



Web Conferencing Supports the Wake Tech High School Equivalency Program

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Distance education enrollment has continued to increase for the last decade, growing even as overall enrollment in higher education has decreased [1]. The popularity of distance education is likely driven by the convenience and flexibility that it offers, especially to non-traditional students [2, 3, 4]. This unprecedented growth has led to a large body of research comparing student outcomes between online and face-to-face courses [5]. For the most part, research has shown online student outcomes to be comparable [6, 7, 8, 9]. However, there are still situations and groups for which online learning outcomes are not as good. Online students in community colleges, students in developmental classes, minority students, and students with poorer academic preparation often do not perform as well as their peers in face-to-face classes [10, 5].

This leaves administrators in a quandary as to how to grow their online offerings. One strategy might be to restrict distance education to situations where it has already demonstrated equivalency. However, this approach restricts the power and utility of distance education, and may place unfair limitations on students who need it most. Instead, what is needed is a more nuanced, evidence-based approach that develops and tests the efficacy of technology-supported distance education in as many academic settings as possible. Wake Technical Community College took this approach in the spring of 2018, deploying and evaluating an online model for HEP, a high school equivalency program serving a largely minority population.

The NC High School Equivalency Program

As part of their mission, community colleges often serve a diverse population of students who have different goals, abilities, and challenges. These students' interests are also diverse, as they may be interested in high school equivalency, college transfer, vocational, or remedial programs. The Wake Tech High School Equivalency Program (HEP), located in Raleigh, North Carolina, and funded by a grant of the U.S. Department of Education, assists migrant and seasonal farm workers and their immediate families in their pursuit of a high school equivalency diploma. Wake Tech HEP is the only program of its kind in North Carolina, and one of the largest of the 48 programs in the U.S., serving 125 students annually. Because of the demographics in the Raleigh, North Carolina, the great majority of HEP students are from Hispanic background.

There are two fundamental challenges to serving migrant students, both of which HEP online can address. First, migrant and seasonal farm workers in North Carolina often

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live in rural areas with few opportunities to access non-traditional education opportunities. Spread out throughout the 100 counties, many migrant students live too far from the only five physical class sites that HEP currently has available. Even for the students who are fortunate to live relatively close to a HEP class site, attending regular seated classes can be difficult because of demanding work schedules and family responsibilities, a problem common to Hispanic students [11]. The second problem is the very nature of their work. Migrant workers move from place to place as the seasons change and the need for their services change. For both of these reasons, it is difficult to offer face-to-face classes for the HEP program. Additionally, the dispersion of the student population leads to challenges for the HEP faculty. Until recently, HEP instructors were on the road three, four, and even five nights per week, every week, and traveling two hours in each direction to provide direct instruction. Each year, the HEP program spends thousands of dollars on transportation costs and time that faculty spent commuting to and from each class site. Finally, weather-related cancellations are especially challenging for faculty in this intensive, fast-paced academic format.

Using Adobe Connect to Support an Online HEP Course

Moving HEP to an online format has obvious advantages. However, the question remained as to whether or not the online model would be as successful in this *high risk* online setting that fits the profile situation where online education might not work as well as face to face. This was a developmental class, the student population was mostly Hispanic, and according to national survey data, poorly prepared, having completed on average 7th grade, all factors associated with comparatively poor performance for online students [12].

To support students in their pursuit of a high school diploma through a non-traditional program, HEP developed an online program supported with regular synchronous interaction using web conferencing software. Instructors held these classes using the Adobe Connect. Recent research has demonstrated the impact of synchronous interaction in improving online student performance, especially for minority students [10, 5]. Using web conferencing software to promote regular synchronous interaction between the Hispanic instructors and the students was consistent with best practices regarding minority success in online education [13, 14, 15]. Virtual classes with video and audio interactivity allowed instructors to establish a strong multicultural presence that aligned with their learners' needs, values, and communication styles providing a "high context" learning environment associated with Hispanic student success.

Online Cohort: Spring 2018

The first cohort of HEP online students began in the spring 2018 semester. The HEP Program was able to bridge the technology gap for HEP students by purchasing refurbished, in like-new condition laptops using the \$180 student travel stipend. Notebooks for Students, a non-profit organization, provided laptops that included a four-year warranty, a Windows 10 operating system, and a complete suite of Microsoft Office products.

Forty-one students attended a four-hour student orientation in Raleigh, NC during the first week of January. During the orientation, students received their laptop and instructions in using Adobe Connect web conferencing software.. The goal for this hands-on activity was to ensure that students knew how to operate their laptops and the software. Since the steps followed at orientation were the same as those required for each virtual class, this activity was crucial for the students' success. Students were grouped in five different classes according to where they lived, and assigned to one of five instructors. Throughout the semester, students attended mandatory virtual classes twice a week, during which they participated in traditional lectures and discussions, reviewed homework, and asked questions, just as if they were in a seated class. Students also had unlimited access to nine subject-specific virtual study sessions, also delivered through Adobe Connect.

With the support of web conferencing software, workflow remained largely the same even after transitioning to the online format. The use of Adobe Connect allowed instructors to incorporate most of the important elements of the seated classrooms into their teaching. Instructors in the math classes used the whiteboard function to work math problems in front of students, who could then ask questions using text or audio chat. Students used their microphones and the meeting's *audio-streaming* function to practice reading aloud in their English classes. Instructors were able to use the *polling* function to create multiple-choice questions to check student understanding during lectures on history and science. In all classes, instructors used the *sharing* function to share and annotate videos, PowerPoints, PDFs and images. The *chat* functions allowed students and instructors to engage in all types of collaborative activities. Figure 1 shows an instructor preparing to annotate a science quiz with the correct answers for students.

Figure 1: Screenshot of an Adobe Connect classroom with an instructor who has just completed annotating the correct answers on a science test for students.

Tabla 1		
Tipo de variable	Contenido de variables tipo (porcentaje de masa)	Peso molar (óbito para 1 molécula, g/mol)
América	72	32,338-34,989
Ammonium	22	23,304-24,999
Ácido fosfórico	72	16,007-16,006
Ligado	22	9,008-18,998

Tabla 2	
Muestra de variable	Contenido de variables tipo (porcentaje de masa)
1	72
2	22
3	72
4	22

[click to enlarge]

Impacts

Moving the HEP program instructional method from seated to online provided immediate benefits for the college, the instructors, and the students.

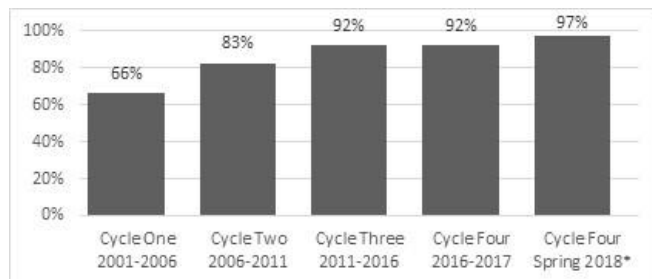
1. **Increased savings.** The switch represented a significant cost-saving measure for the college by eliminating approximately 85 percent of travel costs.
2. **Increased faculty efficiency.** Moving from a traveling model to an online model decreased the faculty's travel

time and workload, allowing them to use that time to focus more on student engagement.

3. **Missed classes: A thing of the past?** Weather-related cancellations, typical in January, were no longer a problem to the program. Although snow forced the college to close during the second week of classes, all HEP instructors held online classes as scheduled.

As mentioned at the beginning of the article, benefits such as these must be weighed against the negative impacts on student performance sometimes associated with the online model. Although a confounding change in the state exams prevented the longitudinal comparison of student performance before and after the transition, retention rates for the history of the program were available for analysis. Student retention rate for the first online cohort (Spring 2018) were compared with retention data compiled during the previous three cohorts (Fall 2016, Spring 2017, and Fall 2017) of the latest grant cycle. This very preliminary analysis suggested no drop in student perseverance for the first online cohort compared to the three previous cohorts, $\chi^2(1) = 2.23$, $p = .13$. Figure 2 shows student retention rates for the three previous grant-reporting cycles, as well as the comparison groups in the current cycle.

Figure 2: Retention rates for measured periods in the history of the HEP program (*online).



[click to enlarge]

Conclusion

The early results suggest that transitioning the HEP program to an online format supported with web conferencing did not negatively affect student retention. In this particular case, regular synchronous interaction allowed the instructors to provide the extra support necessary for student success in this *high-risk* online setting. This lack of negative impact, coupled with the obvious benefits associated with moving this unique population online, suggests that HEP online is a great idea.

The transition to the online model was not without its challenges. Two changes are planned for the future based on technical problems in the first cohort. The Spring 2018 orientation occurred on a weeknight and only lasted four hours. Unfortunately, many of the students required basic training, which did not leave enough time to properly discuss program requirements and train the students in the use of Adobe Connect. Beginning with the next cohort, students will complete an eight-hour orientation on the Saturday before the semester begins in order to include basic computer training along with the Adobe and course orientation. Students also provided their own headsets for the first cohort, and many did

not work well in the Adobe Connect environment. This created a troubleshooting headache during the orientation and took even more time from the orientation. In the future, USB headsets will be provided, and all the necessary software will be installed and tested prior to the student orientation to ensure compatibility with Adobe Connect.

As the HEP example shows, successful online models of education are possible with the proper support for students. It is now time to quit asking whether online instruction is comparable to face-to-face instruction, and instead focus on when, and with what supports, is it comparable to face-to-face instruction. As the emphasis on online education continues to grow, and programs expand into non-traditional areas of education, it will be important to develop within an evidence-based framework. Adherence to practices, benchmarking, and constant evaluation should become a part of the online developer's toolbox. Hopefully, the HEP transformation at Wake Technical Community College will inspire those who are interested in developing and assessing the quality of new online programs.

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Chri Roddenberry is an associate professor at Wake Technical Community college. He holds a Ph.D. in Social Psychology from UNC Chapel Hill and has been teaching online since 2003. Chris began using synchronous interaction in his online classes since 2009 and is currently a CO-PI on a FIPSE grant assessing the impacting of synchronous teaching models on minority student outcomes. In his spare time, Chris loves playing and watching baseball.

Maria Fister is the Director of the High School Equivalency Program (HEP) at Wake Technical Community College. Her work focuses on researching, developing, and implementing innovative eLearning strategies to address programming challenges, which include effective instruction, reliable assessment, consistent recruitment, and successful student retention. Currently, she concentrates her efforts on exploring technologies and resources that help bridge the teacher-student connection gap that takes place between face-to-face instruction and online learning environments.

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