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THE IMPACT OF PRE/POSTENROLLMENT INTERVENTIONS ON COLLEGE SUCCESS FOR FIRST-GENERATION BLACK STUDENTS

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Student retention continues to be a significant issue for colleges and universities during the first and second years of a student's academic career (Seidman, 2012). This problem is especially prevalent for first-generation Black students during their first-to-second and second-to-third semesters and through college graduation (Freeman, 2008; Kaba, 2005; Peart-Forbes, 2004). As the population of first-generation Black college students continues to increase, the issue of retention and graduation for these students has become an even more important issue (Harper, 2013; Strayhorn, 2011; Kaba, 2005; Pike & Kuh, 2005; Terenzini, Springer, Yaeger, Pascarella, & Nora, 1996).

The purpose of this study was to examine the impact of the Aspiring Eagles Academy (AEA) pre/postenrollment intervention program on the retention rates and GPAs for first-generation Black college students at a public Historically Black Institution (HBI) in the south. The AEA summer program includes but is not limited to helping incoming freshman with understanding college expectations, time management, connecting to campus resources, developing a social support system, and managing the transition from high school to college. Unfortunately, despite widespread intervention efforts like the AEA program, national data continue to reveal greater attrition rates and lower graduation rates for first-generation minority college students in both North Carolina and throughout the nation (Phinney & Chuateco, 2005). Conversely, first-generation and Black students continue to attend college at increasing rates nationwide (Strayhorn, 2011; Hussar & Bailey, 2007; Williams, 2009). The 2008 Scholastic Aptitude Test (SAT) reported 38% of students who took the test identified as first-generation, which represented a 10% increase compared to the 2001 data (College

Board, 2001). The nationwide distribution of conferred college degrees for Black students increased 55% from 98,251 to 152,457 overall from 1998-2008. As the population of first-generation students continues to increase, data from longitudinal studies performed by the National Center for Education Statistics (NCES) revealed that these students were twice as likely to depart from an institution prior to their second year (Choy, 2001; NCES, 2010). Choy (2001) also analyzed variables affecting college student departure including employment, gender, and financial aid. Choy (2001) controlled for these factors, and first-generation status was still a significant predictor of first-year student departure prior to the second year. In a study at four-year universities, Berkner and Choy (2008) found that 23% of students reported that their parents did not have education beyond high school. Gibbons and Schoffner (2004) found similar results in a national longitudinal study as 27% of high school graduates identified as being first-generation. Ishitani (2003) noted in a study of college freshmen that those who identified as first-generation were significantly more likely to depart, especially during the first year, compared to their continuing-generation counterparts.

Self-identification as Black has also shown to be a significantly related factor to first-year college departure. The Consortium for Student Retention Data Exchange (CSDRE, 2003) reported that for the college class entering in 1999, Black student retention after the first year was 74.7% compared to an 80.3% overall rate. On the state level, after the first year, Black students entering the University of North Carolina system in 2004 were retained at a 77.9% rate (UNC, 2010) compared to the national average in 2004 of 74.3% after the first year (American College Testing Program, 2009). Seidman (2005) noted that a lower first-year retention rate for Black students combined with issues posed by their graduation rates presented a significant issue in higher education. Even though the number of Black college graduates has increased, and the enrollment of first-generation students has increased, the overall graduation rates for both populations continue to be low (Harper, 2013). Nationally, NCES (2009) reported a 48.4% four-year graduation rate for Black students nationally compared to 58.2% of all Americans and 64.2% for White students. Further, NCES reported the national four-year graduation rate for Black males was 44.6% compared to 65.4% overall and 65.4% for White students.

Freeman (2008) noted that Black students enrolled in less rigorous high school courses, which were significantly related to college enrollment and persistence. Further, the College Entrance Examination Board (College Board, 2001) data revealed a 185-point gap in Black student performance on the SAT when compared to White students. SAT performance continues to be the most valid predictor of collegiate academic performance (Shivpuri, Schmitt, Oswald, & Kim, 2006).

The National Center for Education Statistics (2005) reported that first-generation students earned a 2.5 GPA during the first year of college compared to a 2.8 GPA for continuing-generation students.

To address the gap in Black student performance, early intervention programs are tailored provide academic and individualized support and development that can have a positive impact on college student retention (Benmayor, 2002; Committee on Science & Technology, 2007; Dappen & Isernhagen, 2005; Koenig,2009; Toutkoushian & Smart, 2001; Villarejo, Barlow, Veazey, & Sweeney, 2008; Yarbrough, 2002). Intervention programs such as summer bridge programs provide academic support prior to students' enrollment (Gutierrez, 2007). Postenrollment programs such as living-learning communities (LLCs) can also provide needed academic and social support for students especially during the first year (Inkelas et al., 2007). Intervention programs that can identify students' needs early and then provide continuous and intense support can positively impact college success (Seidman, 2005). While there is extensive research on intervention programs and their impact on college student success, there is also a lack of attention given to the impact of intervention programs, which employ Seidman's (2005) college retention formula for student success model. In this model, pre/postenrollment intervention programs begin with early contact with a group of students prior to enrollment and then provide continuous and intensive support to the same group of students postenrollment. Therefore, little is known about the impact of pre/postenrollment programs on student populations such as first-generation Black college students. Further, there have been no studies conducted to evaluate the impact of this type of programming specifically on first-generation Black college students at Historically Black Institutions (HBI). To address this gap in previous literature, this study explores the impact of a pre/postenrollment intervention program at an HBI.

At North Carolina Central University (NCCU), an HBI in the University of North Carolina (UNC) system, the Aspiring Eagles Academy (AEA) provided students with a pre/postenrollment intervention experience focused on college transition. The purpose of this study was to examine whether participation in a summer pre/postenrollment intervention program (i.e. AEA) had a significant impact on the college success of first-generation Black students at NCCU. Specifically, we asked two primary research questions:

1. What is the effect of participation in AEA on the first-to-second semester retention rates, and first semester cumulative grade point averages (GPA)?
2. What is the effect of participation in AEA on the second-to-third semester retention rates of these students?

Conceptual Framework

The impact of participation in pre/postenrollment intervention programs was framed within the retention theories of Tinto (1993) and Seidman (2005) and focused on first-generation Black student participants. Tinto (1993) noted that students enter their first year of college with varied sets of characteristics, attributes, skill sets, and academic levels. These attributes help mold students' expectations of college affecting their views of academic and social experiences. In turn, college students' experiences, such intervention program participation, can affect their commitment to remaining enrolled at their respective institutions. Tinto (1993) further stressed the importance for creating supportive student communities on college campuses. Based on the framework of Tinto, Seidman's (2005) success model can provide guidance for colleges to positively impact their academic communities by increasing student retention and college success. The model encompasses Seidman's retention formula, which centers on the implementation of early, continuous, and intense intervention programs designed around the needs of the respective student population. Seidman's formula is designed to serve as a guide for colleges and universities when new programs and services are designed and implemented to support the academic success of their student populations.

Summer bridge programs are typically implemented as early interventions designed to assist with the academic and social integration for prospective or admitted in postsecondary education institutions (Gutierrez, 2007). Gutierrez recognized hybrid versions of bridge programs that may focus on the needs for transitioning into a collegiate environment combined with improving academic skills. Vargas (2005) noted bridge programs work with students who fall below the academic standards of an institution or those who enter with characteristics such as first-generation status or labeled as at-risk. Participation in a summer bridge program that continues into the academic year as a living-learning community (LLC) can increase participation in developmental courses, lead to more interactions with academic advisors, yield higher levels of course completion for participants, thus leading to greater academic success (Inkelas, et. al, 2007).

Methodology

Study Setting

This study was conducted at North Carolina Central University (NCCU), a public HBI located in Durham, North Carolina, with an annual enrollment of approximately 8,800 students enrolled in baccalaureate and master's degree programs. The university offers over 100 fields of study for

undergraduates and over 40 graduate degree programs. NCCU has a strong tradition of teaching, research, and service and dedicates itself to prepare students as global leaders and community practitioners. NCCU has a nationally-recognized law school, modern visual and performing arts programs, as well as strong academics in sciences, business, humanities, and education. NCCU is located near North Carolina's acclaimed Research Triangle with a strong focus on research in the biotechnological, biomedical, informational, computational, behavioral, social, and health sciences fields. NCCU was also the first institution in the UNC system to make service learning a graduation requirement.

In 2008, NCCU began a University College with the central focus of student success within the first two years of enrollment. The mission of the University College is to assure a successful transition of first and second year students to the point that they accomplish educational goals during their college matriculation. The population for this study was all full-time, first-generation Black students at NCCU.

Sample

To gather our sample we used a definition by Ishitani (2006), which describes first-generation status as college students whose parents' or guardians' highest level of educational attainment was high school. This population of students was of particular interest as first-generation undergraduate students have a 21% lower graduation rate than continuing-generation students (Rooney, 2006). Further, first-generation minority students graduate from college at a rate 17% lower than continuing-generation students (Rooney, 2006). As Harvey and Anderson (2005) noted, for all ethnic minorities, Black students graduate with baccalaureate degrees at the lowest rate of 36.4% compared to the highest, Asians at 62%, followed by Hispanic students at 42%.

The study included a treatment group of first-generation AEA fall 2008 participants along with two control groups. First-generation status was identified using data from student submissions to the Free Application for Federal Student Aid (FAFSA). Control Group 1 (CG1) included non-AEA fall 2008 first-generation students. Control Group 2 (CG2) included continuing-generation fall 2008 AEA participants. The total fall 2008 AEA cohort included 100 participants. Unidentifiable student records were retrieved from NCCU and sorted by participation or non-participation in the AEA. To be chosen for the treatment group, students must have participated in the AEA program and must have been classified as first-generation and Black.

Figure 1. AEA & Non-AEA Participants

Group	Participants
Treatment	46
CG1	180
CG2	46
Total	272

A sample size generator was used to estimate the sample needed for CG1. Using systematic random sampling, CG1 was created from all first-generation students who began enrollment in fall 2008, attempted 12 or more credit hours during the time of the study (full-time status), and did not participate in the AEA program. All continuing-generation students from the fall 2008 AEA cohort were included in CG2, which was to be 54 students. CG2 was then created by identifying all of the continuing-generation who participated in the AEA program in fall 2008.

Intervention

A cross-sectional approach was used in this study comparing one treatment group to two control groups. First-generation Black freshmen who participated in the fall 2008 cohort of the AEA program served as the treatment group. The participants in the AEA program lived in a residence hall for five weeks the summer before their freshman year and throughout their freshman year. They attended summer school in common course sections, attended on-campus activities together, and were intentionally exposed to academic resources earlier than other freshmen. This intervention program was specifically designed to ease participants' academic and social transition into the college environment targeting admitted incoming freshmen who had low SAT scores, low high-school GPA, or who were classified as first-generation. Intervention with the students continued into and throughout the freshman year as students lived in the same residence hall, attended similar freshman year seminar courses, and participated in academic and social activities in groups.

Analysis

Using systematic random sampling, one control group (CG1) of similar size to the treatment group was selected. CG1 consisted of first-generation freshmen that began in fall 2008 but did not participate in the AEA intervention program. A second control group (CG2) consisted of the continuing-generation freshmen from the fall 2008 cohort who also participated in the AEA

program. The approach for this study was to examine the impact of the intervention program on first-generation students' first-to-second and second-to-third year retention rates and GPA.

A spreadsheet was requested from the NCCU enrollment researcher including the first-to second and second-to-third semester retention rates, credit hours attempted, and cumulative GPAs for the fall 2008 AEA participants. Retention rates and GPAs from the treatment group were compared to the control groups to determine if there were significant differences according to the research questions. The dependent variables were first-to-second semester and second-to-third semester retention rates and GPA. Semester to semester enrollment was considered in defining retention of participants. Retention rates for both groups were measured on a nominal dichotomous scale noting progression or non-progression based enrollment during the second and third semesters. Based on the research questions, the first-to-second and second-to-third semester retention rates and GPAs were compared for the experimental and control groups.

The means and standard deviations were calculated for the retention rates and GPA for both the treatment and control groups. Next, a binary logistic regression was used to test the significance of Siedman's model for statistically significant relationships ($p < .05$) among the variables. The two-way MANCOVA test helped compare the retention rates and GPAs for the experimental and control groups. The research questions were analyzed and statistical significance was measured using a multivariate analysis of variance (MANOVA), and the differences for the three groups were evaluated based on the research questions using ($p < .05$). Significant differences in the first-to-second semester retention rates and/or GPAs among the experimental group, CG1, and CG2, present Wilks lambda values below the .05 level.

Results

Beginning in summer 2008, one hundred students enrolled in the five-week AEA summer pre/post-enrollment intervention program at NCCU prior to beginning their freshman year in a living-learning community (LLC) environment. During the summer, students attended common general education courses and were exposed to campus activities and academic resources. Beginning with the fall term, students lived in the same residence hall during their freshman year, attended similar courses and campus activities together. The total sample size of 272 was calculated using a sample size generator based off a .05 significance level and the population of 930 full-time Black freshmen who began at NCCU in fall 2008. The treatment group comprised 46 of the 100 AEA students who met the criteria: first-generation Black students. CG1 was comprised 180 non-AEA

students who met the criteria: first-generation Black students. CG2 comprised 46 out of 100 AEA students who met the following criteria: continuing-generation Black students. The sample included approximately 35% males and 65% females. The descriptive statistics indicated that 16.9% of the sample was in the treatment group, 66.2% in CG1, and 16.9% in CG2.

Research Question 1 sought to examine if there were significant differences regarding first-to-second semester retention rates among the three groups. Research Question 2 sought to examine if there were significant differences regarding second to third semester retention rates among the three groups. The descriptive statistics for retention are presented in Table 1 for the experimental group, CG1, and CG2. The treatment group had a first-to-second semester retention rate of 88.89% and 71.11% for second-to-third semester. CG1 had a retention rate of 81.67% for first-to-second semester and 67.22% for second-to-third semester. CG2 had a first-to-second semester retention rate of 97.78% and 82.98% for second-to-third semester.

Table 1. Semester Retention by Groups

Group	First-to-Second Retention		Second-to-Third Retention	
	Frequency	Mean	Frequency	Mean
Treatment Group	40	88.89	32	71.11
CG1	147	81.67	121	67.22
CG2	46	97.78	29	82.98
Total	232	85.29	182	70.50

To examine Research Question 1, a binary logistics-regression model was used to determine if there was a significant relationship between the treatment group and control groups regarding first-to-second semester retention rates. Using first-to-second semester retention rates and group comparison, these data helped to identify whether students were retained from first-to-second semester or not retained within their groups. There were 272 students in the sample, and 232 students returned for their second semester, while 39 did not return for the second semester. One record was eliminated by SPSS as a missing case. Hence, if SPSS predicted that all students would return for the second semester, it would be correct 232 out of 271 times. Therefore, this model classified first-to-second semester retention rates correctly for approximately 86% of students.

Research Question 2 was examined using a binary logistics-regression model to determine if there was a significant relationship between the experimental and control groups regarding AEA participation and second-to-third semester retention rates. Using second-to-third semester retention rates and group comparison, SPSS is able to help predict whether students were retained from second-to-third semester or not retained within their groups. There were 272 students in the sample with a total of 191 students that returned for their third semester, and 81 students did not return. One record was eliminated by SPSS as a missing case for first-to second semester. Hence, if SPSS predicted that all students would return for the second semester, it would be correct 191 out of 271 times. Therefore, as displayed in Table 2, this model classified second-to-third semester retention rates correctly for approximately 70.2% of students.

Table 2. GPA by Groups

Group	First-to-Second Retention		Second-to-Third Retention	
	Frequency	Mean	Frequency	Mean
Treatment Group	40	2.09	32	1.99
CG1	147	2.42	121	2.37
CG2	46	2.23	29	2.18
Total	232	2.33	182	2.27

The logistics regression further displayed that the residual chi-square statistic is 5.131 which was not significant at $p < .05$ with a p value of .162. The interpretation of this value is when one or more of the variables were added to the model, its overall ability to predict second-to-third semester retention was not significant. The score statistic for group membership ($p = .092$) was also not significant. But the simple standard contrast for the treatment group and CG2 ($p = .035$) was statistically significant as $p < .05$. According to Field (2009), the next phase for a logistics regression was the stepwise calculation using the variable with "the highest value for the score statistic that has significance below .05" (p. 284). Therefore, the contrast of the treatment group and CG2 was used which had the highest score statistic (4.423) with a p value of .035. The log-likelihood statistic with the constant was 331.425.

When the contrast added, the log-likelihood statistic dropped to 326.33. This value indicated that even though the model does was not overall significant, the addition of the contrast between the experimental group and CG2 added value to the model's ability to predict second-to-third semester retention. Using the model chi-square statistic, the difference between the model with the contrast of the experimental group and CG2 and without the contrast was 5.527 which was not significant (p = .137) at the p < .05 level. This value indicated the overall model was better at finding significant relationship between the treatment group and CG2. Also, the effect size of the model was represented by the Negelkerke R2 measure at .029. Since the model itself did not reveal overall significance, the 2.03 odds ratio did not indicate that the model was a good representation of the significant effects of the intervention on the college success of the population.

Discussion

There is a lack of research on pre/postenrollment intervention programs especially for first-generation Black students at historically Black institutions (HBIs). There is also a lack of research based in Seidman's (2005) model for college student success to examine if early, intense, and continuous intervention can have a positive impact on college success for first-generation Black students in pre/postenrollment intervention programs. Numerous studies have revealed positive impact of first-year intervention programs on college success including factors involving the social transition and academic success for first-generation college students (Gutierrez, 2007; Inkelas et al., 2007; Kelly & Cho, 2009; Suzuki, 2009; Williams, 2009; Yelmarthi & Mawasha, 2008).

This study was conducted to determine if a unique pre/postenrollment intervention program had potential for duplication at HBIs to positively impact the college success of first-generation Black students. Results of the study found that neither first-to-second nor second-to-third semester retention rates for first-generation AEA participants were significantly different compared to first-generation AEA nonparticipants. First-to-second semester and second-to-third semester retention rates were significantly higher for continuing-generation AEA participants compared to first generation AEA participants, but there were no significant differences in GPA. Lastly, there were no significant differences for gender regarding AEA participation and retention or GPA.

Research Question 1 examined the impact of the AEA on first-to-second semester retention rates for the treatment group, CG1, and CG2. The overall logistics model was found to have significance ($p < .05$) mainly due to the added effect of the comparison between first-generation AEA participants and continuing-generation AEA participants regarding first-to-second semester

retention. First-to-second semester retention for continuing-generation students was 97.78% and added significance (p = .008) to the model with its comparison to first-generation AEA students at 88.89%. It should be noted that retention for first-generation AEA participants was higher than first-generation AEA nonparticipants at 81.67%; however, the added effect of the difference to the model was not significant (p = .492) at the p < .05 level.

Descriptive statistics and data analysis indicated that AEA program participation resulted in a significant difference in the first-to-second semester retention rates for first-generation students compared to continuing-generation students. The significant difference (p = .008) between first-generation AEA participants and continuing-generation participants showed that continuing-generation students performed well in the AEA model at NCCU. Therefore, Null Hypothesis 1 was partially rejected based on the negative difference in first-to-second semester retention for first-generation AEA students compared to continuing-generation AEA students. As a result, examination of Research Question 1 and 2 did not result in positive impact of the AEA program on college success for first-generation Black students regarding first-to-second semester retention.

Based in Seidman's (2005) model of college success, the findings of this study revealed several key implications regarding the examination of the impact of pre/postenrollment intervention programs. First, Seidman (2005) stated that, "For intervention programs and services to be effective, they must be powerful enough to affect change" (p. 295). At NCCU, the AEA program model may not have provided the early, intense, and continuous intervention necessary to positively impact college success. Retention was not positively impacted by the AEA for first-generation Black students. GPA was also not positively impacted by the AEA for first-generation Black students. Dennis et al. (2005) and Raley (2007) agreed that pre-enrollment characteristics, such as first-generation status or academic performance in high school, could be powerful influences on a college student's experiences with the academic and social factors at the institution. Therefore, these findings indicate that the AEA intervention may not have provided adequate academic and social support for first-generation students during the first-to-second semester as there were no significant differences in retention for first-generation AEA participants compared to first-generation non-AEA participants. Based on findings regarding GPA, the AEA model also needed to provide more intentional and intense methods of academic support for first-generation students.

The findings indicated that retention rates overall were significantly higher for AEA continuing-generation students compared to AEA first-generation students. As noted by Suzuki (2007), effective intervention programs help provide supportive atmospheres and can increase the likelihood for

student commitment to the institution ultimately leading to college graduation. This study revealed that the AEA program did not positively impact college success overall for first-generation students, but it may have provided a supportive atmosphere to positively impact college success for continuing-generation students who were identified as needing early intervention. Therefore, the AEA model in this study may be more adequate to support college success for continuing-generation students.

Limitations

This study presented a number of limitations involving the research site chosen, the research design, and the included variables. First, this study was limited to one university and participants were not randomly assigned to groups, meaning the generalizability to other institutions is limited. Future research of intervention programs may choose to devise experimental designs that would include pre-and post-tests of the impact of the intervention program. The same limitation with generalizability is true for the design of the intervention program because it was specific to the campus under investigation, and program designs vary across campuses.

Conclusion

The findings of this study indicated that the pre/post-enrollment AEA intervention program at NCCU did not positively impact college success for first-generation Black participants. However, based in Seidman's (2005) retention formula, the significant findings present unique opportunities for future action. The AEA yielded significantly higher retention rates for continuing-generation AEA students in this study compared to first-generation AEA students. Seidman's (2005) college success formula states that early, continuous, and intense intervention programs have a positive impact when designed around students' needs. Practitioners implementing intervention programs, especially for first-generation Black college students should be intentional and deliberate during the planning process. Therefore, an enhanced intervention program may indeed positively impact first-generation Black college students' retention, GPA, and satisfaction given proper assessment and early identification of students' needs.

The findings of this research study are congruent with the assertion by Davidson et al. (2009) that "it is becoming increasingly apparent that variables that prominently influence the persistence decision of one student or group of students may be weakly related or unrelated to the persistence of other undergraduates" (p. 373). The solution to college success is situational based on the

characteristics of respective institutions and respective student populations. Although Seidman's (2005) formula was not corroborated in this study with the examination of the impact of the AEA on first-generation students, it did reveal positive results for continuing-generation AEA students. First-generation and Black students enter into college with numerous academic and social barriers that can impact their college success (Freeman, 2008; Ishitani, 2006; Ishiyama, 2007; Nebolisa, 2007), and numerous programs have been successful in impacting college success (Chen, 2005; Naumann et al., 2003; Rooney, 2008; Williams, 2009). The results of this study showed a clear need in the AEA for a stronger focus on academic support for first-generation students in the AEA which could have been realized prior to implementation using an intentional pre-enrollment survey or assessment tool. Therefore, it is suggested that future implementation of pre/postenrollment intervention programs guided by Seidman's formula, especially for first-generation Black students at HBIs, focuses heavily on the early identification of students' needs. This focus should especially be on academic performance indicators, measurements of student expectations, and measurements of students' perceptions.

Administrators at HBIs should continue to utilize Seidman's (2005) retention formula for college student success to plan and assess intervention programs for their respective student populations. During the implementation process, a special emphasis should be placed on intentional support efforts based on strong early identification methods of students' needs. As Harper and Quaye (2009) stated, "college students at colleges and universities are different; the ways they experience and respond to our campuses are varied. Thus, educators and administrators must be strategic and intentional about fostering conditions that compel students," (p. 1).

Seidman (2005) stated that early identification of students' academic and social needs followed by consistent intervention can lead to greater college retention rates. Based on the results of this study, combined with the assertion by Davidson, Beck, and Milligan (2009) that cohorts of college students from different institutions react differently in their respective environments, it is recommended that future pre/postenrollment intervention programs consider using an expanded version of the Seidman formula: Retention = Early Identification + Early, Intense, Continuous, and *Intentional* Intervention.

This expanded formula could guide scholar practitioners to provide more intentional methods of academic and support based on early identification of needs that could positively impact college success. As an example of utilization of the expanded formula, as Seidman (2005) recommended, an institution would engage in methods of early identification of first-year students' needs preferably

beginning at the time of application and acceptance to the institution. The institution would then provide early, intense and continuous intervention to those students with interventions guided by the early identification of students' needs. The addition of Intentional to the Seidman formula would guide institutions to implement intervention programs not based on a one-size-fits-all model. Instead, it would help institutions to recognize the differences in academic and social needs among cohorts of college students. Unlike the implementation of the AEA, in order for the intervention to be intense enough, it may be advantageous for students to sign a contract at the beginning of the program stating that they agree to the mandatory set of activities. It should be presented to the students that the set of activities have been intentionally designed to positively impact their college success.

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