

## **Achieving high-touch through high-tech: A strategic deployment of online technology to improve the educational experience and performance of minority students**

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**Abstract:** WTCC began preliminary testing of a new course delivery model designed to improve minority persistence and success in online classes. The “high-tech/high-touch model”, developed as part of a four-year *First in the World* grant, is a set of technologies and course management strategies designed to facilitate interaction in online classes and foster a sense of psychological presence among students and instructors. This new course delivery model includes the use of three technologies designed to increase interaction and familiarity between the student and the instructor, as well as a menu of course management activities designed to keep students engaged with their online coursework. During the summer 2016 semester, one business and one psychology instructor each used three “high-tech” tools (texting apps, online meeting rooms, and custom video content) to engage in “high-touch” student management practices in their online classes. Initial data comparing these two instructors to departmental baselines demonstrated a positive impact of this course delivery model on student perceptions and performance for both minority and non-minority students.

### **The minority gap in higher education**

Disparities in educational success between African American, Hispanic, and Native American students and their white and Asian counterparts is a recurring refrain at all levels of education (Scott Foundation for Public Education, 2010; Harper & Davis III, 2012). This same achievement discrepancy also exists in online education, with minority males in particular performing poorly in online classes compared to their counterparts (Jaggars & Xu, 2013) Research on minority achievement in higher education consistently suggests the importance of nutritive social interaction to the successful minority student (Harper, 2009b). When interviewed, these students list opportunities to build mentoring relationships with instructors and older students inside the classroom, improved access to social capital, and non-instructional activities that help combat self-defeating stereotypes and narratives as important to their success (Harper, 2009; Center for Community College Student Engagement, 2014). Other researchers have echoed this sentiment, citing the importance of social experiences to educational outcomes of minority students. In his 2008 paper, the researcher George D. Kuh writes “while participation in effective educational activities generally benefits all students, the salutary effects are even greater for students who begin college at lower achievement levels, as well as students of color, compared with white students” (19). However, the reasons that cause minority students to select online education are often the same reasons that prevent these students from attending campus-based events and using campus-based resources. This isolation that accompanies participation in a traditional online class may be even more challenging for the minority student.

## **High-touch through high-tech model: Improving minority performance**

In the summer of 2016, Wake Technical community college began preliminary testing of a new course delivery model developed as part of a four-year, U.S. Department of Education *First in the World* grant. Project C.O.M.P.A.S.S. (Creating Online Models to Promote Academic Success for Students) involves the development of an instructional model designed to create a sense of community among students and the instructor in an online course. This is an attempt to close the psychological distance that exists in the typical online course setting. Based on work by McInnerney & Roberts (2004), the high-touch through high-tech model is a set of technologies and course management strategies designed to facilitate interaction, communication, and a sense of community among students and instructors in an online course. While a sense of community is important for all students in online courses, it may be even more crucial for minority students (Kuh, 2008; Harper, 2012). The aim of project C.O.M.P.A.S.S. is to deploy, then measure the impact of this instructional model on short and long term student outcomes in non-Asian minorities with the ultimate goal of decreasing the minority achievement gap. Courses selected to test this model included Introductory Psychology (Psy 150), Introduction to Business (Bus 110), and Introduction to Computers (CIS 110), three classes at Wake Tech with historically high enrollment and low success rates.

This new course delivery model included the use of three technologies designed to increase interaction and familiarity between the student and the instructor, as well as a menu of proactive and reactive instructor course management activities to keep students engaged with their online coursework. The technologies included the use of a secure, phone-based texting app for more responsive communication between the instructor and students, online meeting room technology to hold interactive live-streamed classes and office hours where students and instructors could get to know one another through synchronous interaction, and custom video communications featuring the instructor to help personalize the instructor and the course for the students. Along with these “high tech” tools, the instructors engaged in a set of “high-touch” behaviors designed to keep students on track with their coursework. Some of these behaviors included contacting repeat students prior to the beginning of the semester, holding a synchronous orientation the first week of class, providing timely reminders for due dates, following up immediately with students missing work, answering emails within six hours, and other behaviors designed to increase the sense of the instructor’s presence in the class. The high-touch teaching protocol is included in the Appendix.

## **Summer pilot study**

Data collection for the grant was scheduled to begin in spring 2017 for Psychology 150 and Business 110, with CIS 110 data collection beginning fall 2017. It became apparent during the planning phase that this would be a complex undertaking. Registration alone required several departments to coordinate the typical registration and drop/add process with the random assignment of 1,800 students into more than 50 different sections. In preparation for the spring 2017 launch, two pilot studies were planned to allow the “stress testing” of the research design. The summer 2016 pilot study was designed to test the instructors’ ability to follow the protocol, as well as the researchers’ ability to demonstrate treatment fidelity, and collect data. Fall 2016 involved testing the organizational capability to coordinate the random assignment process with the campus registration procedures. The research team decided to take this opportunity to collect initial data on student performance and perception while testing other parts of the research design. Although students were not randomly assigned to course sections for the summer semester, it still seemed worthwhile to gather data in this quasi-experimental design.

## **Treatment Instructors, Participants, and Outcome Variables**

The high-touch through high-tech course delivery model was deployed during the 10-week summer session in one section each of online Psychology 150 and Business 110. After initial training, two instructors (one for Psychology 150 and one for Business 110) taught their summer school classes following the “high touch” protocol

listed in the appendix. The sample included 351 students ( $N = 155$  for Psychology 150;  $N = 196$  for Business 110) in 10 sections participated in this study, with 86 students participating in the two treatment sections and 265 students in the 8 control sections. Initial analyses of the two student groups showed that students in the treatment and control conditions did not differ in cumulative GPA coming into the class,  $t(1,349) = .314$ ,  $p = .72$ . ( $M = 2.71$ ,  $SD = .97$  for treatment group;  $M = 2.76$ ,  $SD = 1.03$  for control group). For the purposes of this test, student race and ethnicity was coded into a two level variable, including non-Asian minorities ( $N = 128$ ) and non-minorities ( $N = 223$ ). Chi-squared analysis showed no significant difference between the treatment and the control group in the proportion of minority enrollment between the class types,  $X^2(2, N = 351) = 2.11$ ,  $p = .15$  (43% in treatment classes, 34% in control classes). Two outcomes were measured in this study; student grade in the class (on a 4-point scale), and student perceptions as measured by a 14-item end-of-course survey. The items in the course survey are presented in the table below.

## Results

### *Student perceptions*

Two-hundred fourteen students completed the end of course survey (response rate of 61%) during the last few weeks of the course in which they endorsed their agreement with each item using a 4-point scale with responses ranging from “strongly agree” to “strongly disagree”. By and large, students endorsed mainly the top two responses on the scale (either “agree” or “strongly agree”), with the interesting break in the data appearing between those who strongly endorsed an item (rating of 4) and those that did not. For analysis purposes, each item was recoded into a dichotomous variable comparing those who strongly agreed with the item versus the other three responses. Chi-squared analyses performed on the student responses showed that, for 10 of the 14 items, treatment students were more likely to endorse “strongly agree” than students in the control classes. The survey items, student endorsement rates, and chi squared statistics are presented in the table below:

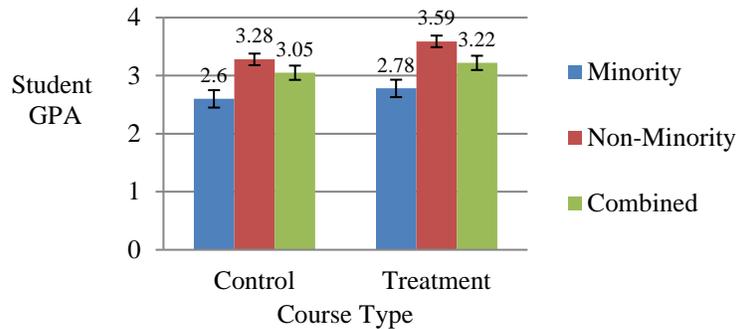
<b>Student perceptions of course shell design</b>	“SA” Treatment	“SA” Control	X <sup>2</sup>	p value
The learning objectives were clearly defined.	86%	68%	5.1	<b>.02*</b>
The assignment due dates were clearly defined.	81%	73%	1.1	.29
The expectations for class participation were clearly defined.	78%	70%	1.17	.28
Instructor clearly stated expectations for working with others.	81%	68%	1.1	.29
I was given instructions on how to get started in this class.	86%	62%	5.32	<b>.02*</b>
The menu made navigating this course easy.	86%	70%	4.25	<b>.04*</b>
I knew where to find my grades.	86%	73%	3.47	.06
The links in the class worked well.	92%	74%	5.72	<b>.02*</b>
<b>Student perceptions of “presence”</b>				
The instructor gave me timely, written feedback.	89%	71%	5.15	<b>.02*</b>
The instructor responded to my questions in a timely manner.	89%	63%	10.0	<b>.001**</b>
Interaction w/ instructor made me feel like I was not alone.	86%	66%	6.25	<b>.01*</b>
Instructor provided opportunities for interaction w/students.	84%	63%	6.04	<b>.01*</b>
Interaction w/ students made me feel like I was not alone.	81%	65%	3.7	<b>.05*</b>
There was more than one way to demonstrate my learning.	84%	61%	7.02	<b>.008**</b>

**p<.05; \*\* = p<.01**

**Table: Comparison of students strongly agreeing with online survey items (N=214)**

**Student grades**

Student grades were analyzed using analysis of variance (ANOVA) with class type (treatment or control), race (non-Asian minority or non-minority) course type (Psychology 150 or Business 110) as the predictor variables. Race was significant, with non-minorities having a higher course GPA ( $M = 3.35, SD = .97$ ) than non-Asian minorities ( $M = 2.65, SD = 1.03$ ),  $F(1,307) = 24.26, p < .0001$ . However, the expected interaction between teaching style and student type was not significant,  $F(1,307) = .19, p = .69$ . Also, class type did not significantly affect student GPA,  $F(1,307) = 2.7, p = .10$ . The mean comparisons for this interaction as well as the overall main effect for class type are presented in the figure below:



**Figure: Comparing Class GPA-Course type by student ethnicity**

While there was no difference in student GPA based on course type [ $F(1,307) = 2.25, p = .13$ ], the course by treatment interaction was significant,  $F(1,307) = 5.09, p = .03$ . Tukey tests indicated that, for Psychology 150, students in the treatment class had a higher GPA ( $M = 3.33, SD = 1.0$ ) than those in the control classes ( $M = 2.79, SD = 1.16$ ), ( $p < .05$ ). However, there was no difference in student GPA between the treatment ( $M = 3.16, SD = 1.15$ ) and control classes ( $M = 3.29, SD = 1.13$ ) in Business 110 ( $p > .05$ ). No other main effects or interactions were significant.

**Conclusion**

The data show a mixed picture. Student responses to the end-of-course survey showed significant improvements for treatment students compared to control students, especially on items related to feelings of the instructor’s presence. However, there was no evidence suggesting that the high-tech/high touch model benefitted minorities more than non-minorities. Though non-significant, GPA differences between control and treatment classes are suggestive of a benefit for all treatment students. Finally, there was a course type by treatment interaction showing relative improvement in treatment classes, but only for Psychology 150. There are two reasons why this may have occurred. One explanation is that the difference was caused by idiosyncratic differences between the two treatment instructors. While this is possible, a more likely reason, given the pattern of data, is a ceiling effect for the business department. Mean GPA for both the control and treatment sections of Business were both B+ (3.16 for treatment and 3.29 for control). There may have been no difference between the treatment and control group in Business 110 because there was simply nowhere to go. Summer student populations are often more academically advanced than students in the typical semester, so it would not be surprising to have a summer course with abnormally high grades.

This summer pilot “stress test” was initially designed only as a way to demonstrate the researchers’ capability to operationalize and measure the variables of interest for the spring 2017 start. Knowing this, the limitations of this pre-pilot “stress test” included the lack of random assignment of students into treatment and

control classes, and the lack of multiple treatment instructors. Although preliminary tests showed these two groups to be similar in demographic makeup and college GPA, it is quite possible that factors related to the students' choice of section may have contributed to their class performance and survey scores. Furthermore, each treatment condition contained one treatment instructor, so it is impossible to disentangle and treatment effects with idiosyncratic effects of individual instructors. Therefore, any conclusions should be treated with caution. That being said, one might conclude from the survey data that there is *something* different going on in the two treatment classes and that this *something* is more pronounced with regard to perceptions of the instructor, rather than the course shell.

### **Fall 2016 pilot study improvements**

One final pilot study is planned for fall 2016 involving only Psychology 150 that will incorporate three improvements prior to the official study, beginning in the spring 2016 semester. First, the random assignment process will be tested for the fall 2016 Psychology 150 classes, with over 500 students being randomly assigned into 22 sections of online psychology in August. Due to the enormity of this task, the random assignment process and therefore the second pilot study will be limited to psychology students only. This improvement to internal validity will allow for a more confident interpretation of the data collected. Second, students will complete the Community of Inquiry questionnaire in early November. The Community of Inquiry model is an attempt to understand the dynamic processes that impact the development of online educational communities (Garrison, Anderson, and Archer, 2000; Swan et al., 2008), and this instrument measures three types of dynamic presence that are said to impact the learning process; instructor presence, social presence, and cognitive presence. In the analyses following the conclusion of the fall semester, researchers will assess whether there are differences between the treatment and control classes in the types of presence perceived, and whether or not these differences mediate any student outcomes. Finally, three instructors will be using the "high-touch through high-tech" protocol in their psychology courses, which will minimize the threat of idiosyncratic teaching differences affecting the data. With improved internal validity, a conceptually rich questionnaire, and three trained treatment instructors teaching eight sections, the researchers look forward to a second, stronger test of this model during the fall 2016 semester.

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## Appendix High-Touch/High-Tech Teaching Protocol

- 1) Instructors will use Adobe Connect meeting technology to communicate with their students.  
Provide an orientation within 3 days of course start date; Hold voluntary live-streamed weekly student gatherings (16 total); Live stream two office hours per week for students who need to attend remotely.
- 2) Instructors will use a texting technology (Remind, Regroup, etc.) to communicate with their classes.  
Engage students in live text chats for interventions (see below) or when initiated by the student.
- 3) Instructors will create custom video content.  
Creation and deployment of an orientation video, Creation and deployment of weekly “announcement” videos (14 total).
- 4) *At their discretion*, instructors may use the discussion board/forum to support collaborative inquiry and problem-solving.
- 5) Instructors will design classes that minimize barriers to minority students.  
Demonstrate inclusiveness by including minority images and topics that emphasize multicultural topics where possible in the class; Include at least one major assignment with a multicultural component that demonstrates the importance of cultural awareness; Emphasis on minority leaders in the field (ie. psychologists, minority businesses); Host at least one online event with a minority speaker from campus during the semester.
- 6) Instructors will demonstrate a proactive communication style.  
Send due date reminders for all graded assignments, using any of the following tools: texts, emails, Blackboard announcements; Send one affirmational announcement/email broadcast to class every week; Demonstrate high responsiveness by responding to all email/texts within 6 hours (during the hours of 8am - 8pm), six days a week.
- 7) Instructors will engage in proactive *intervention* strategies designed to identify and mentor students *before* they get in trouble.  
Contact students repeating the class prior to the beginning of the semester to offer assistance; Weekly email/text follow-up with students who miss work during the previous week; Attempt to contact students who do not log into blackboard for 7 days to offer help, using the student’s listed phone number.