Project COMPASS—Using a rigorous evaluation to change how a community college looks at their programs

A symposium proposal for the Society of Research on Educational Effectiveness

Symposium Organizer and Session Chair: Julie A. Edmunds, University of North Carolina at Greensboro

Symposium Discussant: Michael J. Weiss, MDRC

Symposium Overview: A project evaluation can serve as the first step in creating research partnerships between universities and policymakers/practitioners. This symposium describes how researchers from a university worked with staff from a community college to plan and implement a randomized-controlled trial of a project seeking to redesign the delivery of online courses. Not only is the evaluation providing useful information about the impact of the program, but implementation of the evaluation design is also leading the community college staff to think differently about how to assess other internal improvement efforts.

The symposium chair will provide an overview of the entire project, which is funded by a First in the World grant, and the roles played by the different organizations. This will include a brief discussion of the impetus for the joint work and how the different groups interact with each other.

The first paper, presented by a member of the community college team, will describe Project COMPASS and the strategies being used. The author will also describe the creation of measures to assess fidelity of implementation and how those measures have assisted in clarifying how instructors are expected to implement the project strategies.

The second paper, presented by a member of the university research team, will present an overview of the randomized controlled trial design and results from the first semester of full implementation. The paper will present the impact of the project on the percentage of students successfully completing the courses.

The third and final paper, presented by community college staff, will describe lessons learned about implementation of an experimental study and about working with researchers. The paper will also discuss how the community college is applying lessons learned about conducting RCTs and about the program more broadly within their college community.

The discussant, a researcher who works regularly with community colleges and also focuses on the quality of experimental studies, will reflect on implementing RCTs in community colleges and will also comment on how institutions can incorporate more data-based decision-making into their ongoing practice.

<u>Paper 1: The Implementation of Project COMPASS</u>

Christopher Roddenberry and Thomas Rankin, Wake Technical Community College

<u>Background:</u> Project COMPASS is a development project funded under the U.S. Department of Education's First in the World competition. The goals of the project are to increase the number of students, particularly students of color, completing online courses and improve the academic performance of those students, with the ultimate goal of increasing the percentage of students who remain in postsecondary education. The project plans to achieve these outcomes by redesigning the delivery of a core set of online courses so that they incorporate a variety of technologies and strategies that increase the quality of the online learning experience.

<u>Objective:</u> This paper describes the implementation of the project and the approach used to measure fidelity of implementation.

<u>Setting:</u> This project is being implemented at Wake Technical Community College in North Carolina.

<u>Sample:</u> The target population is students participating in a core set of online courses that are taken as introductory courses by many students, including Psychology (PSY) 150, Business (BUS) 110, and Computer and Information Science (CIS) 110. The project has a particular emphasis on students of color, defined as those who identify as Black, Hispanic, Native American, or Multiracial. For the study, students are randomly assigned either to classes taught by instructors trained in the Project COMPASS protocol or to classes taught by non-trained instructors.

<u>Program:</u> Project COMPASS is structured around the Community of Inquiry (COI), a conceptual framework for online instruction. The COI framework identifies three core components of the online experience: 1) teaching presence, 2) social presence, and 3) cognitive presence (Arbaugh, 2007; Garrison, Anderson, & Archer, 2001). Project COMPASS hopes to increase these various types of online presence by incorporating a set of "High Tech" and "High Touch" practices. High Tech practices involve the use of a key set of technologies such as web conferencing, web messaging with automated features, video presentations, video chat, and desktop sharing. As part of the project, instructors will be trained in the use of these technologies and in the use of High Touch strategies that are designed to improve student-teacher interactions as well as strategies designed specifically to support minority and other at-risk students. Figure 1 provides an overview of the project components and the expected outcomes.

FIGURE 1 HERE

The grant was received in fall of 2015. The strategies were developed in the spring and fall of 2016. In the spring of 2017, the intervention was piloted in two courses, PSY 150 and BUS 110. In the fall of 2017, the intervention was implemented at the full level in those two courses. The course will be piloted in the spring of 2018 in the CIS course.

Research Design: To assess implementation of the instructor activities (Column 2 of the logic model), the project staff worked with the evaluation team to develop a Fidelity of Implementation (FOI) matrix. The FOI matrix identifies specific indicators for each of the core High Tech and High Touch strategies. The project staff also developed initial target levels of implementation for the indicators.
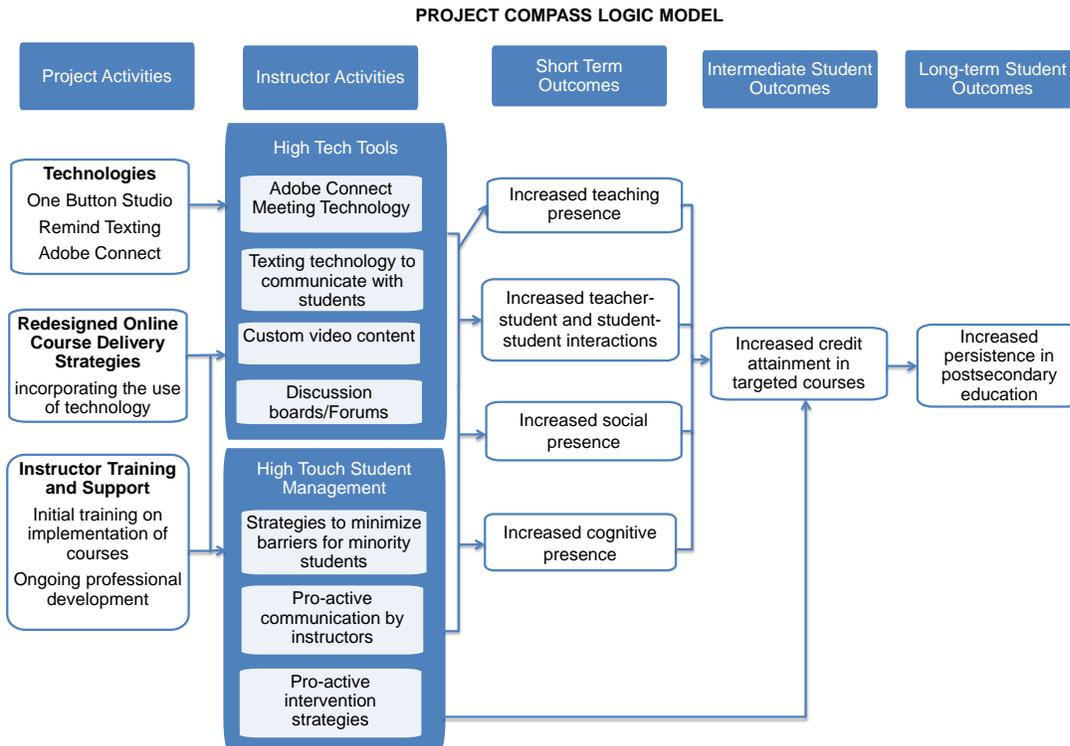
Data Collection and Analysis: In the pilot program implementation, data were collected only from treatment instructors using a variety of sources, including review of materials on Blackboard, texting technologies, and interviews with participating staff. The staff is in the process of identifying measures that could easily be collected on both treatment and control teachers, even if not all indicators would be represented in that data collection.

The team is also developing a FOI matrix for the implementation supports, the activities in the first column of the logic model.

Results: Analysis of data on the FOI indicators indicated that the majority of instructors were implementing the project strategies at the targeted levels. For example, all instructors were contacting struggling students at the targeted levels. After implementation of the pilot, the team modified the levels of some indicators to accommodate lessons learned. For example, the expectation for the number of videos was reduced because students indicated that they did not necessarily need the support the videos provided later in the semester. There were also several indicators for which the project staff had not completely articulated the targeted levels of implementation. The team is in the process of identifying those measures.

Conclusions: Creation of a FOI matrix provided a structure that required the community college staff to clearly articulate the expectations for the intervention. The staff were then able to use the matrix to create a detailed implementation guide for the project. Wake Tech staff are in the planning stages of other projects that will implement aspects of this teaching model. One particular beneficiary of the Project COMPASS work is expected to be the "Online College", a project to redesign Wake Tech's online educational model to integrate best practices available in online education into a systematic process. The staff are discussing standards of implementation in the "Online College" committee, and are expected to incorporate the concept of "Fidelity of Intervention" to distinguish the Online College teacher from a regular online teacher.

Figure 1: Project COMPASS Logic Model

PROJECT COMPASS LOGIC MODEL

Project Activities	Instructor Activities	Short Term Outcomes	Intermediate Student Outcomes	Long-term Student Outcomes

Technologies
One Button Studio
Remind Texting
Adobe Connect

Redesigned Online Course Delivery Strategies
incorporating the use of technology

Instructor Training and Support
Initial training on implementation of courses
Ongoing professional development

High Tech Tools
- Adobe Connect Meeting Technology
- Texting technology to communicate with students
- Custom video content
- Discussion boards/Forums

High Touch Student Management
- Strategies to minimize barriers for minority students
- Pro-active communication by instructors
- Pro-active intervention strategies

Increased teaching presence

Increased teacher-student and student-student interactions

Increased social presence

Increased cognitive presence

Increased credit attainment in targeted courses

Increased persistence in postsecondary education

Paper 2: The Impact of Project COMPASS

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Background: Although Project COMPASS is a development project, the project is utilizing a randomized controlled trial to assess the impacts of the intervention. The RCT was conducted during the pilot phase of the intervention to allow for piloting of the RCT approach as well as to assess early impacts of the intervention. A RCT is then being conducted on two semesters' worth of implementation of the fully developed intervention. This proposal presents results from the pilot implementation of the project; these findings will be updated with results from the first semester of full implementation that is occurring in the fall of 2017.

Objective: This paper presents results for the following key research questions:

1. What is the impact of students' taking at least one redesigned online course on the percentage of students completing the course successfully (with a grade of A, B or C) when compared to traditional online courses? What is the impact for minority students?
2. What is the impact of students' taking at least one redesigned online course on the percentage of students withdrawing from the course when compared to traditional online courses? What is the impact for minority students?
3. Do the redesigned courses have an increased social, teaching, and cognitive presence when compared to the traditional online courses?

Research Design: The research design utilizes a RCT in which students were randomly assigned to classes taught by treatment instructors or to classes taught by control instructors.

 Setting: This project is being implemented at Wake Technical Community College in North Carolina.

Sample: In the pilot implementation, the sample for the first two research questions included 503 students who enrolled in Psych 150 and 455 students who enrolled in Business 110, all of whom were randomly assigned to treatment or control. There were 23 students who enrolled in both classes, thus, the number of unique students included in the study was 935. All cross-enrolled students had the same assignment in all classes. The study used an Intent-to-Treat approach, such that all students remained in their originally assigned group. After random assignment, one of the control sections in Psychology was re-assigned to be taught by a treatment instructor. For purposes of the primary analyses, this section remained in its original assignment under the control group and the results for the students in that section were analyzed as part of the control group. There are also alternative estimation results in which the re-assigned students were analyzed as part of the treatment group.

The sample for the third research question was 149 treatment students and 198 control students who responded to a survey (see measures) and provided a valid email address that allowed us to link to their administrative data. Because attrition rates exceeded WWC guidance, we examined the baseline equivalence of these two groups on demographic characteristics, PELL eligibility and GPA at the start of the semester. The groups were shown to be equivalent (see Table 1).

Program: As described above, Project COMPASS is an effort to redesign the delivery of online courses in a core set of courses through a set of High Tech and High Touch strategies.

Data Collection and Analysis: Data for the first two research questions came from administrative data collected by Wake Tech as part of their normal processes. The specific outcomes examined included:

- Successful completion of the targeted course. This was defined as completion of the course with a grade of an A, B, or C. Students who completed the course with grades of a D or F or who withdrew or dropped the course after enrolling were considered as not successfully completing the course.
- Withdrawal from the course. This measure captured students not completing the course at all and was defined as students never attending, withdrawing, or dropping the course after enrollment. In the pilot study, this sample also included students who were randomly assigned but dropped for non-payment of tuition or fees.

For the third research question, we administered the Community of Inquiry Survey (Arbaugh et al., 2008) to all students in treatment and control classes. The survey included scales related to social, cognitive, and teaching presence.

The impact analyses were conducted using a multi-level model with students clustered by instructor. At the student-level, we incorporated the following covariates: 1) indicators for gender, race, and ethnicity; 2) age and age squared; 3) indicator for disability; 4) indicator for PELL eligibility; 5) a measure of achievement; and 6) the odds of being selected into the treatment group. We also included an indicator for subject (psychology or business). We incorporated random effects at the instructor-level to account for the clustering.

Results: Under the Intent-to-Treat analyses, there were no statistically significant differences between treatment and control groups on any outcomes for any of the groups (Table 2). When we conducted supplementary analyses placing the re-assigned section into the treatment group and removing students dropped from non-payment prior to the course beginning (students who were excluded from the random assignment process in the fall), results showed a statistically significant, positive impact on minority students' successful completion of courses.

Survey findings showed positive, but non-significant impacts, on the different online presences (Table 3).

<u>Conclusions:</u> Conducting an RCT during the pilot phase allowed us to identify potentially problematic issues with implementation of the study design that could be corrected during the full implementation phase. The initial RCT findings also provided feedback on the impact that program staff could address as they attempted to enhance the program.

Table1: Baseline Characteristics for Survey Sample

Characteristic	Overall		
	Treatment Mean (N)	Control Mean (N)	Effect Size (SD)
% Female	69.8% (149)	67.2% (198)	0.056 (0.466)
% Hispanic	10.1% (149)	11.1% (198)	0.032 (0.309)
% Black	28.9% (149)	27.3% (198)	0.036 (0.449)
% White or Asian	54.4% (149)	58.1% (198)	0.075 (0.496)
Age	25.81 (149)	27.31 (198)	0.161 (9.334)
% Identified as disabled	1.3% (149)	1% (198)	0.028 (0.107)
% Pell Eligible	53% (149)	44.9% (198)	0.162 (0.5)
GPA at start of semester	2.43 (111)	2.47 (147)	0.037 (1.12)

Table 2: Program Impacts, Intent-to-Treat

Population	Outcome	Treatment group		Control group		ITT Estimated effects	
		Adjusted Mean	Standard Deviation	Mean	Standard Deviation	Adjusted Mean Difference	p-value
All Students N(T) = 326; N(C) = 632	% Completing the course with C or higher	**51.8%**	0.501	**51.4%**	0.5	**0.4%**	[0.8928]
	% Dropped or Withdrew	**37.9%**	0.489	**36.6%**	0.482	**1.3%**	[0.6633]
Minority Students N(T) = 164 N(C) = 293	% Completing the course with C or higher	**40.6%**	0.498	**38.2%**	0.487	**2.4%**	[0.7161]
	% Dropped or Withdrew	**46.3%**	0.499	**44.7%**	0.498	**1.6%**	[0.7782]
White and Asian	% Completing the course with C or	**59.1%**	0.498	**63.5%**	0.482	**-4.4%**	[0.4005]

| Population | Outcome | Treatment group | | Control group | | ITT Estimated effects | |
		Adjusted Mean	Standard Deviation	Mean	Standard Deviation	Adjusted Mean Difference	p-value
Students N(T) = 155 N(C) = 318	higher						
	% Dropped or Withdrew	**33.0%**	0.478	**28.3%**	0.451	**4.7%**	[0.1287]

Note: The adjusted treatment mean is calculated by adding the impact estimate to the unadjusted control mean.

Table 3: Program Impacts, Crossovers as Treatments and Excluding No-Shows

| Population | Outcome | Treatment group | | Control group | | Estimated effects | |
		Adjusted Mean	Standard Deviation	Mean	Standard Deviation	Adjusted Mean Difference	p-value
All Students N(T) = 312 N(C) = 549	% Completing the course with C or higher	**61.4%**	0.494	**55.9%**	0.497	**5.5%**	[0.2912]
	% Dropped or Withdrew	**26.3%**	0.458	**30.8%**	0.462	**-4.5%**	[0.3362]
Minority Students N(T) = 151 N(C) = 248	% Completing the course with C or higher	**53.3%**	0.5	**41.5%**	0.494	**11.8%***	[0.0315]
	% Dropped or Withdrew	**32.7%**	0.472	**38.7%**	0.488	**-6.0%**	[0.2476]
White and Asian Students N(T) = 153 N(C) = 283	% Completing the course with C or higher	**66.7%**	0.485	**68.2%**	0.467	**-1.5%**	[0.8250]
	% Dropped or Withdrew	**22.6%**	0.444	**23.3%**	0.424	**-0.7%**	[0.9055]

*Significant at p≤.05. Note: The adjusted treatment mean is calculated by adding the impact estimate to the unadjusted control mean.

Table 4: Community of Inquiry Scales

| Scale | Intervention Group (n=149) | | Comparison Group (n=198) | | Estimated Effects | | |
	Adjusted Mean	Standard Deviation	Mean	Standard Deviation	Adjusted Mean Difference	Effect Sizes (Hedge's *g*)	p-value
Teaching presence	**4.41**	0.76	**4.41**	0.77	0.002	**0.045**	[0.986]
Social presence	**4.19**	0.73	**4.05**	0.85	0.139	**0.190**	[0.153]
Cognitive presence	**4.25**	0.68	**4.16**	0.75	0.087	**0.134**	[0.323]

Paper 3: Lessons Learned about and from Implementing an Experimental Study

Kai Wang and Bryan Ryan, Wake Technical Community College

Background: Project COMPASS represents one of the largest federal grants that Wake Tech Community College has ever received and the only project that has been assessed using an experimental design.

Objective: This paper describes lessons learned by the project staff about implementing an experimental study in a community college. It also describes how the study has influenced the community college's perceptions about examining the impact of other initiatives going on in the college.

Setting: This project is being implemented at Wake Technical Community College in North Carolina.

Program: Project COMPASS is one of a number of efforts being implemented by Wake Tech to improve what the college sees as unacceptably low levels of performance in online courses. Because Project COMPASS has substantial federal funding, it is being used as a guidepost for how Wake Tech can think about their other online courses.

Research Design: The study uses a randomized controlled trial in which students were randomly assigned to courses taught by treatment or control instructors. In addition to being used during the formal evaluation, the random assignment occurred two times prior to the start of the formal study. The first occurrence was during the fall of 2016, only with the Psychology courses. The purpose of this first test run was to see if random assignment was even feasible. The second random assignment was completed with both the Psychology and the Business courses during the pilot implementation of the course in the spring of 2017.

Results: Project staff learned several lessons concerning implementation of an experimental design. First, it was very helpful to do a "stress test" or test run of the random assignment before the study formally began. This allowed staff to test out the random assignment strategies and make modifications in a lower stakes environment. For example, in the stress test, the random assignment required students to sign up for one large open session with students being placed in smaller sections later. This was found to reduce overall course enrollment, as students were unwilling to sign up for a large session. Thus, the second round of randomization involved the use of dummy sections.

Second, it was important to involve key staff members who were connected to the student registration and assignment process (e.g., registrar's office, data analysts, department chairs) early in the process. An advisory committee that includes the key administrators was formed to help this process. This meant that it was less likely that someone would unwittingly modify the assignment process in such a way that it would invalidate the study design. For example, in the pilot experimental study, the Psychology Department Chair moved one section that had been

designated as control and re-assigned it to the lead treatment instructor. Department chairs were educated about the impact of decisions like this and the random assignment for the fall of 2018 occurred without any such challenges.

 Third, the timeline for course assignment was very rapid and it was important to have strong communication between the researchers doing the random assignment and the community college staff responsible for registering students.

Although the results from the pilot study were not as strong as the staff would have liked, they are utilizing the information gained from the pilot to strengthen and enhance the program. For example, they have developed clearer expectations for instructors who are implementing the program. This includes a detailed guide-book that describes the strategies and targeted levels of implementation.

Conclusions: Although implementation of an experimental study was a substantial amount of additional work and required close communication among multiple parties, the project staff believed that the process was useful and doable. Wake Tech staff are looking at other initiatives in which they can use an experimental design to look at impact.

References for all papers:

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