Background

The school experiences of adolescents, particularly minority and low-income students, play a significant role in determining the trajectory of their education expectations and career knowledge in STEM and other fields which are critical for achieving postsecondary success (Roderick, Coca, & Nagaoka, 2011; Schneider, 2015). The College Ambition Program works to provide both college access services and STEM-specific learning opportunities to students from underprivileged schools.

Researchers and policymakers must work to leverage technology to make college-access possible, plausible, and accessible to more than the few. The coming generation of students will be the most technologically inclined; therefore, we must work to incorporate technology into processes that once relied exclusively on human capital, especially within already under-resourced environments. Our platform provides a self-guided program that provides college access information, workplace readiness, and ultimately connects students to tangible workplace experiences. These workplace experiences will allow students not only to visualize themselves in spaces that require college success, but to physically experience them as well.

Objective

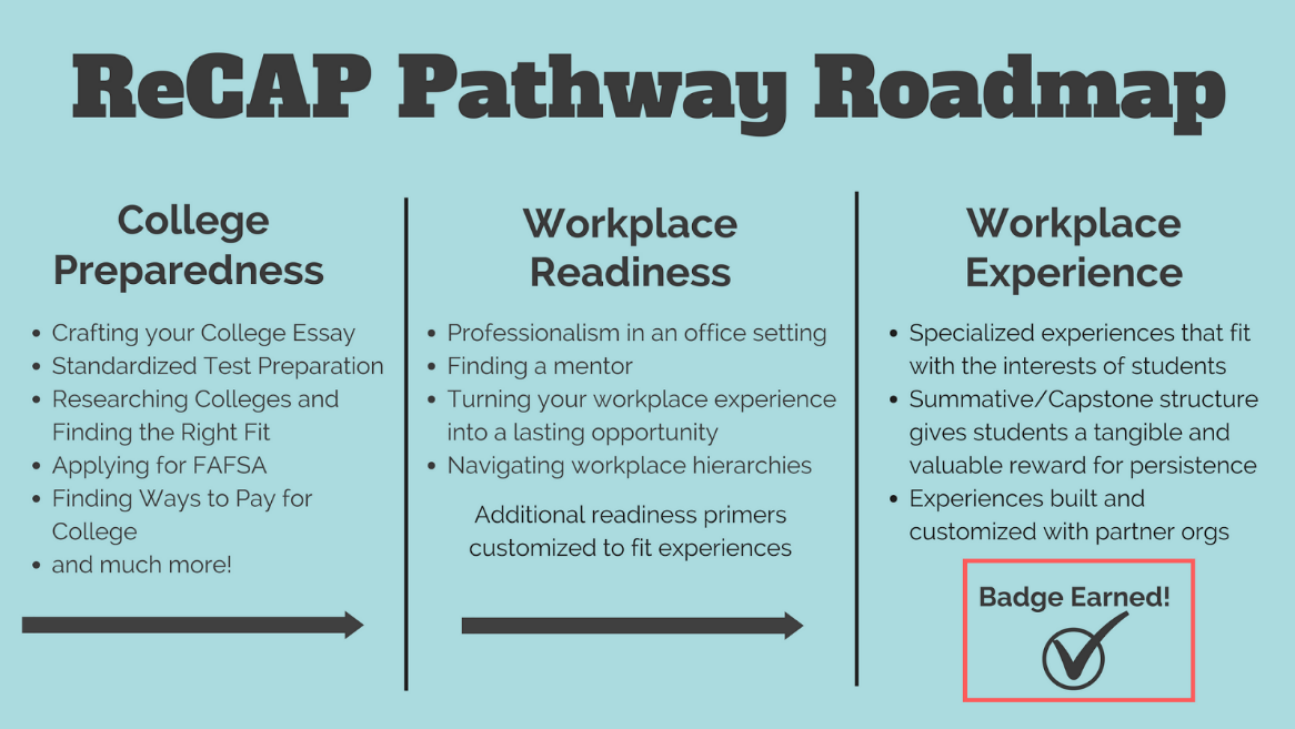
The underlying concept of the technological platform stems from decades of research in cognitive flexibility theory (Spiro & Jehng, 1990; Spiro, Collins, Thota, & Feltovich, 2003) and connected learning (Fanfarelli, Vie, & McDaniel, 2015; Gonzalez, 2015; Janzow, 2014; Kehoe & Goudzwaard, 2015) that prioritizes real world experiences over traditional methods of learning. Learning is more likely to occur when knowledge is personalized and culminates in the creation of an artifact that can be monitored and disseminated through digital technology. Learners take personal ownership by cultivating and experiencing out-of-school opportunities that are markers of perseverance and achievement. Our research question is simple: Does augmenting an existing, moderately successful college access intervention with an innovative technological component increase student engagement and program effectiveness?

Setting

CAP serves juniors and seniors in 11 high-need urban and rural Midwestern high schools. The population of students in CAP schools who will participate in this project are 46.9% African American, 12% Hispanic/Latino, 6.4% Asian, 3.2% two or more races, and slightly less than 1% Native American or Hawaiian, with the remainder of students identifying as white. Though demographically different, the challenges that urban and rural schools face are similar. Many students would be first in their family to attend college, have lower average household income than the national and state average (Keaton, 2014), and have parents reluctant to send their students to four-year residential colleges (Burkander, 2014). Additionally, many underfunded urban and rural schools do not have a college-going culture. Across contexts, students require a dynamic program that addresses their unique needs.

Intervention

CAP centers are staffed by a half-time site coordinator deliver a wide-range of context-specific college preparation, tutoring and STEM mentoring services. The technological platform was created with their input, evolving out of existing college preparation services. This technological platform is comprised of primers, playlists, and pathways. Within each playlists is a set of 5-10 minute primers that are organized and grouped into pathways containing related content. Pathways widen the reach of site coordinators, as they can be completed wherever students are. The figure below details the pathway.



Research Design

(1) Randomization. Each student who comes to a CAP center will be randomly assigned to either the control condition, with traditional CAP services, or the treatment condition, with the digitized playlist experiences. The probability of being assigned to the treatment condition will be .5 for all students. This randomization procedure will ensure initial comparability of the intervention and control groups.

(2) Attrition. Overall attrition is expected to be minor. The target population have demonstrated a commitment to staying enrolled in high school by making it past the typical dropout year of 10th grade (Neild & Balfanz, 2006), and show an engagement with school by seeking CAP services; the 11th and 12th graders who are enrolled in the CAP schools look different than their peers who have dropped out of school (Rumberger, 2011). The primary outcome measure of interest, college enrollment, will be verified via follow-ups by phone, and triangulated using administrative data from the Michigan DoE and the National Student Clearinghouse. Differential attrition is not a major issue as the intervention should not cause students to leave the study at a different rate than students who are randomized into the control condition.

(3) Baseline Equivalence. Because students are randomized into treatment and control conditions and attrition will be minimized, there is little concern that baseline equivalence will not be

established. However, detailed demographic information will be collected through CAP surveys and can be obtained from administrative data. This information will allow for any necessary individual-level statistical adjustments, pursuant to What Works Clearinghouse Evidence Standards (U.S. Department of Education, 2013).

(4) Outcome Eligibility. The outcome of interest to answer our research question is college enrollment in the fall, immediately after high school graduation. There are two cohorts of students, seniors in 2017-2018, and juniors in 2017-2018. Results from the senior class will be available in Fall 2019. Fall 2020 will yield two analyses, one for juniors in 17-18 (two years of treatment), and an additional exploratory analysis that combines the two cohorts to test the difference between one and two years of treatment.

Data Collection and Analysis

Data collection procedures will remain consistent with previous years, augmented by the technological platform's ability to gather data dynamically. We will continue to run a year-end, school-wide survey to compare new CAP data with previous baseline years.

Previous CAP analyses have yielded realistic estimates of parameters for calculating the necessary power to answer the research question. The mean college enrollment rate in schools with traditional CAP services is .66 (Schneider, 2015). The sample size of this multisite randomized trial is 1100, with an average of 100 students per school and a total of 11 schools. This number takes into account students who may be lost due to attrition.

Previous results from CAP showed roughly an eight-percentage point increase in post-secondary enrollment in treatment schools sustained over several years (Schneider, 2015), with our latest analyses bringing that number up to almost 10%.

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