving publication and presentation credit. I was able to answer them in a thoughtful manner as I recalled Chapter 16. And finally, when a doctoral student working on her dissertation asked me if I knew of any current research regarding professors' responsibilities to accommodate students with disabilities, I shared Chapter 11's references for her as we discussed the current research in this area.

In summary, this book has already become a favorite because it has made my chair think I am smarter, my students think I am more helpful, and my colleagues think I am wiser than I really am. (To be fair, it has only increased my children's opinion of me as a colossal nerd-mom, but that's hard image to shake when you read textbooks while waiting at sports practices.) I have dog-eared pages, highlighted sections, and written peoples' names in the margins of ideas I want to share with them. I have loaned out the book twice in two weeks, only to ask for it back because it helped me to ethically and thoughtfully resolve yet another challenge.

In short, read the book. And a bonus to you busy people, who I thank for still reading this review: lots of white space on each page and short chapters makes for easy reading while cooking macaroni.

Book Review

The Jossey-Bass Reader on Contemporary Issues in Adult Education

Ryan Bronkema[1]

Citation: Merriam, S. B., & Grace, A. P. (Eds.). (2011). *The Jossey-Bass reader on contemporary issues in adult education.* San Francisco, CA: Jossey-Bass. ISBN: 978-0-470-87356-4

Publisher Description: This essential resource is compiled by experts in the field and contains the best, most recent previously published literature on the contemporary issues and includes trends affecting adult education. Compelling to practitioners in the field as well as useful in foundations or introductory courses on adult education, it covers topics such as social justice; diversity and marginalization; human resource development; lifelong learning; globalization; the role of mass media and popular culture; technology; and heath, welfare, and environment, all within the context of adult education.

Contemporary Issues in Adult Education is a thorough survey of modern literature concerning adult education. The book's 30 unique chapters are subdivided into five themed sections. Each section is opened with a summary written by Merriam and Grace describing the connections of the section's material to the common theme of adult education. As a whole, this book is filled with helpful insights to current issues that dominate adult education and provides context for readers who may not have had much exposure to the topic, and a current literature review for those seasoned adult education readers.

The first section of the book (chapters 1-7) discussed the foundational issues that provide context for the current status of adult education with outlines defining adult education, pedagogy, and underrepresented adult learners. The section opens with a definition of adult education as the place "where vocational education leaves off" and that "experience is the adult learners text book" (p. 9). This context is key to connecting themes discussed within the following chapters of the book, as some of the connections are difficult to make if the reader is thinking of the classroom as an educational method. There is also a rich base of cultural history included within this section that provides a background to the current biases and trends found within adult education. These themes offer a great base to review the history of adult education and add context to its future while setting up additional material.

Section two (chapters 8 – 13) included a description of how global context impacts the scope of adult education throughout the world. There are varied perspectives discussed, from policy research to cultural norms that affect the opportunities facing various adult constituents throughout the world. These contrasting views help to define

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the various struggles adult learners face within different areas of the world. Definitions like these help to compose the complexity that the field of adult education faces when trying to get a pulse on its future.

The third section (chapters 14 – 19) discussed the competing interests of adult education and the learning opportunities that are frequently utilized by adults. Topics including social classism and financial access to education throughout the world are discussed. Additionally, shaping the development of these challenges in the future is given consideration. Global adult learning interests are also addressed briefly within this section to add depth to the varied learning necessities worldwide. For example, some areas of the world utilize adult education to reduce continued poverty while, in other areas, human resource management is used as a form of adult education to reduce gender inequities. The two examples both have merit, but use different contextual frameworks of privilege and are presented through an adult educational lens.

Section four (chapters 20-25) discussed the changing landscape of adult education. Topics like adult learning theory, emotional implications of adult learning, and mass media impacts are addressed. This section also addresses potential future themes of adult learning research and would be a great place to start reading for those researchers interested in current potential adult education research topics.

The fifth and last section (chapters 26-30) discussed emerging areas of research related to adult education including popular culture, postmodern pedagogy, and activism. This section serves as a catch all for relevant topics to the future of adult education that did not appropriately fit under a prior section theme. While scattered in subject, the chapters of this section were some of the most informative within the whole book.

While the content of the book was insightful there were several noticeable grammatical and formatting errors throughout. Also, at times, identifying the common definition of adult education was difficult as it related to the context of the entire book. The first chapter starts with defining adult education as any learning that happens after formal classroom learning ends. Throughout the book some chapters align with this theme well, while other chapters do not seem to have any alignment other than their concern for issues adults face. This convoluted writing made synthesizing the large number of diverse topics into the theme of adult education, even with the introductions by the editors, more difficult than necessary.

Contemporary Issues in Adult Education has applicability to any practitioners, faculty, or researchers that have interest in information about adult education. The discussion questions provided through the introductions of each section also serve as reading cues to dive deeper into the material. The unique chapters are useful tools for both teaching about and orientation to current materials. However, as a complete work there may be little application to any one reader given the breadth of topic coverage.

Mission

Founded in 2001, the Journal of the Scholarship of Teaching and Learning (JoSoTL) is a forum for the dissemination of the Scholarship of Teaching and Learning in higher education for the community of teacher-scholars. Our peer reviewed Journal promotes SoTL investigations that are theory-based and supported by evidence. JoSoTL's objective is to publish articles that promote effective practices in teaching and learning and add to the knowledge base.

The themes of the Journal reflect the breadth of interest in the pedagogy forum. The themes of articles include:

1.   Data-driven studies: formal research projects with appropriate statistical analysis, formal hypotheses and their testing, etc. These studies are either with a quantitative or qualitative emphasis and authors should indicate the appropriate domain. Acceptable articles establish a research rigor that leads to significant new understanding in pedagogy.

2.   Reflective essays: integrative evaluations of other work, essays that challenge current practice and encourage experimentation, novel conclusions or perspectives derived from prior work

3.   Reviews: Literature reviews illuminating new relationships and understanding, meta-analysis, analytical and integrated reviews, etc.

4.   Case studies: These studies illustrate SOTL and its applications, usually generalizable to a wide and multidisciplinary audience.

5.   Comments and communications: Primarily, these are comments based on previously published JoSOTL articles, but can also include book reviews, critiques and evaluations of other published results in new contexts or dimensions

Submissions

Authors are encouraged to submit work in one of the following categories:

- **Traditional Research Reports: data driven studies with either a quantitative or qualitative emphasis**
- **Reflective Essays on SoTL**
- **Reviews of current themes in SoTL research including meta-analysis**
- **Case studies illustrating SoTL and its applications**
- **Comments and Communications on previous Journal articles, or book or software reviews**

All submissions for JoSoTL should be submitted using the online submission process on our website beginning on July 1, 2012.

Please follow this link to get more detailed information on the submission process for the Journal of the Scholarship of Teaching and Learning:
http://josotl.indiana.edu/about/submissions#onlineSubmissions

If you have additional questions or run into problems please contact the journal at josotl@iu.edu.

Editorial Board

Style Sheet for the
Journal of the Scholarship of Teaching and Learning

John Dewey[1] **and Marie Curie**[2]

Abstract: This paper provides the style sheet for the Journal of the Scholarship of Teaching and Learning. Manuscripts submitted for publication should adhere to these guidelines.

Keywords: radiation, metacognition, identity theory, constructivism, educational philosophy.

I. General Guidelines for the Manuscript.

The final manuscript should be prepared in 12-point, Times New Roman, and single-spaced. Submissions should be double-spaced. All margins should be 1 inch. The text should be fully left- and right-justified. The title (in 16 point bold) and author's name (in 12 pt. bold) should be at the top of the first page. The author's name should be followed by a footnote reference that provides the author's institutional affiliation and address. The abstract should be indented 0.5" left and right from the margins, and should be in italics.

Except the first paragraph in a section subsequent paragraphs should have a 0.5" first line indent. Use only one space after the period of a sentence (word processors automatically adjust for the additional character spacing between sentences). The keywords should be formatted identically to the abstract with one line space between the abstract and the keywords. Authors should use keywords that are helpful in the description of their articles. Common words found in the journal name or their title article are not helpful.

Pages should be unnumbered since they will be entered by the Journal editorial staff. We will also insert a header on the first page of the article, as above.

References should be incorporated in the text as authors name and date of publication (Coffin, 1993), with a reference section at the end of the manuscript (see below for the desired format for the references). Titles of articles should be included in the references in sentence case. Unless instructed otherwise in this Style Sheet, please use APA style formatting. Footnotes should incorporate material that is relevant, but not in the main text.

A. Plagiarism.

It is essential that authors refrain from plagiarism. Plagiarism is a violation of ethics and, in serious cases, will lead to a manuscript being rejected by this journal. No future manuscripts will be accepted from authors who have submitted a plagiarized manuscript.

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B. Unique work.

This journal does not accept previously published work. We also do not accept work that is being considered for publication by another journal. If your manuscript is accepted, you will be required to sign a form stating that your manuscript has not been previously published.

II. Section and Sub-Section Headings.

A. Major Sections.

Major section headings should be flush-left, bold-faced, and Roman numeral numbered. Major section headings should have one-line space before and after. The first paragraph(s) of the article do not require a major heading.

B. Sub-Sections.

Sub-section headings should also be flush-left, in italics, and alphabetically numbered. Sub-section headings should have a one-line space before and after. Sub-sub-sections should appear at the beginning of a paragraph (i.e., with an 0.5" indent, followed immediately by the text of the sub-sub-section), with the heading also in italics.

III. Tables and Figures.

Tables and figures should be inserted in the text where the author believes they best fit. They may be moved around a little to better correspond to the space requirements of the Journal. If necessary, tables and figures may occupy an entire page to ensure readability and may be in either portrait or landscape orientation. Insofar as possible, tables should fit onto a single page. All tables and figures should be germane to the paper. Tables should be labeled as follows with the title at the beginning (in bold), with data entries single-spaced, and numbered. Column labels should be half-line spacing above data.

Table 1. The title of the table.

Unit	Length, inches
Point	1/12
Pica	1/6

Figures should have their captions follow the image. Captions should be single-spaced, with title in bold. Additional text should not be in bold. The Editorial staff may adjust layout to allow optimal use of space.
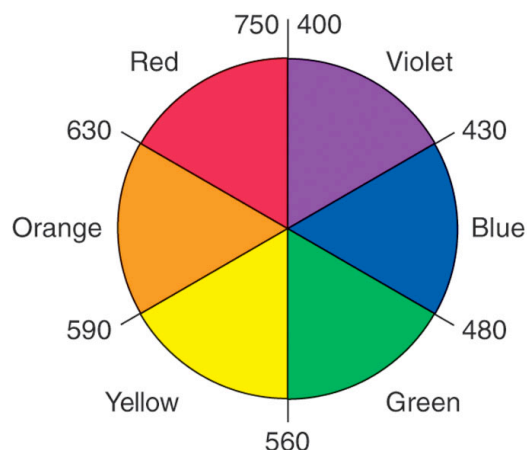
Figure 1. Color wheel with wavelengths indicated in millimicrons. Opposite colors are complementary.

Acknowledgements

Acknowledgements should identify grants or other financial support for this research by agency (source) and number (if appropriate). You may also acknowledge colleagues that have played a significant role in this research.

Appendix

Please insert any appendices after the acknowledgments. They should be labeled as follows:

Appendix 1. The Title of the Appendix.

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