



Blugold Beginnings Summer Camp: An Evaluation of Outcomes for STEM, Transition, and Academic Pre-college Summer Camps

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Background

Access to summer camp programming has routinely been a challenge for traditionally underrepresented students due to the high costs of registration fees (Orfield, Losen, Wald, & Swanson, 2004). Research has suggested that some differences in student achievement may be directly related to summer learning differences (Alexander, Entwisle, & Olson, 2007). Summer is an important time to maintain academic skills, and many universities utilize the summer months to engage and recruit underrepresented students (Foster & Savala, 2012).

The Blugold Beginnings College and Career Readiness Program works with local schools to provide summer programming options for students in the Greater Eau Claire Area. Local students have the option of attending one of three summer camps at no cost to them. These camps include a transition summer camp for students moving from elementary to middle school, a summer camp focusing on promoting STEM interest and understanding in 6th-12th grade students, and a pre-college summer camp that focuses on teaching students what a college education entails and how to academically prepare.

Some of the research used to develop the Blugold Beginnings Transition Summer Camp includes:

- The promotion of mutual respect among middle school students can promote students' sense of belonging (Anderson, 2003).
- Group support among peers and the incorporation of problem-solving training may positively impact a students' capacity to deal with the stress of transitioning into middle school (Greene & Ollendick, 1993).

Some of the research used to develop the Blugold Beginnings Pre-college Summer Camp includes:

- Working with traditionally underrepresented students solely throughout the academic year may not be enough to ameliorate differences in student achievement for minority students (Cates & Schaeffe, 2011).

Some of the research used to develop the Blugold Beginnings STEM Summer Camp includes:

- Summer programs centered on science, technology, engineering, and math held on college campuses offer an ideal environment for students to learn about possible career opportunities in STEM fields and to encourage a deeper understanding of STEM concepts (Knox, Moynihan, & Markowitz, 2003).

The purpose of the current research is to investigate whether students who attended the Blugold Beginnings Summer Programming sessions tend to show significant changes on measures associated with each of the three summer camps, including their self-reported level of interest in STEM fields, aspirations for post-secondary education, and decrease in their levels of anxiety and stress when transitioning into their new middle school.

Method

Summer Camp Sessions

Three different summer camp sessions are held by the University of Wisconsin-Eau Claire Blugold Beginnings program for Eau Claire Area students over the summer. Each of these camps has a different theme including one centered on science, technology, engineering, and math (STEM) education, another developed to facilitate students' transition into middle school, and finally a pre-college summer camp that concentrates on informing students about post-secondary education options. The STEM camp is open to students entering 6th-12th grade, and during the camp students receive academic instruction in STEM related areas, team building activities, take field trips, and participate in other fun activities around campus. The transition camp was developed to decrease anxiety for students entering the 6th grade and transitioning to a new middle school. The pre-academic camp was developed for middle and high school students who attend a week-long overnight camp that helps inform students on the steps they need to take to prepare for higher education.

Instruments

Each of the surveys given to students who attended the three summer camps consisted of 11 questions that varied in format. These questions centered around intended programming outcomes specific to each of the camps.

An example item on the transition camp survey includes: "Which of these things are you worried about for next year in middle school?"

One item on the STEM camp survey includes: "I am interested in learning more about science, technology, engineering, and math."

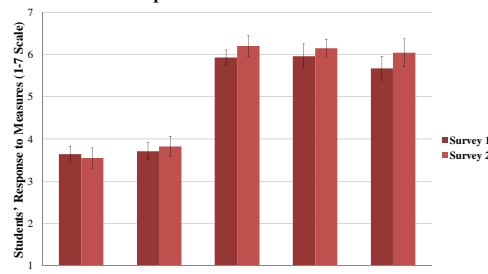
On the pre-college summer camp, an example of the one survey item includes: "My education is important to me."

Summer Camp Participants

Students from the Greater Eau Claire Area along with several outreach districts attended the summer camp sessions. A total of 36 students attended the STEM summer camp, 20 students attended the transition camp, and 29 students participated in the pre-college camp. Many of these students identify as low-income, first-generation, or minority with students who identified as meeting these criteria highly encouraged to participate. Students within the Eau Claire School District were able to attend at no cost upon the return of a consent form.

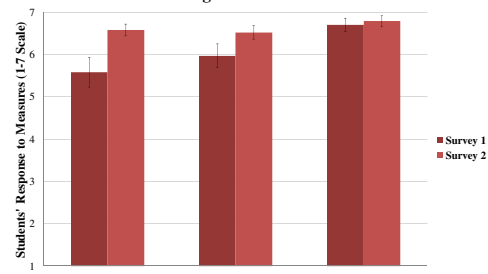
Results

Responses to Academic Measures



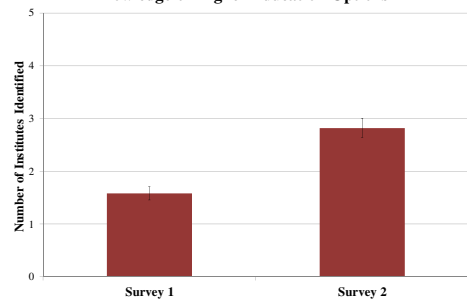
Among students who participated in the Academic summer camp (N=27), students reported significantly higher levels of 5 Having set goals they want to reach for the next school year from the pre-survey (M=5.67, SD=1.59) to the post-survey (M=6.04, SD=1.29), $t(26) = -2.18, p=.039$. However, students participating in the Academic summer camps did not report significantly higher levels of 1 That they are a good student; 2 That they are able to get good grades in their classes; 3 That their education is important to them; and 4 That they plan on taking challenging classes (all $p>.05$).

Feelings Towards STEM



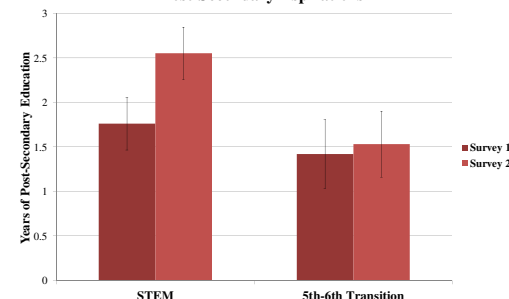
Among students who participated in the STEM summer camps (N=33), students reported significantly higher levels of 1 Their interest in a science, technology, engineering, or math degree from the pre-survey (M=5.58, SD=2.03) to the post-survey (M=6.58, SD=0.79), $t(32) = -3.25, p=.003$ and 2 Their reported certainty of being successful in a science, technology, engineering, or math program from the pre-survey (M=5.97, SD=1.59) to the post-survey (M=6.52, SD=0.91), $t(32) = -2.55, p=.016$. However, students participating in the STEM summer camps did not report significantly higher levels of 3 Their understanding of why science, technology, engineering, and mathematics are important ($p>.05$).

Knowledge of Higher Education Options



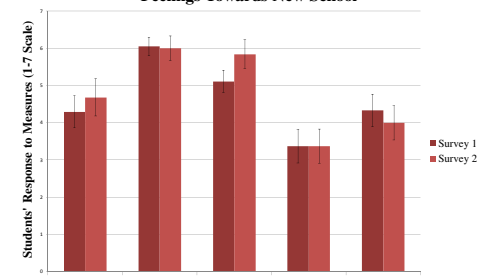
Among students who participated in the STEM summer camps (N=33), students reported a significant increase in the number of institutes they correctly identified as places where someone can earn a science, technology, engineering, or mathematics degree from the first pre-survey (M=1.58, SD=0.71) to the post-survey (M=2.82, SD=1.04), $t(32) = -7.36, p<.001$.

Post-Secondary Aspirations



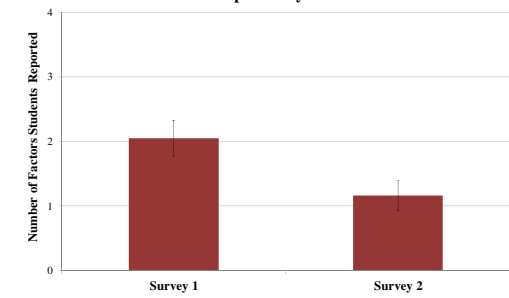
Among students who participated in the STEM summer camps (N=33), students' post-secondary aspirations increased significantly from the pre-survey (M=1.76, SD=1.70) to the post-survey (M=2.55, SD=1.70), $t(32) = -3.07, p=.004$. However, among students who participated in the 5th to 6th grade transition camp (N=19), students' post-secondary aspirations did not increase significantly from the pre-survey (M=1.42, SD=1.68) to the post-survey (M=1.53, SD=1.61), $t(18) = -0.52, p>.05$.

Feelings Towards New School



Among students who participated in the Transition summer camps (N=19), students did not report reported significantly higher levels of preparedness for transitioning to a new school 1 I understand my class schedule for next year (M=4.29, SD=1.87) to the post-survey (M=4.68, SD=2.16), 2 I will do well in my classes next year (M=6.05, SD=1.08) to the post-survey (M=6.00, SD=1.45), 3 I am excited for next year's classes (M=5.11, SD=1.29) to the post-survey (M=5.84, SD=1.71), 4 I worry about what others think of me (M=3.37, SD=1.95) to the post-survey (M=3.37, SD=2.01), 5 I get nervous when I talk to peers I don't know very well (M=4.33, SD=1.88) to the post-survey (M=4.00, SD=1.97) all $p>.05$.

Stress Reported by Students



When asked to list the different factors that they were worried about for the next academic year, students who attended the Transition Summer Camp decreased significantly in the number of factors they reported worrying about from the pre-survey (M=2.05, SD=1.22) to the post-survey (M=1.16, SD=1.01), $t(18) = 3.03, p=.007$.

Discussion

Overall, researchers found that students who attended the Blugold Beginnings Academic summer programming tend to report higher levels of having set goals they want to reach for the next school year. Students who participated in the STEM summer camp reported significantly more interest in science, technology, engineering, and math, and significantly more certainty in being successful in a science, technology, engineering, or math programs from the pre- to post-survey. Additionally, students who attended the STEM summer programming significantly increased in correctly identifying institutions where someone can earn a degree in science, technology, engineering, or math, and they also significantly increased in their post-secondary aspirations. Finally, students who participated in the 5th-6th grade transition camp reported significantly fewer factors they were worried about from the pre- to post-survey.

However, there were several measures on which students' did not significantly change from the pre- to the post-survey. These included whether they felt they were able to be a good student, their worry about others' opinions of them, and their understanding of why science, technology, engineering, and mathematics are important.

One limitation of this research was that researchers were unable to recruit a control group of students to compare to the students who attended these summer camps. The number of participants within each of these camp cohorts is also relatively small and students who participated self-selected into attending the summer programming.

In the future, researchers would like to establish a control group to survey as a comparison, particularly on measures of students anxiety as they transition into middle school to use as a comparison. Researchers are also interested on following students who attend the summer programming into the academic year to determine whether students tend to remain high on the outcomes measured.

Investigators plan to share the results of the present study with the Blugold Beginnings program staff in an effort to provide feedback on these student outcomes and also in an effort to promote the further development of future summer programming sessions.

References

Alexander, K. L., Entwisle, D. R., & Olson, L. S. (2007). Lasting consequences of the summer learning gap. *American Sociological Review*, 72, 167-180.

Anderson, L. (2003). Academic and social perceptions as predictors of change in middle school students' sense of school belonging. *The Journal of Experimental Education*, 72(1), 5-22.

Cates, J., & Schaeffe, S. (2011). The relationship between a college preparation program and at-risk students' college readiness. *Journal of Latinos & Education*, 10(4), 320-334.

Foster, E., & Savala, L. (2012). Engaging underrepresented youth in food, agriculture and natural resources through pre-college residential summer programs. *NACTA Journal*, 56(2), 38-46.

Greene, R., & Ollendick, T. (1993). Evaluating of a multidimensional program for sixth-graders in transition from elementary to middle school. *Journal of Community Psychology*, 21(2), 162-176.

Knox, K., Moynihan, J., & Markowitz, D. (2003). Evaluation of short-term impact of a high school summer science program on students' perceived knowledge and skills. *Journal of Science Education and Technology*, 12(4), 471-478.

Orfield, G., Losen, D., Wald, J., & Swanson, C., (2004). Losing our future: How minority youth are being left behind by the graduation rate crisis. Cambridge, MA: The Civil Rights Project at Harvard University. Contributors: Advocates for Children of New York, The Civil Society Institute.

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