

**The College of New Jersey  
Task Force on Instructional Technology**

**Report to Steering and the Provost  
February, 2015  
Revised June 2015**

## TABLE OF CONTENTS

Official Charge .....	<a href="#">1</a>
Task Force Members .....	<a href="#">2</a>
Introduction .....	<a href="#">3</a>
Key Recommendations Overview.....	<a href="#">5</a>
Rationale.....	<a href="#">7</a>
Conclusion.....	<a href="#">11</a>
References .....	<a href="#">12</a>
Appendix.....	<a href="#">14</a>

## CHARGE TO THE TASK FORCE

### The College of New Jersey Task Force on Instructional Technology September 2014

#### **Charge to the Task Force**

The Task Force on Instructional Technology will outline a vision and direction for TCNJ's use of technology in teaching and learning. This Task Force will address two related goals:

*Goal 1: To explore the role of instructional technology in face-to-face classes as a tool for enhancing teaching and learning. What technologies are faculty excited about using? How can we foster communication across departments and offer more opportunity to create a community for sharing success in this area? What additional resources are needed?*

*Goal 2: To evaluate the potential for the success of expanding blended and online courses at TCNJ to include fall and spring terms. What is the student interest? How can we stay true to our institutional mission and identity while exploring new course delivery practices? What lessons have been learned from other similar institutions that have expanded in this area ahead of us? What procedures need to be in place to ensure consistency and quality?*

#### **The Task Force will:**

- Evaluate student and faculty interest in furthering TCNJ's use of instructional technology and explore the role blended and online courses might play on campus given our institutional mission and identity.
- Ensure procedures and approaches we take at TCNJ will be evidence-based.
- Create a vision for TCNJ's use of instructional technology, including a strategy for supporting the development of blended and fully online courses for departments wishing to experiment in this area.
- Make recommendations and develop a timeline for faculty development/training initiatives to provide the necessary support for all delivery methods.
- Identify institutional resources needed to prepare faculty and students for success in courses that rely heavily on technology.
- Make recommendations for policies (including those that belong in governance) and procedures surrounding the delivery and creation of blended and online courses, including issues such as creation, scheduling, registration, communication, outreach, assessment, support, etc.

## TASK FORCE MEMBERS

*Matthew Bender*

Associate Professor of History  
Director, Program in International Studies

*Michael Chiumento*

Applied Mathematics Major  
TCNJ Class of 2015  
Executive Vice President, Student Government Association

*Casey Dowling*

Psychology Major  
TCNJ Class of 2016  
Vice President of Academic Affairs for Student Government

*Judi Puritz Cook \**

Director of Instructional Design

*Cassandra Gibson*

Assistant Professor, Counselor Education

*John Kuiphoff*

Assistant Professor, Interactive Multimedia

*Brenda Leake*

Associate Professor, Dept. of Elementary & Early Childhood Education  
Director, TCNJ Center for Excellence in Teaching & Learning  
Program Coordinator, TCNJ-South Africa Graduate Programs

*Ann Marie Nicolosi*

Associate Professor and Chair, Women's and Gender Studies

*Monisha Pulimood*

Associate Professor and Chair, Computer Science

*Chandru Rajam*

Vice Provost for Graduate, Professional and Continuing Education

*Matthew Wund*

Associate Professor of Biology

\*Task Force Chair

## **INTRODUCTION**

Providing TCNJ faculty and students with contemporary instructional technology tools and innovative techniques that further teaching and learning is important to our growth as an institution. On our own campus and beyond, our Task Force identified many ways in which technology contributes to the teaching and learning process in a meaningful way. In many ways, blended and online pedagogical tools present enhanced opportunities for teaching, learning and collaboration over traditional instructional methods (Barker, 2003; Garrison and Kanuka, 2004).

The integration of new instructional technologies is essential to ensuring that our graduates are prepared for the opportunities and challenges of the 21<sup>st</sup> century. The International Society for Technology in Education (ISTE) has developed a list of six standards that students need to be developing in our classrooms using digital technology. These include (1) creativity and innovation, (2) communication and collaboration, (3) research and information fluency, (4) critical thinking, problem solving, and decision making, (5) digital citizenship, and (6) technology operations and concepts ([www.iste.org/standards/standards-for-students](http://www.iste.org/standards/standards-for-students)). It is crucial that TCNJ develop and support new tools, techniques, and modes of instruction that both serve the needs of our students and support the College's mission and identity.

We were particularly interested in connecting our integration of instructional technology with our Signature Experiences, which factored heavily in our recommendations. In doing so, we want to ensure that implementing online/blended pedagogy is a means towards enhancing our Signature Experiences and furthering the Mission of TCNJ, rather than a superficial end in itself. We see opportunities to enhance our Signature Experiences through instructional technology in a number of ways:

### **Personalized, Collaborative and Rigorous Education.**

New technologies have made it easier to communicate, share documents, converse and otherwise engage with faculty and students—all with the ease of ubiquitous devices available anywhere, anytime. Better access to quality data, computing power, and people improve collaboration on research projects without the limitations of space and time.

### **Undergraduate Research, Mentored Internships and Field Experiences.**

We envision the potential of online and blended learning to play a major role in expanding opportunities for our students in their research, their internships and their work in the field. As the very idea of what constitutes “field” evolves, virtual contact presents new ways for our students to gain access to information, access to collaborators and mentors—inside and outside the TCNJ community—and access to first-hand experience. Collaborative technologies break down barriers and expand our opportunities far beyond the borders of our campus.

### **Community-Engaged Learning.**

When it comes to developing empathy towards and sensitivity to the suffering and challenges facing our fellow human beings, there can be no substitute for in-person interaction. Even so, there is an increasing number of largely information-intensive service opportunities that can

be performed remotely. Examples would include developing and maintaining social-media presence for NGOs and volunteer organizations; staffing hotlines; mentoring or remote tutoring of at-risk youth or other vulnerable groups, e.g., inmates, etc. Social innovations and entrepreneurship increasingly entail leveraging technology to deliver imaginatively-new social services, lower the cost of traditional ones, or reach more people faster more effectively.

### **Global Engagement.**

Perhaps the Signature Experience where digital tools offer the greatest promise is enhancing Global Engagement—for students and faculty, alike. Web-based videoconferencing allows students from culturally-dissimilar countries to communicate in real-time on issues confronting our common humanity. Asynchronous possibilities exist as well, where teams of students across the globe can work on brainstorming problems, interviewing subjects, gathering and analyzing data, and other collaborations.

### **Leadership Development.**

Leadership can unfold in different ways, including leading through knowledge/expertise, via negotiation/ conflict-reduction skills, serving as a convener, catalyst or manager for change, a peer-mentor, etc. With the right tools put to work in the curriculum, TCNJ students can connect and mentor high school students from a distance; arts majors can critique works of art on other campuses; Education students can serve as remote Teacher's Assistants in under-resourced schools; Nursing students can serve under-resourced hospitals with their administrative burden; Engineering & Science students could offer to be apprentices to practicing engineers and research scientists. In extra-curricular roles, students can hold regional/ national/ global office in organizations virtually. They can build networks for student organizations and share resources with other institutions.

## KEY RECOMMENDATIONS OVERVIEW

Once we mapped out the places where instructional and Internet technologies can play important roles in supporting our Signature Experiences, we set about identifying our institutional needs for moving forward. We have identified **15 recommendations** to facilitate more strategic integration of instructional technology on campus that focus on the **infrastructure, awareness, training, strategic planning and evaluation** needed to successfully increase our strategic use of instructional technology on our campus:

1. Initiate steps to provide for a more robust technology infrastructure on campus. This includes faster and more reliable Internet connections; expanded Wi-Fi service; the establishment of a digital video service on campus for recording, editing and storing video; Google tools for faculty, etc.
2. Provide for increased opportunities on campus where faculty, students and staff can see instructional technology in action through guest speakers, educational workshops, and other campus events. We believe our campus would benefit from seeing specific examples of ways in which digital tools can be used to meet course learning goals and to further our Signature Experiences.
3. Continue to support faculty pioneers for their leadership with release time, stipends, equipment, or other incentives for integrating innovative approaches to teaching and learning with technology.
4. Review support for our faculty in the use of the Canvas Learning Management System. If we are going to increase faculty use of Canvas, we need to be sure we have the support in place to handle the expansion.
5. Review support for our students to ensure that TCNJ students are prepared for whatever digital tools they may encounter in the classroom. For students enrolled in blended or online courses, develop visible support channels to ensure success with instructional technology.
6. Continue the strategic offering of blended and online courses in the summer, winter and minimester semesters, when existing TCNJ students and other student populations will appreciate the flexibility of these alternate modes of instructional delivery. Before a blended or online course is offered in a fall or spring term, the justification for offering the specific course in an alternate format must be presented by the host department, the school dean, and the Office of Instructional Design. If it is determined that the course is both suitable for this format and that the alternate delivery mode enhances at least one of TCNJ's Signature Experiences, the faculty member who has proposed the course may apply to work with the Office of Instructional Design to build the course.

7. Require faculty teaching blended and online courses to participate in formal training on best practices through the Office of Instructional Design during the semester prior to the course offering.
8. Require all blended and online courses to go through a rigorous peer review process prior to being offered as part of the curriculum. This would include a department-level review, school-level review, and a College-level review through the Office of Instructional Design.
9. For any required undergraduate courses, students seeking face-to-face courses must always have that option. The election to take a blended or online course should be a student's choice, not a requirement or an only option.
10. Academic schools should consult with their deans and with academic affairs in recommending enrollment caps for blended and online courses, but those caps should reflect the best practices supported in the literature. We recognize the need for a lower course cap for blended learning than for traditional classes. As course size goes up, quality of course and student satisfaction goes down. Online and blended courses should not exceed caps that would prevent us from offering students the personalized, collaborative experience they seek at TCNJ.
11. Work with TCNJ's Office of Records and Registration to establish guidelines for communicating the details of blended and online courses to students. This process will allow students to make informed decisions about their course selections.
12. Review our current course evaluation instruments and develop an equitable instrument for alternate methods of course delivery that addresses features unique to the digital environments.
13. Continue to build the resources available through the Center for Excellence in Teaching and Learning and the Office of Instructional Design in order to keep faculty current on best practices in the use of digital tools for teaching and learning.
14. Ask the Committee on Faculty Affairs to consider revisions to the Promotions Document that would lend greater support to innovation in teaching and the development of blended and online courses.
15. Chart our progress by regularly assessing blended and online courses to ensure they are rigorous, effective and true to our Signature Experiences.



## RATIONALE

**Infrastructure.** “Reliable and robust” IT infrastructure and support are essential to the success of any online-blended initiatives in higher education (Dziuban & Hartman, 2013). Even aside from the need to increase the capacity for instructional technology, one of the top ten technology issues facing higher education is the challenge of the “device explosion”—students and faculty coming to campus with multiple devices and the burden it places on the network (Grajek, 2013). If we want to expand our overall success with instructional technology on the TCNJ campus, it begins with stabilizing our network and ensuring that all users have a reliable, fast connection to the Internet, with more widespread availability of Wi-Fi. Far too many faculty, staff and students on our campus encounter slow speed, unreliable connections, and bandwidth issues when trying to access our network. The Task Force has identified this as a top priority.

In addition to stabilizing and expanding our network capabilities, a number of our existing IT services need expansion if we wish to support the development of digital resources for blended and online courses:

1. Digital video and audio. Digital video and audio projects provide valuable tools for any blended or online course (See Beaudoin, 2014; Bovard, 2010; Griffiths & Graham 2009; Kovach, Ding, & O'Neil, 2010). Our faculty need the resources to record and edit digital video projects. At a minimum, all online courses should have a welcome video to introduce the students to the course. While some equipment exists on campus, there is no mechanism in place to bring a staff member to a class or campus event to record and edit a video.
2. Server Space/Digital Repository. Our current learning management system, Canvas, has space limitations that a number of faculty have already exceeded through uploading digital content. When the space in Canvas is not sufficient, faculty need reliable server space for making digital content available to their students.
3. Google Tools. While our students are currently supported in the use of Google Apps for collaborative online work, faculty and staff are not. In addition to fostering collaborative productivity through the use of Google Docs and Sheets, Google Drive’s large, cloud-based data storage system provides one potential solution to our current server space/digital repository constraint (content stored in Google Drive can be linked to Canvas pages). The Task Force recommends that we explore ways to work with Google to establish Terms of Agreement that satisfy our TCNJ FERPA requirements.
4. Support. Having the tools and knowing how to use them are important, but we also need ongoing support in the use of technology in order to remain successful as digital tools rapidly evolve. We recommend working with IT and the Office of Instructional Design to evaluate and enhance current support systems for faculty and students.

**Awareness and Community Buy-in.** Successful implementation of a major technology initiative requires an institution, its faculty and students to share the same goals (Barker, 2003; Dziuban & Hartman, 2013; Graham *et al.*, 2013; Owston, 2013). We recommend that resources continue to be allocated for guest speakers, conference travel, and institutional memberships that engage faculty in best practices for blended, online and technology-enhanced teaching in order to help our campus community understand the opportunities and benefits to teaching with technology. We need to provide concrete examples of the ways in which our Signature Experiences can be enhanced with digital tools. Educational initiatives will also help provide a common understanding of what blended and online courses can look like on our campus (as well as what they should not look like).

This fall, TCNJ became a member of both Quality Matters (<http://qualitymatters.org/>) and The Online Learning Consortium (<http://onlinelearningconsortium.org>). Both organizations provide valuable research, insights and advice for best practices in the delivery of online course content. The Task Force recommends that we continue our affiliation with these professional organizations and also seek other ways to bring best practices to our campus through local and regional connections, such as a greater involvement with NJEdge (<http://njedge.net/>), a consortium of academic and research institutions that facilitates the productive use of technology in academic endeavors.

We need to champion our existing technology pioneers on campus as well. Many faculty across the TCNJ campus have taken steps to innovate and implement technology in their teaching. These pioneers are valuable resources to other faculty, and we need to explore ways to shed light on their accomplishments and connect faculty with experience and success in technology with others who want to learn. (See “Training and Support” for more on the need for tech mentors on campus.)

Students need to be part of this campaign, too. Our student representatives on the Task Force illustrated the need for a shared vision of what benefits current technologies might have for enhancing the TCNJ experience. We discussed the existence and limitations of existing student IT surveys, and made a conscious decision not to update the IT student survey at this point in time out of a concern that we’d be assessing student interest based upon their misperceptions about what online/blended actually is. Therefore, we felt that by framing online/blended around TCNJ’s Signature Experiences and an assurance of instructional quality, we would de facto provide the students with the type of experience they came looking for at TCNJ. Once online/blended becomes more commonplace, such that the whole community understands what it is, we can then have more meaningful feedback from the students.

**Training and Faculty Support.** According to Ginsberg and Ciabocchi (2014), successful faculty development programs provide for “human, financial, and technical resources” to support faculty in their development of blended and online courses. We agree that TCNJ faculty need training in both the tools and best practices associated with integrating teaching and technology, and that they should be compensated for their participation in this training. Currently, the Office of Instructional Design and the Center for Excellence in Teaching and Learning are offering training sessions and stipend designed to meet these needs. We recommend that these efforts continue and grow.

Training needs to focus on:

1. Technical features of the tools faculty and students will be using.
2. Pedagogical issues/Best practices.
3. Fostering innovation.
4. Building tech leaders on campus.

With SOCS completely retired and Canvas taking over as our Learning Management System on campus, it is vital to provide faculty with training in the nuts and bolts of using the system to its full capacity. While many faculty have embraced the new LMS, there is an eagerness to move beyond simply posting a syllabus or collecting assignments. We recommend that the Office of Instructional Design develop additional programs to deliver both the technical training (at multiple levels, beginner through advanced) as well as the best practices training necessary to use Canvas most effectively.

We have faculty on our campus who are interested in other digital teaching tools (for example, using Camtasia for video screen capture). When faculty express an interest in exploring an innovative way to successfully enhance their teaching and thereby build on the Signature Experiences we are able to offer at TCNJ, our campus needs a support system to make that happen. This support could come in the form of stipends, release time, having a positive impact on the tenure/promotion process, etc. “People” support through IT as well as the Office of Instructional Design would be beneficial in fostering this innovation.

**Strategic Planning.** The Task Force is in agreement that technology integration should take place where it makes sense, and not simply for technology’s sake (Barker, 2003). The decision on when to offer a blended or online section should be made with approval from both the department and the school where the course originates, based on a belief that the blended or online section adds value and strengthens our Signature Experiences. Once approved, a faculty member must work with the Office of Instructional Design to build the course and ensure that it conforms to the best practices model we are using (currently, this is the Quality Matters rubric). Training for the delivery of the course should be mandatory for any faculty member in order to ensure consistency in quality of our blended and online offerings.

Our student representatives felt strongly that no TCNJ student should be forced to take an online section of a class. Any traditional undergraduate student should have the ability to satisfy his or her degree requirements in a timely manner with entirely face-to-face classes.

Existing evidence regarding class size suggests that as class size increases with blended and online courses, faculty ability to engage in deep interaction with students decreases, as does student engagement in the actual course (See [Appendix](#)). Research also reveals that faculty online presence and communication is critical to student on-line and blended course satisfaction. Therefore, if we wish for blended and online courses to succeed and thrive at TCNJ for both students and faculty, departments and schools need to be strategic in allowing lower caps for blended and online courses.

**Evaluation.** Process evaluation allows for continuous improvement of faculty development and improved quality in course offerings (Dziuban & Hartman, 2103). As we begin this

journey to adopt innovative techniques for enhancing our Signature Experiences, we need to prepare up front for monitoring our growth and assessing both our successes and challenges. Everyone on the Task Force feels strongly that we must ensure quality in our blended and online offerings.

We urge TCNJ to assess all blended and online courses and programs through a variety of tools, many of which are recommended in the 2013 Online Learning Consortium Quality Scorecard (<http://onlinelearningconsortium.org/consult/quality-scorecard/>): satisfaction surveys, course evaluations, retention rates, accessibility compliance checks, peer review, departmental review, self-review by faculty, etc. A multi-faceted, quantitative and widely-accepted rubric or scorecard gives us the chance to reflect on TCNJ's online and blended courses and arrive at ways to improve the experience for teachers and learners alike as well as improve learning outcomes.

In order to do carry out continuous evaluation, it is important for both administrators and the faculty involved to internalize the dimensions of the Scorecard. This will ensure that, from the outset, course design, pedagogical considerations, support for teaching-and-learning and infrastructure are in place, thereby offering robust baselines data. This Scorecard should become part of the required Faculty Training, mentioned elsewhere in this Report, so that faculty can design their courses with these considerations in mind.

At an institutional level, data from continuous evaluation should inform strategic and investment priorities for the College in the areas of technology infrastructure, teaching and learning support and faculty development.

## **CONCLUSION**

As digital, Internet, cloud and mobile technologies proliferate and come to transform all aspects of information in our society, it behooves us to keep pace with these changes, and, indeed, draw on them to further our work as students, staff, teachers, scholars and administrators. These technologies, taken together, have the potential not only to advance our mission to educate the bright students we attract, but also make us more efficient in the use of resources. Information and knowledge are the currency of academia; consequently, TCNJ's investments in and use of information and communication technologies should serve as an exemplar in the communities we touch. Lagging behind in the use of technology is inconsistent with our reputation as a well-regarded institution and a sought-after college for the best students.

## REFERENCES

- Aragon, S. (2003). Editor's notes. *New Directions for Adult & Continuing Education*, 100, 1-4.
- Barker, Anne M. (2003). Faculty development for teaching online: Educational and technological issues. *The Journal of Continuing Education in Nursing*, 34. (6), 273-278.
- Beaudoin, P. (2014, July 30). Motivate and engage online learners all semester long. *Campus Technology*. Retrieved January 7, 2015 from <http://campustechnology.com/Articles/2014/07/30/Motivate-and-Engage-Online-Learners-All-Semester-Long.aspx?Page=1>.
- Bovard, Bethany (2010). Video and audio tools for teaching and learning. [Workshop handout]. Sloan-C Workshop, Newburyport, MA.
- Garrison, D. R., & Kanuka, H. (2004). Blended learning: Uncovering its transformative potential in higher education. *The Internet and higher education*, 7, 95-105.
- Grajek, S. (June 3, 2103). Top-ten IT issues, 2013: Welcome to the connected age. *EDUCAUSE Review Online*. Retrieved Jan 21, 2015 from <http://www.educause.edu/ero/article/top-ten-it-issues-2013-welcome-connected-age>.
- Ginsberg and Ciabocchi (2104). Growing your own blended faculty: A Review of current faculty development practices in traditional, not-for-profit higher education institutions. In A. Picciano, C. Dziuban, and C. Graham (Eds.), *Blended Research Perspectives*, (pp. 190-202).
- Graham, C. R., Woodfield, W., & Harrison, J. B. (2013). A framework for institutional adoption and implementation of blended learning in higher education. *The Internet and Higher Education*, 18, 4-14.
- Griffiths, M. E., & Graham, C. R. (2009). The potential of asynchronous video in online education. *Distance Learning*, 6, 13-22.
- Hewitt, J. & Brett, C. (2006). The relationship between class size and online activity patterns in asynchronous computer conferencing environments. *Science Direct*, 49, 1258-1271. doi:10.1016/j.compedu.2006.02.001
- Kovach, J. V., Ding, D. X., & O'Neil, S. L. (2010). Using podcasting and video productions to create valuable student learning experiences. *Quality Advances in Higher Education*, 1(1), 10-17. Retrieved from [http://www.asq.org/edu/2010/02/best-practices/quality-approaches-in-higher-education-vol-1-no-1.%201%20no.%201\(02-2010\).pdf#page=1](http://www.asq.org/edu/2010/02/best-practices/quality-approaches-in-higher-education-vol-1-no-1.%201%20no.%201(02-2010).pdf#page=1)
- Moskal, P., Dziuban, C. & Hartman, J. (2013). Blended learning: A dangerous idea? *Internet and Higher Education*, 18, 15-23. doi.org/10.1016/j.iheduc.2012.12.001

Owston, R. (2013). Blended learning policy and implementation: Introduction to the special issue. *The Internet and Higher Education, 18*, 1-3.

Rovai, A. P. (2002, April). Building a sense of community at a distance. *International Review of Research in Open and Distance Learning, 3*, 1-16.

Taft, S., Perkowski, T. & Martin, L. (2011). A framework for evaluating class size in online education. *The Quarterly Review of Distance Education, 12*, 181-197.

V. E. Varvel, Jr., M. Lindeman, and I. K. Stovall (2003). The Illinois online network is making the virtual classroom a reality: Study of an exemplary faculty development program. *Journal of Asynchronous Learning Networks, 7*, 81-95.

## APPENDIX

# Blended Learning Class Size

There is no empirical evidence from rigorous study to suggest an ideal class size for blended or online courses. Research that does exist seems to imply that the ideal class size for a blended or online course should vary based on individual student characteristics, content area of the course, and expertise of the faculty.

Hewitt & Brett (2007) reviewed the relationship between online learning and class size, and reported both advantages and disadvantages for both large and small. For example, larger sizes allow for a wider range of ideas and perspectives and more opportunities for peer collaboration, although they also increase the amount of information students must process, and decrease faculty availability per student. Surveys of online faculty report a range of faculty-self-determined ideal class sizes ranging from 8 (Rovai, 2002) to 30 (Aragon, 2003). Clearly, this data is simply experience-based opinion.

A review of completed online courses revealed a negative correlation between size of class and the mean size of notes ( $r = -.59, p < 0.01$ ). This suggests that students tended to write shorter notes on discussion postings as the class size increased. This implies that larger class sizes discourage student participation (Hewitt & Brett, 2007).

*J. Hewitt, C. Brett / Computers & Education 49 (2007) 1258–1271*

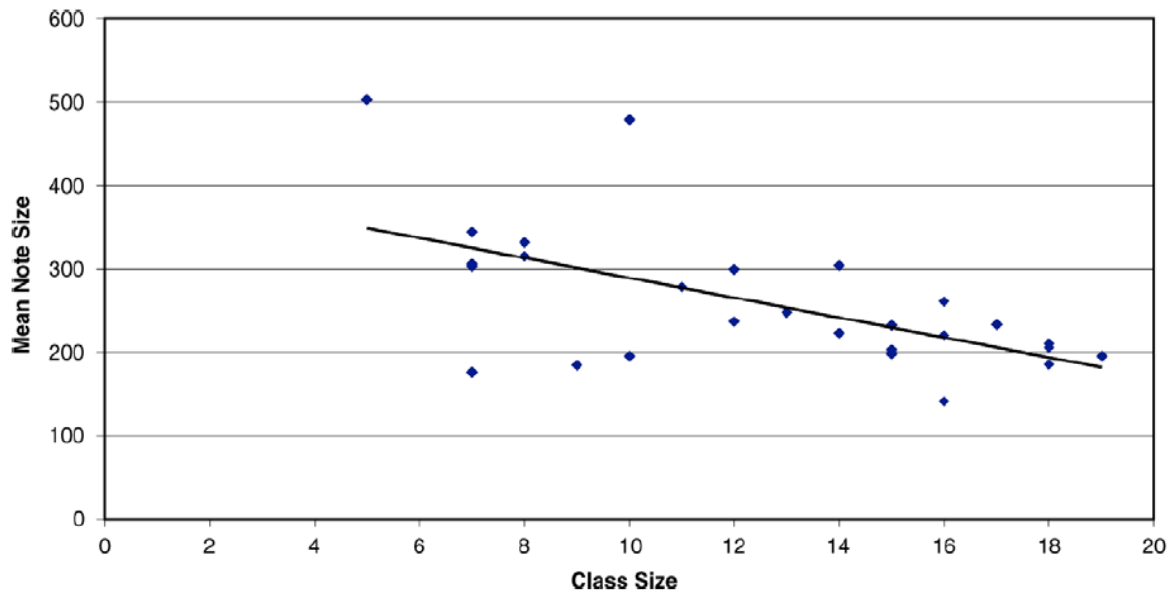


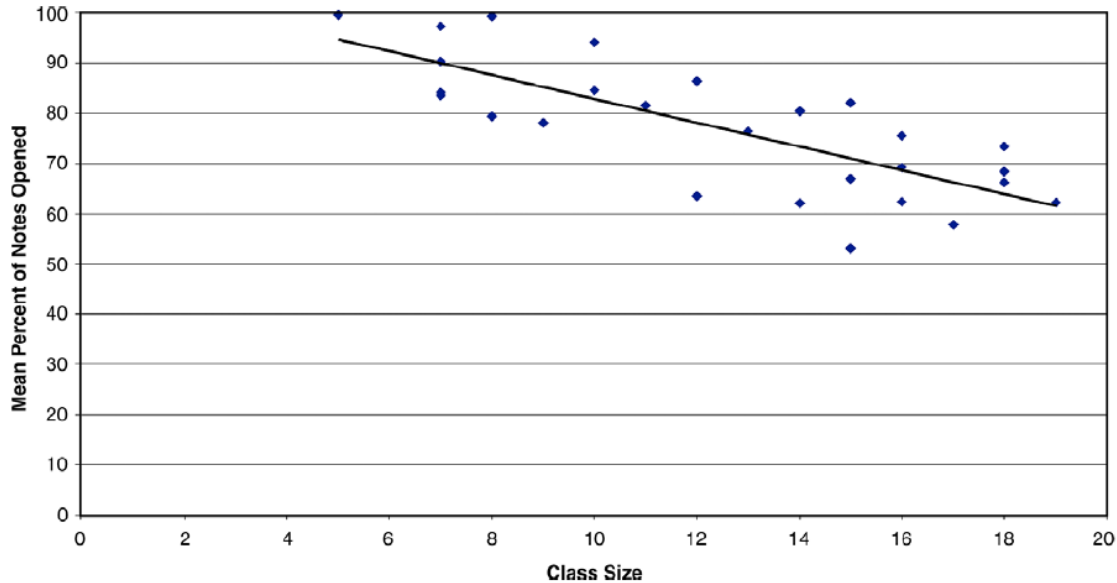
Fig. 3. Class size by average size of note, in words, in each course.

The same relationship occurs as it relates to students opening the posting of their peers. A post is considered to be “opened” by a student if the contents of the post appear on the student’s screen. A test of correlation between class size and percentage notes opened revealed a significant negative relationship ( $r = -0.77, p < 0.01$ ). This indicates that students in



larger classes open a smaller percentage of their peers' notes than do students in smaller classes.

*J. Hewitt, C. Brett / Computers & Education 49 (2007) 1258–1271*



So, although larger class sizes offer diversity benefits, are those diversity benefits realized if students aren't reading those diverse perspectives, or taking the time to reflect on them in their own postings?

Although this study does not propose an ideal class size, rather, it appears to suggest that as the value/benefits of class size increases, alternative benefits of online learning appear to decrease. This leads us back to understanding the 'type' of course being offered, and whether the diverse perspectives are of great value, or is there greater value in deep and rich course engagement?

Researchers from the University of Central Florida conducted a hierarchical logistic regression analysis predicting the variable overall excellent rating or not for online courses, using cumulatively: class size, class level (lower undergraduate, upper undergraduate, graduate), college membership, and department membership. The analysis shows that virtually no predictability is achieved from these characteristics (Moskal, Dziuban & Hartman, 2013). Interestingly, three variables collectively represent 97% of the variance in *excellence rating*: instructor's ability to facilitate learning, his or her communication skill, and his or her respect and concern for students.

These outcomes seem to imply that what is important in determining class size is whether the determined size affects these three variables. As class size goes up, does it diminish faculty's ability to facilitate learning, communicate, or to respond in ways that make students feel respected and valued?

A 2011 review of multidisciplinary research available on varied online college course delivery formats revealed no guidance on best practice for online class size (Taft, Perkowski & Martin). In response, the authors propose the use of 3 educational frameworks to guide class enrollment decisions that maintain educational quality: Bloom's taxonomy, objectivist-constructivist teaching strategies, and the community of inquiry model. The definitions below are quotes from the article.

**Blooms Taxonomy** - *The taxonomy is a classification of 6 levels of learning, moving from lower levels to higher-order thinking: knowledge, comprehension, application, analysis, synthesis, and evaluation.*

**Objectivist** - *In the objectivist model, students learn passively by receiving and assimilating knowledge communicated to them by the professor. It uses largely one-way communication, and students learn individually, independent from others. Courses of a factual or scientific nature are effectively delivered by the objectivist method.*

**Constructivist** - *Constructivist approaches assume that learning of new content results from complex interactions among individual students, faculty, and student peers.*

**Community of Inquiry Model** - *The community of inquiry (COI) model in online education assumes that the instructor's role is critical in potentiating student learning. The model proposes that teaching, cognitive, and social presence all contribute significantly to learning effectiveness within an online community.*

Based on the above frameworks and existing research, the authors suggest ranges of course sizes associated with higher or lower levels of teaching intensity, as represented in the table below.

TABLE 4  
Teaching Intensity: Educational Design Frameworks Relevant to Determining Online Course Sizes

<i>Educational Framework</i>	<i>Dimensions</i>	<i>Recommended Course Sizes Associated With Framework Dimensions</i>
Constructivist-objectivist continuum	<ol style="list-style-type: none"> <li>1. Objectivist approach (all one-way)</li> <li>2. Constructivist approach (all interactive)</li> </ol>	<ol style="list-style-type: none"> <li>1. Large: no known upper limits</li> <li>2. Small-medium: <math>\leq 20</math>-25 students</li> </ol>
Community of inquiry model	<ol style="list-style-type: none"> <li>1. Teaching presence—faculty activity <ul style="list-style-type: none"> <li>• Course design and organization</li> <li>• Facilitating discourse</li> <li>• Direct instruction</li> </ul> </li> <li>2. Cognitive presence: Student activity. Extent to which students are able to construct and integrate new meaning through sustained learning processes. Driven by faculty’s teaching and social presence, and by other students’ cognitive and social presence.</li> <li>3. Social presence: Faculty and student activity. The ability of faculty and learners to project themselves socially and emotionally into a course, and create an identity as a “real person” in the online environment. Driven by faculty’s teaching and social presence, and by other students’ cognitive and social presence.</li> </ol>	<ol style="list-style-type: none"> <li>1. Use of COI principles of course design and organization only: recommended enrollment of <math>&gt; 25</math> students (medium-large)</li> <li>2. Full use of COI principles of teaching, cognitive, and social presence, including: frequent, substantive faculty-student interaction; promotion of critical thinking; teacher immediacy; direct instruction; regular formative and summative feedback; correction of students’ misconceptions; in-depth assessments and evaluation: recommended enrollment of <math>\leq 20</math> students (small-medium)</li> </ol>
Bloom’s Taxonomy	<ol style="list-style-type: none"> <li>1. Lower levels: knowledge, comprehension</li> <li>2. Middle level: application</li> <li>3. Upper levels: analysis, synthesis, and evaluation</li> </ol>	<ol style="list-style-type: none"> <li>1. Medium-large: <math>\geq 30</math> students</li> <li>2. Medium: 16-40 students</li> <li>3. Small: <math>\leq 15</math> students</li> </ol>
Total: Conclusions on varying combinations of all three frameworks	<ol style="list-style-type: none"> <li>1. In combination, use of objectivist teaching strategies, limited implementation of the COI model, and lower levels of learning in Bloom’s taxonomy</li> <li>2. Varying combinations of middle levels of all three frameworks</li> <li>3. In combination, use of constructivist teaching strategies, full implementation of the COI model, and higher levels of learning in Bloom’s taxonomy</li> </ol>	<ol style="list-style-type: none"> <li>1. Large: <math>\geq 30</math> students</li> <li>2. Medium: 16-30 students</li> <li>3. Small: <math>\leq 15</math> students</li> </ol>

*Note:* The recommended course sizes are based on a synthesis of research findings from the literature review, and implications for teaching strategies from the three educational frameworks.

This further supports that there is no ‘one-size-fits-all’ class size that is appropriate for on-line and blended learning courses. Such sizes should be determined on a class-by-class basis.