



Improving Online Learning in Community College Settings

The Impact Evaluation of Wake Tech's Project
COMPASS—Summary Report

Authors:

Julie A. Edmunds, Dora Gicheva, Beth Thrift, Marie Hull
University of North Carolina at Greensboro



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Introduction

Online courses are a growing component of the community college experience.¹ These courses are valued by students for their flexibility, allowing people to take courses on their own time and sometimes at their own pace. Online courses are also valued by institutions as a way to reduce costs. That said, research consistently shows that students perform worse in online courses than they do in traditional face-to-face courses.² For example, one study found successful completion of online courses was about 6-8 percentage points lower than in similar classes that were face-to-face.³ In addition to performing worse, students in online courses have lower grades in future courses and are less likely to remain enrolled at the university.⁴ Outcomes may be even poorer for minority students, low-income students, and students who are underprepared.⁵

Failing to complete courses successfully makes students less likely to persist and attain a degree, a problem that is particularly pressing at community colleges. The average graduation rate for first-time, degree-seeking students in community colleges is 30%,⁶ while the drop-out rate is even higher for minority students.⁷

Wake Technical Community College (Wake Tech), the largest community college in North Carolina, has experienced similar challenges. In 2013-14, only 62% of Wake Tech students who began core online courses successfully completed those courses. The results were substantially worse for students of color, who had success rates ranging from 46% to 50%. To address this issue, in 2015, Wake Tech received funding from the U.S. Department of Education's First in the World grant competition for Project COMPASS, an original effort to redesign the course delivery of a core set of online courses.

Project COMPASS used a series of technology-enhanced strategies (High-Tech Strategies) coupled with strategies to support increased interactions, with a particular focus on minority students (High-Touch Strategies), to improve students' experiences in the online setting. The model was implemented in three popular introductory gateway courses that have historically had lower-than-desired outcomes.

Want to know more about this study?

This brief provides a summary of key findings from the external evaluation of Wake Tech's Project COMPASS. More detail on the study methodology and on findings relative to project implementation and impacts can be found in the accompanying technical report.

¹ Lokken, 2017

² Hart, Friedmann, & Hill, 2018; Jaggars, 2011; Xu & Jaggars, 2011

³ Hart et al., 2018

⁴ Bettinger et al., 2017

⁵ Jaggars, 2011

⁶ National Center for Education Statistics, 2018

⁷ Radford, Berkner, Wheelless, & Shepherd, 2010

The Project COMPASS Model

The goals of Project COMPASS were to 1) increase the number of students, particularly students of color, completing online courses; 2) improve the academic performance of those students; and 3) increase the percentage of students who persist in postsecondary education. The project planned to achieve these outcomes by redesigning the delivery of a core set of online courses so that they incorporated a variety of technologies and strategies that increased the quality of the online learning experience.

The strategies were structured around the Community of Inquiry conceptual framework that identifies three core components of the online experience⁸:

- 1) **social presence**, or the degree to which online participants are connected to each other. The project sought to improve the interaction between instructors and students as well as among students themselves.
- 2) **cognitive presence**, or the extent to which students are actively engaged in learning communities. In the project, this presence was expected to be enhanced by the types of questions instructors ask and the types of activities in which students engage.
- 3) **teaching presence**, or the kind of presence an instructor demonstrates in an online community. Instructors with strong teaching presence are those who post frequently, actively remind students of deadlines, invite questions, respond quickly to students, and solicit and incorporate feedback.

The intent of Project COMPASS was to increase these various types of online presences by incorporating a set of “High-Tech Tools” and “High-Touch Strategies.” High-Tech Tools involved the use of a key set of technologies (e.g., web conferencing, web messaging with automated features, video presentations, video chat, and desktop sharing). High-Touch Strategies included 1) strategies designed specifically to support minority students, such as including minority images and emphasizing minority leaders; 2) a proactive communication style that involved letting students know about upcoming assignments, sending affirmational announcements, and being responsive to students; and 3) proactive intervention strategies such as following up with students who miss work or do not log into Blackboard.

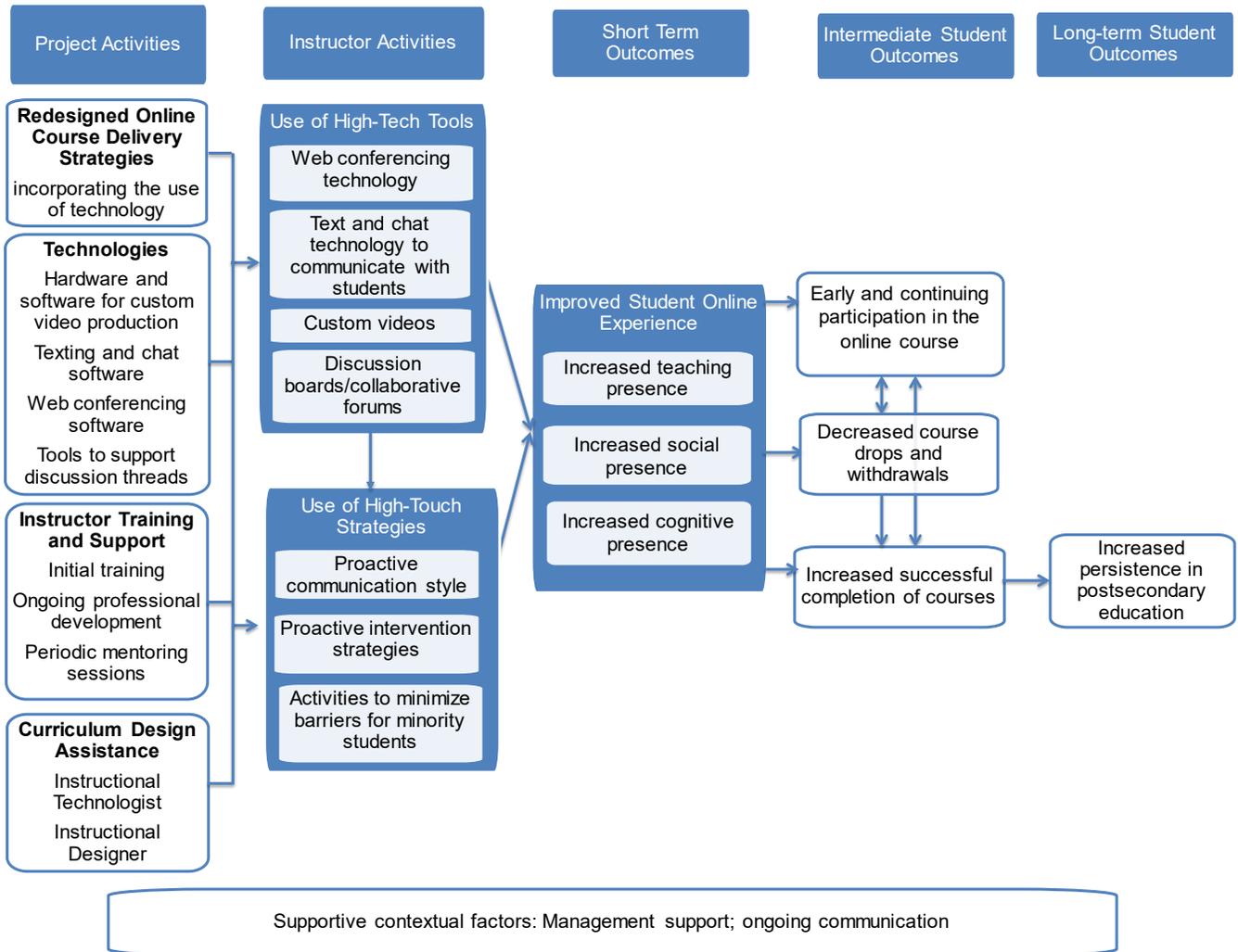
Wake Tech also developed a series of supports to assist instructors in implementing the High-Tech Tools and High-Touch Strategies. Wake Tech purchased, and made available, key technology tools, including a video production studio, texting technology, online webinar software, and laptops. They also hired an instructional designer, an instructional technologist, and a media production assistant to work with the teachers on effectively embedding technology into their online classes. The lead instructors created a handbook that delineated

⁸ Arbaugh, 2007; Garrison, Anderson, & Archer, 2001

the project strategies and expectations for their implementation, and there were ongoing professional development activities provided to the instructors.

These supports were designed to increase teachers' use of the High-Tech Tools and High-Touch Strategies, which were then intended to change the way students experience the online course (i.e., increase the three presences), thereby improving students' performance in class, and ultimately, their retention in school. This conceptual framework is represented in Figure 1, the Project COMPASS logic model.

Figure 1. Project COMPASS Logic Model



Evaluation Methodology

Project COMPASS was assessed through an external evaluation, conducted by a team from the University of North Carolina at Greensboro. The evaluation was designed to examine the impact of the project on targeted outcomes and to explore implementation of the instructional practices. The intervention was implemented in three courses over two years: an introductory Business course and an introductory Psychology course in the fall of 2017 and the spring of 2018 and in an introductory Information Technology (IT) course in the fall of 2018 and the spring of 2019.

The primary impact study was conducted using a randomized controlled trial in which students who enrolled in one of the targeted online courses were randomly assigned to either a section taught by an instructor trained in Project COMPASS instructional strategies (i.e., the “treatment” group) or to a section taught by an instructor who had not been trained in the Project COMPASS instructional strategies (the “control” group). The instructors in the control group taught their course sections just as they normally would (see Figure 2).

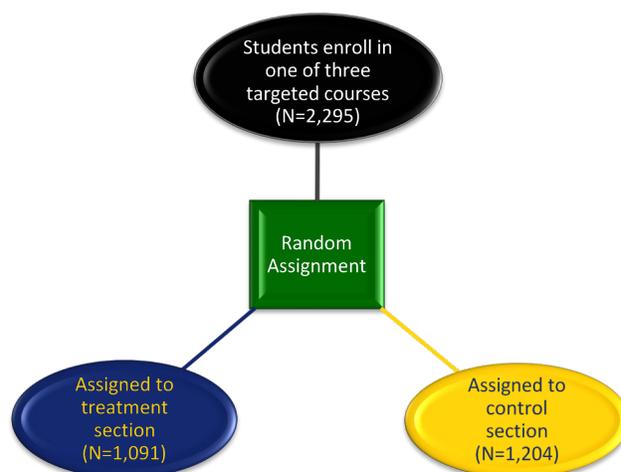
We looked at the following outcomes (see Figure 1, Column 4 in the logic model): 1) percentage of students completing the course with a C or higher, 2) percentage completing the course with a D or higher, 3)

percentage dropping or withdrawing from the course, and 4) percentage persisting into the next year of postsecondary education. (The persistence sample was smaller as it only included data for the two courses implemented in the 2017-18 school year.) Analyses were run as a multi-level model in order to account for the fact that students were clustered within sections.

The study also examined the extent to which Project COMPASS impacted students’ experience of the three online presences (Figure 1, Column 3 in the logic model). We administered the Community of Inquiry Survey⁹ to students in both the treatment and control groups. Although there were very different response rates between treatment and control sections, the two samples were similar on baseline demographic characteristics. We conducted the same analyses as described for the student outcomes.

To explore changes that Project COMPASS might be having on instructional strategies (Figure 1, Column 2 in the logic model), the evaluation team conducted retrospective observations of

Figure 2. Study Design



⁹ Arbaugh, 2008

instructors' online classes and identified the frequency of implementation of targeted instructional practices. The observations generated observation scores for each instructor that were then linked to student outcomes through regression analyses.

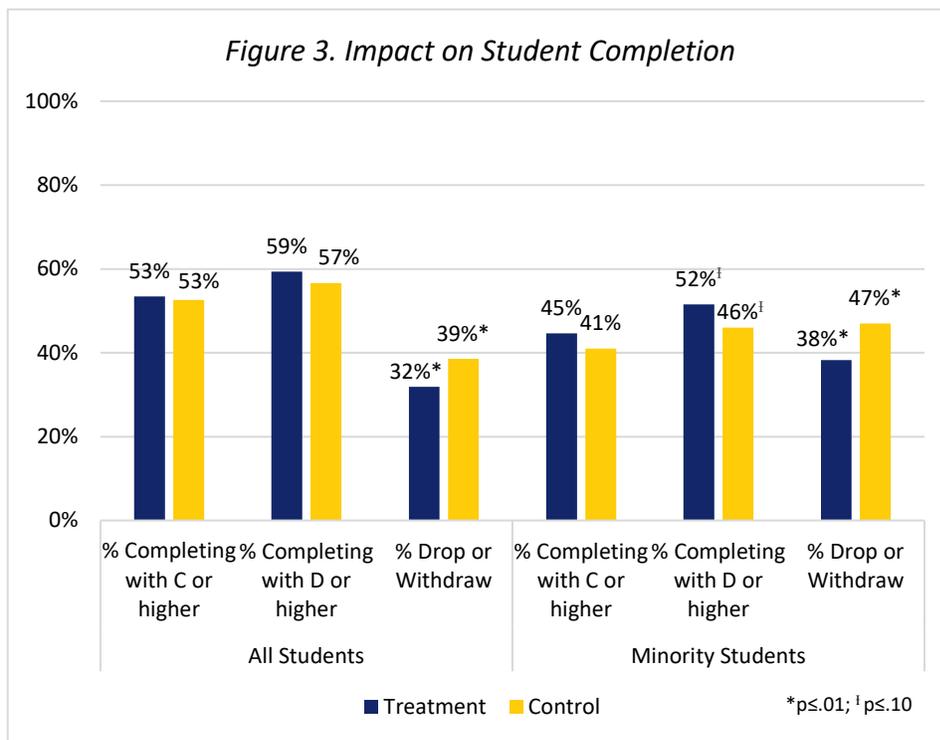
As we explored implementation, we also discovered that Wake Tech was making institutional changes as a result of participation in this project. We documented these changes through interviews and review of documents.

Impact on Student Outcomes

Implementation of the Project COMPASS strategies was intended to lead to improved student outcomes. These potential impacts were assessed through the randomized controlled trial; we compared results for students randomly assigned to treatment sections (taught by instructors trained in the Project COMPASS strategies) with the results for students randomly assigned to the control sections (instructors who were not trained in the Project COMPASS strategies).

Finding: Treatment students were less likely to drop or withdraw from the course.

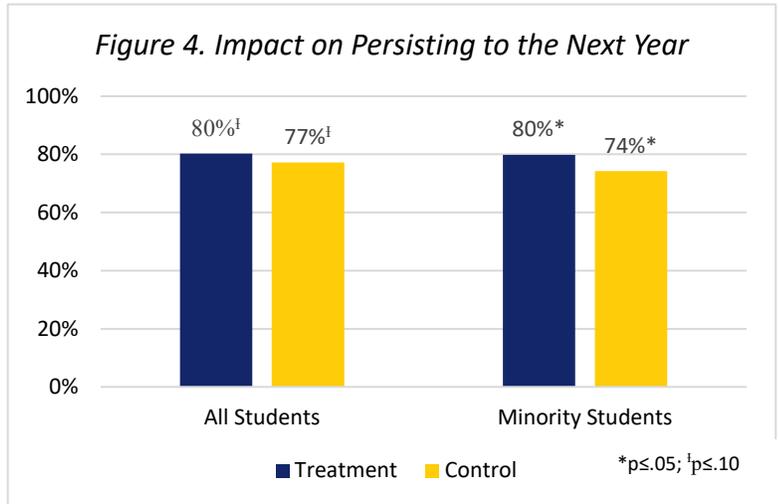
Regarding program impacts on student completion, the evaluation looked at the percentage of students who: 1) dropped or withdrew from the course, 2) completed the course with a C or higher (which would earn students credit transferable to a four-year institution), and 3) completed the course with a D or higher (which could move students toward a two-year degree or credential). Results are presented for the overall population and for minority students, the population of primary emphasis in this grant.



As Figure 3 shows, treatment students were statistically significantly less likely to drop or withdraw ($p \leq .01$) compared to those in the control group. Further, minority students were more likely to complete the course with a D or higher ($p \leq .10$) in the treatment group compared to the control.

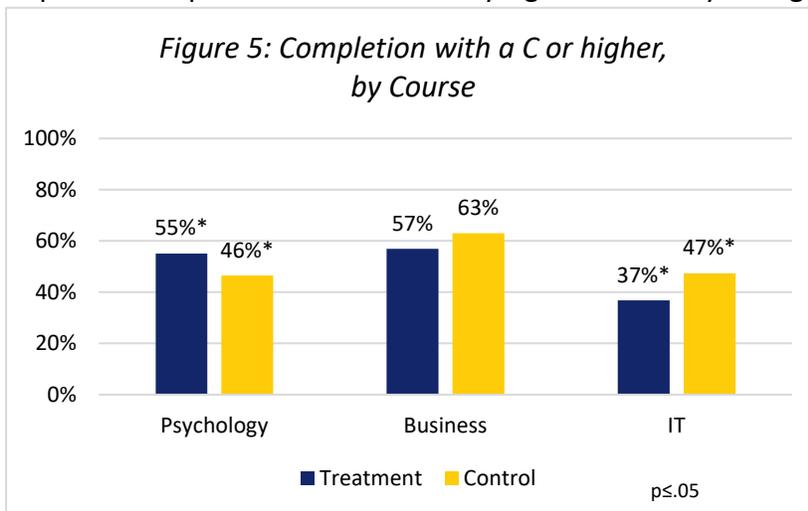
Finding: Treatment students were more likely to persist to the next year.

When we looked at the impact of the project on persisting in postsecondary education to the next year, we found that treatment students were more likely to persist to the next year (see Figure 4) compared to control students. The impact was larger for minority students.



Finding: Impacts differed by course.

We also looked at program impact by course and found extreme variation in the results. Impacts were positive and statistically significant in Psychology; however, in Business, there

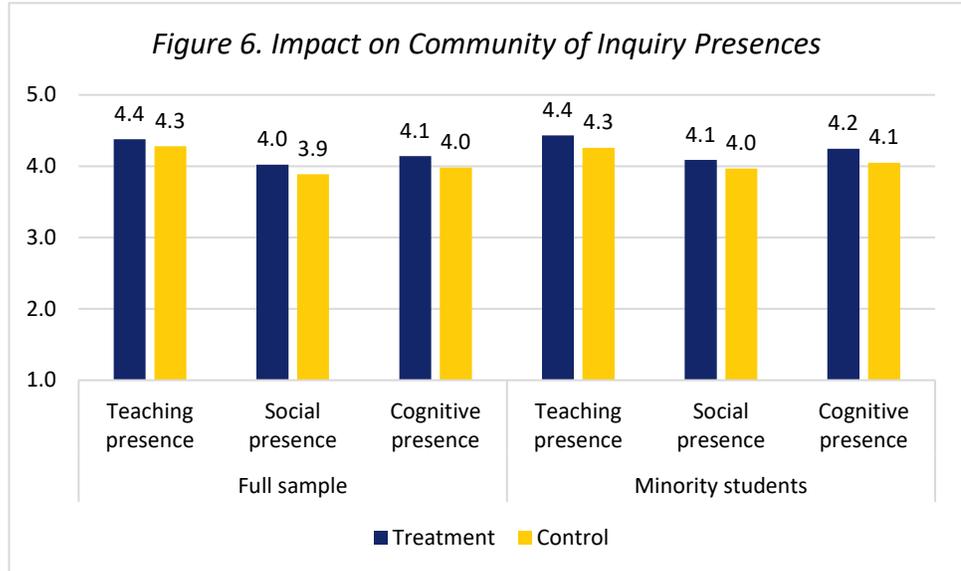


were *no* significant impacts, and in the Information Technology course, impacts were significantly *negative*. It is possible that these results were partially driven by the effectiveness of individual instructors; alternately, it could be that the Project COMPASS strategies need to be conceptualized differently in different subject areas.

Finding: There was no overall significant impact on students' experiences of the online presences, although impacts did differ by course.

Implementation of the Project COMPASS strategies was expected to change students' online experiences, increasing the quality of the three online presences identified in the Community of Inquiry Framework.

When we looked across the full sample and then the minority student sample, the results for the treatment group were descriptively higher than those for the control group, but none of the differences were statistically



significant. On the other hand, when we looked at differences by course, we saw strong positive impacts in Psychology, a positive impact in Business for cognitive presence, and null impacts on the other two presences in Business, and null impacts on all three presences in IT.

Impact on Instructional Strategies

In order to further explore the variation in impacts that were occurring by course, we conducted retrospective observations of the three different courses (over a sample of weeks) taught by each treatment instructor and each control instructor. The goal was to look at the extent to which the treatment instructors were implementing the Project COMPASS instructional strategies and if this could explain the impact differences we saw across courses. Each instructor was assigned an implementation score based on the extent to which they were implementing the targeted strategies.

Finding: Treatment instructors implemented most of the targeted strategies at higher levels than control instructors.

As Table 1 shows, for treatment instructors across all three subjects, we observed higher rates of implementation of the Project COMPASS protocol strategies as compared to the control instructors.

Table 1. Implementation of Instructional Strategies, by Subject

Protocol Strategies	Psychology		Business		IT	
	Treatment	Control	Treatment	Control	Treatment	Control
Synchronous events	2.25	0.00	0.67	0.00	1.67	0.00
Announcements	2.00	1.29	2.22	1.13	2.00	0.56
Personalized videos	1.75	0.00	1.83	0.00	2.17	0.56
Reducing Barriers	0.38	0.00	0.50	0.31	0.00	0.06
Threaded discussions	2.25	2.63	2.00	2.25	2.00	1.38
Total Implementation Score	1.73	0.78	1.44	0.74	1.57	0.51

Finding: Higher levels of implementation of the strategies were associated with better student outcomes.

The observation findings did not necessarily explain the differences in impact across courses. Yet, it was important for Wake Tech to understand if the project’s instructional strategies were effective. Given that the Project COMPASS strategies could be implemented by any instructor, even if they were not part of the intervention, we decided to explore whether higher levels of implementation of specific strategies were associated with better outcomes. As Table 2 shows, higher levels of implementation of most of the instructional strategies were, in fact, associated with reduced drops and withdrawals. Three of the strategies had a positive association with successful completion of the course, with one of the most positive impacts shown as a result of increased use of strategies designed to reduce barriers for minority students. One strategy, threaded discussions, was not associated with positive impacts in our sample; we believe that this is because threaded discussions were generally implemented at the same levels across most of the instructors.

Table 2. Relationship Between Instructional Strategies and Student Impacts

Implementation Measure	Impact on Drops and Withdrawals	Impact on Completing the Course with C or Higher
Total Observation Score	-7.88%**	5.82%*
Synchronous	-3.33%**	1.76%
Announcements	-2.41%	3.28%
Video	-4.48%**	2.73%*
Reducing Barriers	-7.18%*	11.00%**
Threaded Discussions	0.21%	-1.95%

*p≤.05, **p≤.001

Institutional Impacts

As the previous sections described, Project COMPASS had positive impacts on student outcomes, particularly for minority students. In interviews, meetings, and papers, the project staff agreed that the project has also had a substantial impact on Wake Tech as an institution.

Finding: Wake Tech is using findings from Project COMPASS to improve their online instruction.

Wake Tech's Online College Team is incorporating elements of the Project COMPASS protocol into materials that they are developing, and the project team is currently contemplating how to incorporate lessons learned, in a standardized way, across the institution. A senior staff member described how the project has helped the project team recognize the importance of identifying ways to embed effective practices into the design of online courses such that they can work regardless of the quality of the teacher. Additionally, two of the Project COMPASS lead instructors will be developing the next version of the High-Tech/High-Touch protocol, as well as the instructor training and implementation guide, which can then serve as a regular e-learning support training tool for Wake Tech online instructors interested in implementing the model.

Finding: Wake Tech staff have received national and international recognition because of Project COMPASS.

As a result of this project, Wake Tech staff have increased their visibility within the North Carolina Community College System as well as in the broader research and education community. The Wake Tech Project COMPASS staff have delivered 36 conference presentations, had 10 articles published in conference proceedings, and published eight journal articles. Project staff have also earned state, national, and international recognition for their work. One of the co-PIs was named North Carolina Community College System's 2018 Staff Person of the Year due to his innovative work, which included Project COMPASS. Additionally, three other Project COMPASS team members were awarded the Exemplary Course Award by Blackboard, Inc. for their work on a gamified Psychology course. The course was one of only 11 courses in the world to receive this distinction in 2018. As a further result of Project COMPASS, Wake Tech was also one of six organizations worldwide to receive a 2019 Blackboard Catalyst Award for Leading Change, and one of three institutions worldwide to receive the 2019 Ellucian Impact Award.

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Finding: Wake Tech has increased its emphasis on research and evidence.

Project staff report that they have increased their awareness of, and capacity to, engage in educational research as a result of Project COMPASS. The principal investigator noted that his division, which supports innovative projects throughout the college, now requires that programs conduct a formal evaluation of the impact of their work. Additionally, the college has started paying more attention to engaging in formative assessment and tracking fidelity of implementation so that they can implement any necessary mid-course corrections along the way.

Individual Wake Tech staff have also increased their internal capacity around evaluation and research. One of the project developers has expanded his research skills and will be taking on more of a research role within the college. For example, he was included as the researcher on a proposal the college submitted to the National Science Foundation. A senior staff member believed that the college has generally become more skilled in conducting research and data analyses:

“The other benefit of the work that we're doing [from] this project and others, we're now a lot savvier and honestly there are a lot of educational technology and other sort of agencies out there that are selling you resources and services, and I think we're in a much better position to evaluate whether we need that kind of help now that we've done some of those things.”

The implementation and dissemination of Project COMPASS has helped increase the interest in research at Wake Tech more broadly. To support this interest, the college has formed the Wake Tech Research Colloquium, which aims to create a collaborative, cross-disciplinary learning community that effectively supports the growth of a research culture and can assist in identifying research resources and opportunities across the college.

The project staff have also become more connected to the broader research community. For example, project staff and the evaluation team jointly presented at the 2018 and 2019 Annual Meetings for the Society for Research on Educational Effectiveness and at the 2019 Association for Education Finance and Policy.

Now that Wake Tech has experience with the design and processes required of rigorous experimental studies, has developed people who can use experimental design strategies, and has tools and partners who can help manage the needed processes, the college has a greater pool of possible initiatives and funding sources. Even before they have proven the effectiveness of the COMPASS interventions, and even if these interventions do not work, the COMPASS veterans are already looking for other research opportunities.

—Project COMPASS Principal Investigator

Conclusions

Over the course of the four-year First in the World grant period, Wake Tech developed and formally tested the Project COMPASS online course delivery protocol in three different foundational online courses. They created a handbook that described the specific strategies and set targeted levels of implementation for those strategies. They purchased specific technologies necessary to implement the project, held professional development sessions designed to support implementation, and hired support staff, including instructional designers and a video production assistant. Classroom observations showed that treatment instructors generally implemented the Project COMPASS strategies at higher levels than control instructors.

The impact study showed that, overall, treatment students were less likely to drop or withdraw than control students and more likely to persist in postsecondary education, although the results differed by course. This difference in impact appeared to be driven at times by individual instructors who were either more or less effective than other instructors.

Nevertheless, when looking at the connection between strategy implementation and student impacts, results showed that higher levels of implementation of the targeted strategies (regardless of whether someone was a treatment instructor or not) were associated with increased numbers of students successfully completing the course. This suggests that, overall, these strategies are worth implementing. As a result, Wake Tech is moving forward to embed these strategies in their online learning environments. Additionally, exploring how these strategies should look in different online courses will be an additional focus of the work moving forward.

One of the most substantial impacts from the program has been the change in culture at Wake Tech. Project COMPASS has served as an impetus for an increased focus on research and evaluation. For example, Wake Tech has participated in more research-oriented conferences and has established its own in-house research colloquium. Additionally, new projects at the college are expected to more formally track their implementation and impacts so that the college community can learn from all efforts, those that are successful and those that are not.

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