



# WWC Intervention Report

A summary of findings from a systematic review of the evidence



## Supporting Postsecondary Success

July 2016

# Summer Bridge Programs

## Program Description<sup>1</sup>

*Summer bridge programs* are designed to ease the transition to college and support postsecondary success by providing students with the academic skills and social resources needed to succeed in a college environment. These programs occur in the summer “bridge” period between high school and college. Although the content of *summer bridge programs* can vary across institutions and by the population served, they typically last 2–4 weeks and involve (a) an in-depth orientation to college life and resources, (b) academic advising, (c) training in skills necessary for college success (e.g., time management and study skills), and/or (d) accelerated academic coursework.

## Research<sup>2</sup>

The What Works Clearinghouse (WWC) identified one study of *summer bridge programs* that both falls within the scope of the Supporting Postsecondary Success topic area and meets WWC group design standards. This study meets WWC group design standards with reservations. The study included 2,222 undergraduate students enrolled at Georgia Tech.

The WWC considers the extent of evidence for *summer bridge programs* on the postsecondary outcomes of incoming college students to be small for one outcome domain—degree attainment (college). There are no studies that meet standards that report outcomes in the four other domains, so this intervention report does not report on the effectiveness of *summer bridge programs* for those domains. (See the Effectiveness Summary on p. 4 for more details on effectiveness by domain.)

## Effectiveness

*Summer bridge programs* were found to have potentially positive effects on postsecondary attainment for postsecondary students.

**Table 1. Summary of findings<sup>3</sup>**

Outcome domain	Rating of effectiveness	Improvement index (percentile points)		Number of studies	Number of students	Extent of evidence
		Average	Range			
Degree attainment (college)	Potentially positive effects	+4	na	1	2,222	Small

na = not applicable

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This intervention report presents findings from a systematic review of *summer bridge programs* conducted using the WWC Procedures and Standards Handbook, version 3.0, and the Supporting Postsecondary Success review protocol, version 3.0.

### Program Information

#### Background

The content and target populations of *summer bridge programs* vary widely. For general education students, the goal of *summer bridge programs* is to provide academic support to students that prepares them for college-level work. These programs often feature components that help students navigate the transition to college by providing general information about college life and resources (e.g., the library, activity center, and student health center) and encouraging family member involvement in students' academic support networks. These nonacademic college readiness components are designed to provide cultural and social capital to students and to promote adjustment to college culture. Some *summer bridge programs* for general education students provide accelerated academic experiences as well.

Historically, *summer bridge programs* have targeted ethnic/racial minority, low-income, first-generation, or other student populations deemed at risk of dropping out of college. However, *summer bridge programs* have also been used for all general education students, the focal population for this intervention report.

#### Program details

The *summer bridge program* included in the one study reviewed in this intervention report was implemented at a selective technical university in the southeastern United States. The "Challenge Program" was originally offered in 1981 as a developmental education program for minority students, but since the early 1990s it has operated as a general education *summer bridge program* offered to all incoming students. The program is delivered across a span of 5 weeks for all incoming freshmen. Students in the program participate in short, non-credit-bearing courses in calculus, chemistry, computer science, and English composition, which are designed to resemble college-level for-credit courses. Upperclass students serve as peer educators and coaches during the program and provide supplementary mentoring as needed. To participate in the program, students are required to pay a nominal fee, which is fully or partially refunded based on their GPAs during the *summer bridge program* coursework. The program also aims to integrate family members into students' academic support networks by providing information about college life and attendance at a final awards luncheon.

#### Cost

Murphy, Gaughan, Hume, and Moore (2010) do not report on the costs of the *summer bridge program* included in the one study reviewed in this intervention report.

### Research Summary

The WWC identified 31 eligible studies that investigated the effects of *summer bridge programs* on postsecondary outcomes for postsecondary students. An additional 106 studies were identified but did not meet WWC eligibility criteria for review in the Supporting Postsecondary Success topic area. Citations for all 137 studies are in the References section, which begins on p. 5.

The WWC reviewed the 31 eligible studies against group design standards. One study (Murphy, Gaughan, Hume, & Moore, 2010) used a quasi-experimental design that meets WWC group design standards with reservations. The study is summarized in this report. The remaining 30 studies do not meet WWC group design standards.

**Table 2. Scope of reviewed research**

<b>Grade</b>	Postsecondary
<b>Delivery method</b>	Whole class
<b>Program type</b>	Practice

### Summary of studies meeting WWC group design standards without reservations

No studies of *summer bridge programs* met WWC group design standards without reservations.

### Summary of study meeting WWC group design standards with reservations

Murphy et al. (2010) used a quasi-experimental design to examine the effects of a 5-week *summer bridge program* on students' postsecondary graduation rates. The sample included 2,222 students enrolled at a selective technical university in the southeastern United States. The intervention group included 770 freshmen who elected to participate in a *summer bridge program* in the summer before their first semester of enrollment. The *summer bridge program* involved an academic component that provided short non-credit-bearing courses in calculus, chemistry, computer science, and English composition. Upperclass students served as peer educators and coaches during the program and provided supplementary mentoring as needed. To participate in the program, students were required to pay a nominal fee, which was fully or partially refunded based on their GPAs during the *summer bridge program* coursework. The comparison group included 1,452 students who elected not to participate in the *summer bridge program*. Baseline equivalence of the intervention and comparison groups was established for the following student characteristics specified in the review protocol: students' high-school grade point average and median household income. Follow-up data were collected on the 2,222 students for a minimum of 5 years after initial enrollment.

### Effectiveness Summary

The WWC review of *summer bridge programs* for the Supporting Postsecondary Success topic area focuses on student outcomes in five postsecondary domains: degree attainment (college), college access and enrollment, credit accumulation, general academic achievement (college), and labor market. The one study of *summer bridge programs* that meets WWC group design standards reported findings in one of the five domains: degree attainment (college). The findings below present the authors' estimates of the statistical significance of the effects of *summer bridge programs* for postsecondary students. For a more detailed description of the rating of effectiveness and extent of evidence criteria, see the WWC Rating Criteria on p. 20.

### Summary of effectiveness for the degree attainment (college) domain

**Table 3. Rating of effectiveness and extent of evidence for the degree attainment (college) domain**

Rating of effectiveness	Criteria met
<b>Potentially positive effects</b> <i>Evidence of a positive effect with no overriding contrary evidence.</i>	In the one study that reported findings, the estimated impact of the intervention on outcomes in the <i>degree attainment (college)</i> domain was positive and statistically significant.
Extent of evidence	Criteria met
<b>Small</b>	One study that included 2,222 students in one college reported evidence of effectiveness in the <i>degree attainment (college)</i> domain.

One study that met WWC group design standards with reservations reported findings in the degree attainment (college) domain.

Murphy et al. (2010) reported that postsecondary graduation rates were significantly higher for students in the intervention group, compared to those in the comparison group (70% vs 67%). The WWC characterizes this finding as a potentially positive effect.

Thus, for the degree attainment (college) domain, the study that met WWC group design standards with reservations showed a statistically significant positive effect. This results in a rating of potentially positive effects, with a small extent of evidence.

### References

#### Studies that meet WWC group design standards without reservations

None.

#### Study that meets WWC group design standards with reservations

Murphy, T. E., Gaughan, M., Hume, R., & Moore, S. G. Jr. (2010). College graduation rates for minority students in a selective technical university: Will participation in a summer bridge program contribute to success? *Educational Evaluation and Policy Analysis*, 32(1), 70–83. doi: 10.3102/0162373709360064

#### Studies that do not meet WWC group design standards

Allen, D. F. (2011, May). *Academic confidence and the impact of a living-learning community on persistence*. Paper presented at the annual forum of the Association for Institutional Research, Toronto, Ontario. <http://files.eric.ed.gov/fulltext/ED531717.pdf>. The study does not meet WWC group design standards because equivalence of the analytic intervention and comparison groups is necessary and not demonstrated.

Allen, L. (2001). *An evaluation of the University of Missouri-Rolla minority engineering program 7-week summer bridge program* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 3012945) The study does not meet WWC group design standards because equivalence of the analytic intervention and comparison groups is necessary and not demonstrated.

Appenzeller, E. A. (1998). *Transition to college: An assessment of the adjustment process for at-risk college students* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 9821495) The study does not meet WWC group design standards because equivalence of the analytic intervention and comparison groups is necessary and not demonstrated.

Cabrera, N. L., Miner, D. D., & Milem, J. F. (2013). Can a summer bridge program impact first-year persistence and performance? A case study of the New Start Summer Program. *Research in Higher Education*, 54(5), 481–498. The study does not meet WWC group design standards because equivalence of the analytic intervention and comparison groups is necessary and not demonstrated.

Chism, L. P., Baker, S. S., Hansen, M. J., & Williams, G. (2008). Implementation of first-year seminars, the Summer Academy Bridge Program, and themed learning communities. *Metropolitan Universities*, 19(2), 8–17. The study does not meet WWC group design standards because equivalence of the analytic intervention and comparison groups is necessary and not demonstrated.

Citty, J. M. (2011). *Factors that contribute to success in a first year engineering summer bridge program* (Unpublished doctoral dissertation). University of Florida, Gainesville. The study does not meet WWC group design standards because equivalence of the analytic intervention and comparison groups is necessary and not demonstrated.

Doerr, H. M., Ärlebäck, J. B., & Costello Staniec, A. (2014). Design and effectiveness of modeling-based mathematics in a summer bridge program. *Journal of Engineering Education*, 103(1), 92–114. The study does not meet WWC group design standards because equivalence of the analytic intervention and comparison groups is necessary and not demonstrated.

Douglas, D., & Attewell, P. (2014). The bridge and the troll underneath: Summer bridge programs and degree completion. *American Journal of Education*, 121(1), 87–109. The study does not meet WWC group design standards because equivalence of the analytic intervention and comparison groups is necessary and not demonstrated.

Evans, R. (1999). A comparison of success indicators for program and non-program participants in a community college summer bridge program for minority students. *Visions*, 2(2), 6–14. The study does not meet WWC group design standards because equivalence of the analytic intervention and comparison groups is necessary and not demonstrated.

- Fletcher, S. L., Newell, D. C., Newton, L. D., & Anderson-Rowland, M. R. (2001, November). *The WISE Summer Bridge Program: Assessing student attrition, retention, and program effectiveness*. Paper presented at the Frontiers in Education Conference, Reno, NV. Retrieved from <http://www.foundationcoalition.org/> The study does not meet WWC group design standards because equivalence of the analytic intervention and comparison groups is necessary and not demonstrated.
- Gancarz, C. P., Lowry, A. R., McIntyre, C. W., & Moss, R. W. (1998). Increasing enrollment by preparing underachievers for college. *Journal of College Admission*, 160, 6–13. The study does not meet WWC group design standards because equivalence of the analytic intervention and comparison groups is necessary and not demonstrated.
- Haugen, D. E. (2012). *College transition programs for community college students* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 3511972) The study does not meet WWC group design standards because equivalence of the analytic intervention and comparison groups is necessary and not demonstrated.
- Haight, P. A. (1996, April). *Impact of intervention on disadvantaged first year students who plan to major in health sciences*. Paper presented at the annual meeting of the American Educational Research Association, New York. <http://files.eric.ed.gov/fulltext/ED394468.pdf>. The study does not meet WWC group design standards because equivalence of the analytic intervention and comparison groups is necessary and not demonstrated.
- Hudspeth, M. C., & Aldrich, J. W. (2000, June). *Summer bridge to engineering*. Paper presented at the American Society for Engineering Education Annual Conference and Exposition, Washington, DC. Retrieved from <https://peer.asee.org/8730> The study does not meet WWC group design standards because the measures of effectiveness cannot be attributed solely to the intervention.
- Logan, C. R., Salisbury-Glennon, J., & Spence, L. D. (2000). The Learning Edge Academic Program: Toward a community of learners. *Journal of The First-Year Experience & Students in Transition*, 12(1), 77–104. The study does not meet WWC group design standards because equivalence of the analytic intervention and comparison groups is necessary and not demonstrated.
- Malone, M. S. (2014). *Persistence and success: Summer bridge program effectiveness* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 3621984) The study does not meet WWC group design standards because equivalence of the analytic intervention and comparison groups is necessary and not demonstrated.
- Maples, S. C. (2002). *Academic achievement and retention rate of students who did and did not participate in a university summer bridge program* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 3060379) The study does not meet WWC group design standards because equivalence of the analytic intervention and comparison groups is necessary and not demonstrated.
- Maye, S. J. (1997). *Evaluation of the effectiveness of the Hampton University summer bridge program* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 9733873) The study does not meet WWC group design standards because equivalence of the analytic intervention and comparison groups is necessary and not demonstrated.
- McMinn, H. M. (2004). *Assessment of the college preparatory program: A prediction model and retention study, 1995-2003* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 3151305) The study does not meet WWC group design standards because equivalence of the analytic intervention and comparison groups is necessary and not demonstrated.
- Ohland, M., Zhang, G., Foreman, F., & Haynes, F. (2000, October). *The Engineering Concepts Institute: The foundation of a comprehensive minority student development program at the FAMU-FSU College of Engineering*. Paper presented at the American Society for Engineering Education/Institute of Electrical and Electronics Engineers Frontiers in Education Expo, Kansas City, MO. Retrieved from <http://ieeexplore.ieee.org/>

The study does not meet WWC group design standards because equivalence of the analytic intervention and comparison groups is necessary and not demonstrated.

- Outlaw, J. S. (2008). *Academic outcomes of academic success programs* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 3319077) The study does not meet WWC group design standards because equivalence of the analytic intervention and comparison groups is necessary and not demonstrated.
- Pike, G. R., Hansen, M. J., & Childress, J. E. (2014). The influence of students' pre-college characteristics, high school experiences, college expectations, and initial enrollment characteristics on degree attainment. *Journal of College Student Retention, 16*(1), 1–23. The study does not meet WWC group design standards because equivalence of the analytic intervention and comparison groups is necessary and not demonstrated.
- Prather, E. N. (1996). *Better than the SAT: A study of the effectiveness of an extended bridge program on the academic success of minority first-year engineering students* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 9622371) The study does not meet WWC group design standards because equivalence of the analytic intervention and comparison groups is necessary and not demonstrated.
- Robert, E. R., & Thomson, G. (1994). Learning assistance and the success of underrepresented students at Berkeley. *Journal of Developmental Education, 17*(3), 4–6, 8, 10, 12, 14. The study does not meet WWC group design standards because equivalence of the analytic intervention and comparison groups is necessary and not demonstrated.
- Stewart, J. A. (2006). *The effects of a pre-freshman college summer program on the academic achievement and retention of at-risk students* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 3208076) The study does not meet WWC group design standards because equivalence of the analytic intervention and comparison groups is necessary and not demonstrated.
- Torres, J. D., & Cummings, T. (2000, June). *Minority education in engineering, mathematics and science*. Paper presented at American Society for Engineering Education Annual Conference and Exposition, Washington, DC. The study does not meet WWC group design standards because the measures of effectiveness cannot be attributed solely to the intervention.
- Waller, T. O. (2009). *A mixed method approach for assessing the adjustment of incoming first-year engineering students in a summer bridge program* (Unpublished doctoral dissertation). Virginia Polytechnic Institute and State University, Blacksburg. The study does not meet WWC group design standards because equivalence of the analytic intervention and comparison groups is necessary and not demonstrated.
- Walpole, M., Simmerman, H., Mack, C., Mills, J. T., Scales, M., & Albano, D. (2008). Bridge to success: Insight into summer bridge program students' college transition. *Journal of The First-Year Experience & Students in Transition, 20*(1), 11–30. The study does not meet WWC group design standards because equivalence of the analytic intervention and comparison groups is necessary and not demonstrated.
- Wheatland, J. A. (2000). *The relationship between attendance at a summer bridge program and academic performance and retention status of first-time freshman science, engineering, and mathematics students at Morgan State University, an historically Black university* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 9997415) The study does not meet WWC group design standards because equivalence of the analytic intervention and comparison groups is necessary and not demonstrated.
- Wolf-Wendel, L. E., Tuttle, K., & Keller-Wolff, C. M. (1999). Assessment of a freshman summer transition program in an open-admissions institution. *Journal of the First-Year Experience & Students in Transition, 11*(2), 7–32. The study does not meet WWC group design standards because equivalence of the analytic intervention and comparison groups is necessary and not demonstrated.

### Studies that are ineligible for review using the Supporting Postsecondary Success Evidence Review Protocol

- Adero, C. E. (2015). *Persistence and successful course completion of academically underprepared community college students in the P.A.S.S. program* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 3707555) The study is ineligible for review because it does not use a sample aligned with the protocol.
- Adkins, L. R. (2014). *Impact of an online student bridge program for first-year nontraditional students* (Doctoral dissertation). Minneapolis, MN: Walden University. Retrieved from <http://scholarworks.waldenu.edu/> The study is ineligible for review because it is out of scope of the protocol.
- Anderson, E. G. (2008). *Freshmen retention: The impact of a first year experience program on student satisfaction and academic performance* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 3348688) The study is ineligible for review because it is out of scope of the protocol.
- Anonymous. (2010). Mathematics; IUPUI receives \$2 million to expand state, national science and technology talent pool. *NewsRx Health & Science*, pp. 581. The study is ineligible for review because it does not use an eligible design.
- Arena, M. L. (2013). *Summer bridge programs: A quantitative study of the relationship between participation and institutional integration using Tinto's Student Integration Model at a mid-sized, public university in Massachusetts* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 3597078) The study is ineligible for review because it is out of scope of the protocol.
- Baber, L., Graham, E., Taylor, J. L., Reese, G., Bragg, D. D., Lang, J., & Zamani-Gallaher, E. M. (2015). *Illinois STEM college and career readiness: Forging a pathway to postsecondary education by curbing math remediation*. Champaign, IL: Office of Community College Research and Leadership, University of Illinois at Urbana-Champaign. Retrieved from <http://occrll.illinois.edu/> The study is ineligible for review because it does not use an eligible design.
- Barnett, E. A., Bork, R. H., Mayer, A. K., Pretlow, J., Wathington, H. D., & Weiss, M. J. (2012). *Bridging the gap: An impact study of eight developmental summer bridge programs in Texas* (NCPR brief). New York: National Center for Postsecondary Research, Teachers College, Columbia University. <http://files.eric.ed.gov/fulltext/ED539188.pdf>. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Bettinger, E. P., Boatman, A., & Long, B. T. (2013). Student supports: Developmental education and other academic programs. *Future of Children*, 23(1), 93–115. <http://files.eric.ed.gov/fulltext/EJ1015252.pdf>. The study is ineligible for review because it does not use an eligible design.
- Bisse, W. H. (1994). *Mathematics anxiety: A multi-method study of causes and effects with community college students* (Unpublished doctoral dissertation). Northern Arizona University, Flagstaff. The study is ineligible for review because it does not use an eligible design.
- Boroch, D., & Hope, L. (2009). *Effective practices for promoting the transition of high school students to college: A review of literature with implications for California community college practitioners*. Sacramento: Center for Student Success, Research and Planning Group of the California Community Colleges. <http://files.eric.ed.gov/fulltext/ED519286.pdf>. The study is ineligible for review because it does not use an eligible design.
- Boyd, V. (1996). *A summer retention program for students who were academically dismissed and applied for reinstatement* (Research Report No. 13-96). College Park: Counseling Center, University of Maryland, College Park. <http://files.eric.ed.gov/fulltext/ED405529.pdf>. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Bragg, D. D., & Taylor, J. L. (2014). Toward college and career readiness: How different models produce similar short-term outcomes. *American Behavioral Scientist*, 58(8), 994–1017. The study is ineligible for review because it does not use an eligible design.
- Brown, D. (2000). A model of success: The Office of AHANA Student Programs at Boston College. *Equity & Excellence in Education*, 33(3), 49–51. The study is ineligible for review because it does not use an eligible design.



- Bruch, P. L., & Reynolds, T. (2012). Ideas in practice: Toward a participatory approach to program assessment. *Journal of Developmental Education, 35*(3), 12–14, 16, 18, 20, 22, 34. <http://files.eric.ed.gov/fulltext/EJ998803.pdf>. The study is ineligible for review because it does not use an eligible design.
- Cantor, J. C., Bergeisen, L., & Baker, L. C. (1998). Effect of an intensive educational program for minority college students and recent graduates on the probability of acceptance to medical school. *JAMA: Journal of the American Medical Association, 280*(9), 772–776. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Castleman, B. L., & Page, L. C. (2014). A trickle or a torrent? Understanding the extent of summer “melt” among college-intending high school graduates. *Social Science Quarterly, 95*(1), 202–220. The study is ineligible for review because it is out of scope of the protocol.
- Coleman, A. A. (2011). *The effects of pre-collegiate academic outreach programs on first-year financial aid attainment, academic achievement and persistence* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 3477196) The study is ineligible for review because it does not use an eligible design.
- Cornell, W. C., Tapp, J. B., & Anonymous. (2006). A pre-freshman summer research experience; A recruitment and retention aid. *Abstracts with Programs - Geological Society of America, 38*(7), 459. The study is ineligible for review because it does not use an eligible design.
- Durant, M. (2014). *College resiliency: How summer bridge programs influence persistence in full-time, first-generation minority college students* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 3665080) The study is ineligible for review because it does not use an eligible design.
- Easley, K. (1997). *A bridge to calculus: A textbook for the study of functions and graphs* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 1384834) The study is ineligible for review because it does not use an eligible design.
- Ellis, K. C. (2013). *Ready for college: Assessing the influence of student engagement on student academic motivation in a first-year experience program* (Unpublished doctoral dissertation). Virginia Polytechnic Institute and State University, Blacksburg. The study is ineligible for review because it does not use an eligible design.
- Ellison, H. Y. (2002). *The efficacy of the Ellison model as a retention initiative for first semester freshmen* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 3049781) The study is ineligible for review because it is out of scope of the protocol.
- ERIC Clearinghouse on Higher Education. (2001). *Critical issue bibliography (CRIB) sheet: Summer bridge programs*. Washington, DC: Educational Resources Information Center (ERIC) Clearinghouse on Higher Education, The George Washington University Graduate School of Education and Human Development. <http://files.eric.ed.gov/fulltext/ED466854.pdf>. The study is ineligible for review because it does not use an eligible design.
- Finkelstein, J. A. (2002). *Maximizing retention for at-risk freshmen: The Bronx Community College model*. New York: Bronx Community College. <http://files.eric.ed.gov/fulltext/ED469657.pdf>. The study is ineligible for review because it does not use an eligible design.
- Garcia, L. D., & Paz, C. C. (2009). Evaluation of summer bridge programs. *About Campus, 14*(4), 30–32. The study is ineligible for review because it does not use an eligible design.
- Garcia, S., & Anonymous. (2013). Broadening the participation of the next generation of underrepresented students in geosciences. *Abstracts with Programs - Geological Society of America, 45*(3), 22. The study is ineligible for review because it does not use an eligible design.
- Glenn, J. M. (1997). *An analysis of the effect of intensive instruction on chemistry achievement and mental development of students in a summer bridge program* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 9735955) The study is ineligible for review because it does not use an eligible design.

- Gomez, D. M. (2009). *ACT 101 programs as learning communities: Using the construct of mattering to enhance higher education service delivery* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 3338567) The study is ineligible for review because it is out of scope of the protocol.
- Gregory, S. W. (2009). *Factors associated with Advanced Placement enrollment, Advanced Placement course grade, and passing of the Advanced Placement examination among Hispanic and African American students in Southern California* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 3388679) The study is ineligible for review because it does not use a sample aligned with the protocol.
- Guinn, T. L. (2006). *A second chance to succeed: An exploratory study of a higher education summer bridge/transition entry program at a midwestern university* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 3206633) The study is ineligible for review because it does not use an eligible design.
- Gutierrez, T. E. (2007). *The value of pre-freshmen support systems: The impact of a summer bridge program at UNM* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 3273438) The study is ineligible for review because it does not use a sample aligned with the protocol.
- Hall, E. R. (2008). *Minority student retention program: Student achievement and success program at Anne Arundel Community College* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 3342828) The study is ineligible for review because it does not use a sample aligned with the protocol.
- Hall, J. D. (2011). *Self-directed learning characteristics of first-generation, first-year college students participating in a summer bridge program* (Unpublished doctoral dissertation). University of South Florida, Tampa. The study is ineligible for review because it does not use an eligible design.
- Hall, L. J. (2014). *Supporting community-based summer interventions serving low-income students to narrow the achievement gap: An analysis of the challenges of securing and maintaining funding* (Doctoral dissertation). Retrieved from <http://drum.lib.umd.edu/> The study is ineligible for review because it is out of scope of the protocol.
- Hanlon, E. H., & Schneider, Y. (1999, April). *Improving math proficiency through self efficacy training*. Paper presented at the annual meeting of the American Educational Research Association, Montreal, Quebec, Canada. <http://files.eric.ed.gov/fulltext/ED433236.pdf>. The study is ineligible for review because it does not use an eligible design.
- Hebert, M. S. (1997). *Correlates of persistence and achievement of special program students at a New England regional state university* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 9810513) The study is ineligible for review because it does not use an eligible design.
- Hesser, A., Cregler, L. L., & Lewis, L. (1998). Predicting the admission into medical school of African American college students who have participated in summer academic enrichment programs. *Academic Medicine*, 73(2), 187–191. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Hicks, T. (2005). Assessing the academic, personal and social experiences of pre-college students. *Journal of College Admission*, 186, 19–24. <http://files.eric.ed.gov/fulltext/EJ682486.pdf>. The study is ineligible for review because it does not use an eligible design.
- Hicks, T. L. (2002). *An assessment of the perceptions and expectations of pending college experiences of first-generation and non-first-generation students attending summer pre-college programs* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 3041606) The study is ineligible for review because it does not use an eligible design.
- Hilosky, A., Moore, M. E., & Reynolds, P. (1999). Service learning: Brochure writing for basic level college students. *College Teaching*, 47(4), 143–147. The study is ineligible for review because it does not use an eligible design.
- Homel, S. M. (2013). *Act 101 summer bridge program: An assessment of student success following one year of participation* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 3564815) The study is ineligible for review because it does not use a sample aligned with the protocol.

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**Appendix A: Research details for Murphy et al. (2010)**

Murphy, T. E., Gaughan, M., Hume, R., & Moore, S. G. Jr. (2010). College graduation rates for minority students in a selective technical university: Will participation in a summer bridge program contribute to success? *Educational Evaluation and Policy Analysis*, 32(1), 70–83. doi: 10.3102/0162373709360064

**Table A. Summary of findings** **Meets WWC group design standards with reservations**

Outcome domain	Sample size	Study findings	
		Average improvement index (percentile points)	Statistically significant
Degree attainment (college)	2,222 students	+4	Yes

**Setting** The study took place at a selective technical university in the southeastern United States.

**Study sample** The *summer bridge program* was available to all first-time fall matriculants enrolled at a selective technical university in the southeastern United States between 1990 and 2000. The analytic sample included 770 students who participated in the *summer bridge program* and 1,452 students who did not enroll in the program. Demographically, 38% of the intervention group and 31% of the comparison group were female. The percentage of African-American participants was 80% in the intervention group and 56% in the comparison group. The median neighborhood household income for participants in the intervention group was \$46,646 (in 2000 dollars) and \$49,450 for those in the comparison group. Baseline equivalence of the intervention and comparison groups was established for the following student characteristics specified in the review protocol: students' high-school grade point average and median household income.

**Intervention group** The *summer bridge program* was implemented in the summer before postsecondary enrollment and delivered over the course of 5 weeks in June and July. The program included an academic component and a social component. The academic component included short courses in calculus, chemistry, computer science, and English composition. This coursework was not credit-bearing but was equivalent to the content of freshman-level courses. Participants were graded on their coursework. The intervention also included peer educators or coaches. These were more advanced students who were leaders on campus and who made themselves available to the intervention participants. The social component of the intervention involved integrating families by having family support sessions and awards luncheons that included family members.

**Comparison group** Students assigned to the comparison group did not participate in the *summer bridge program*, but received standard services as usual. Students were free to participate in any other standard university services.

**Outcomes and measurement** Researchers reported one outcome eligible for review under the protocol: graduation from college, which falls in the degree attainment (college) domain. Graduation data were derived from the university's official records and used to measure whether or not students graduated from the university during the follow-up period. All students included in the analytic sample had a minimum of 5 calendar years of follow-up data available, to allow sufficient time for graduation to occur. For a more detailed description of this outcome measure, see Appendix B.

The researchers did not report any other outcomes.

**Support for implementation** The researchers did not report any information on support for implementation.



### Appendix B: Outcome measure for the degree attainment (college) domain

#### Degree attainment (college)

##### *Graduation*

Taken from institutional administrative records, this binary outcome assesses whether students graduated from the university at follow-up (as cited in Murphy et al., 2010). A minimum follow-up time of 5 calendar years was used to allow sufficient time for each participant to graduate (with most students at the university graduating within 5 years). Time to graduation ranged from 3–16 years in the analytic sample.

Appendix C: Findings included in the rating for the degree attainment (college) domain

Outcome measure	Study sample	Sample size	Mean (standard deviation)		WWC calculations			p-value
			Intervention group	Comparison group	Mean difference	Effect size	Improvement index	
<b>Murphy et al., 2010<sup>a</sup></b>								
<i>Graduation</i>	College students	2,222	70%	67%	3%	0.11	+4	.006
<b>Domain average for degree attainment (college) (Murphy et al., 2010)</b>								<b>na</b>

**Table Notes:** For mean difference, effect size, and improvement index values reported in the table, a positive number favors the intervention group and a negative number favors the comparison group. The effect size is a standardized measure of the effect of an intervention on outcomes, representing the average change expected for all individuals who are given the intervention (measured in standard deviations of the outcome measure). The improvement index is an alternate presentation of the effect size, reflecting the change in an average individual's percentile rank that can be expected if the individual is given the intervention. Some statistics may not sum as expected due to rounding. na = not applicable.

<sup>a</sup> For Murphy et al. (2010), no corrections for clustering or multiple comparisons and no difference-in-differences adjustments were needed. The p-value presented here was reported in the original study. The study authors used a Cox proportional hazards model to estimate the effect of the intervention on students' hazard of graduating from college. Proportions presented were provided by the study authors. Effect sizes are computed as a Cox's index: logged-odds ratio transformation divided by 1.65. See the WWC Standards and Procedures Handbook (version 3.0) for the computation of effect sizes for binary outcomes. This study is characterized as having a statistically significant positive effect because the effect for at least one measure within the domain is positive and statistically significant, and no effects are negative and statistically significant. For more information, please refer to the WWC Standards and Procedures Handbook (version 3.0), p. 26.

### Endnotes

<sup>1</sup> The descriptive information for this program was obtained from Murphy et al. (2010). The WWC requests developers review the program description sections for accuracy from their perspective. Further verification of the accuracy of the descriptive information for this program is beyond the scope of this review.

<sup>2</sup> The literature search reflects documents publicly available by August 2015. The studies in this report were reviewed using the Standards from the WWC Procedures and Standards Handbook (version 3.0), along with those described in the Supporting Postsecondary Success review protocol (version 3.0). The evidence presented in this report is based on available research. Findings and conclusions may change as new research becomes available.

<sup>3</sup> For criteria used in the determination of the rating of effectiveness and extent of evidence, see the WWC Rating Criteria on p. 20. These improvement index numbers show the average and range of student-level improvement indices for all findings across the studies.

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## WWC Rating Criteria

### Criteria used to determine the rating of a study

Study rating	Criteria
<b>Meets WWC group design standards without reservations</b>	A study that provides strong evidence for an intervention's effectiveness, such as a well-implemented RCT.
<b>Meets WWC group design standards with reservations</b>	A study that provides weaker evidence for an intervention's effectiveness, such as a QED or an RCT with high attrition that has established equivalence of the analytic samples.

### Criteria used to determine the rating of effectiveness for an intervention

Rating of effectiveness	Criteria
<b>Positive effects</b>	Two or more studies show statistically significant positive effects, at least one of which met WWC group design standards for a strong design, AND No studies show statistically significant or substantively important negative effects.
<b>Potentially positive effects</b>	At least one study shows a statistically significant or substantively important positive effect, AND No studies show a statistically significant or substantively important negative effect AND fewer or the same number of studies show indeterminate effects than show statistically significant or substantively important positive effects.
<b>Mixed effects</b>	At least one study shows a statistically significant or substantively important positive effect AND at least one study shows a statistically significant or substantively important negative effect, but no more such studies than the number showing a statistically significant or substantively important positive effect, OR At least one study shows a statistically significant or substantively important effect AND more studies show an indeterminate effect than show a statistically significant or substantively important effect.
<b>Potentially negative effects</b>	One study shows a statistically significant or substantively important negative effect and no studies show a statistically significant or substantively important positive effect, OR Two or more studies show statistically significant or substantively important negative effects, at least one study shows a statistically significant or substantively important positive effect, and more studies show statistically significant or substantively important negative effects than show statistically significant or substantively important positive effects.
<b>Negative effects</b>	Two or more studies show statistically significant negative effects, at least one of which met WWC group design standards for a strong design, AND No studies show statistically significant or substantively important positive effects.
<b>No discernible effects</b>	None of the studies shows a statistically significant or substantively important effect, either positive or negative.

### Criteria used to determine the extent of evidence for an intervention

Extent of evidence	Criteria
<b>Medium to large</b>	The domain includes more than one study, AND The domain includes more than one school, AND The domain findings are based on a total sample size of at least 350 students, OR, assuming 25 students in a class, a total of at least 14 classrooms across studies.
<b>Small</b>	The domain includes only one study, OR The domain includes only one school, OR The domain findings are based on a total sample size of fewer than 350 students, AND, assuming 25 students in a class, a total of fewer than 14 classrooms across studies.

### Glossary of Terms

<b>Attrition</b>	Attrition occurs when an outcome variable is not available for all participants initially assigned to the intervention and comparison groups. The WWC considers the total attrition rate and the difference in attrition rates across groups within a study.
<b>Clustering adjustment</b>	If intervention assignment is made at a cluster level and the analysis is conducted at the student level, the WWC will adjust the statistical significance to account for this mismatch, if necessary.
<b>Confounding factor</b>	A confounding factor is a component of a study that is completely aligned with one of the study conditions, making it impossible to separate how much of the observed effect was due to the intervention and how much was due to the factor.
<b>Design</b>	The design of a study is the method by which intervention and comparison groups were assigned.
<b>Domain</b>	A domain is a group of closely related outcomes.
<b>Effect size</b>	The effect size is a measure of the magnitude of an effect. The WWC uses a standardized measure to facilitate comparisons across studies and outcomes.
<b>Eligibility</b>	A study is eligible for review and inclusion in this report if it falls within the scope of the review protocol and uses either an experimental or matched comparison group design.
<b>Equivalence</b>	A demonstration that the analysis sample groups are similar on observed characteristics defined in the review area protocol.
<b>Extent of evidence</b>	An indication of how much evidence supports the findings. The criteria for the extent of evidence levels are given in the WWC Rating Criteria on p. 20.
<b>Improvement index</b>	Along a percentile distribution of individuals, the improvement index represents the gain or loss of the average individual due to the intervention. As the average individual starts at the 50th percentile, the measure ranges from -50 to +50.
<b>Intervention</b>	An educational program, product, practice, or policy aimed at improving student outcomes.
<b>Intervention report</b>	A summary of the findings of the highest-quality research on a given program, product, practice, or policy in education. The WWC searches for all research studies on an intervention, reviews each against design standards, and summarizes the findings of those that meet WWC design standards.
<b>Multiple comparison adjustment</b>	When a study includes multiple outcomes or comparison groups, the WWC will adjust the statistical significance to account for the multiple comparisons, if necessary.
<b>Quasi-experimental design (QED)</b>	A quasi-experimental design (QED) is a research design in which study participants are assigned to intervention and comparison groups through a process that is not random.
<b>Randomized controlled trial (RCT)</b>	A randomized controlled trial (RCT) is an experiment in which eligible study participants are randomly assigned to intervention and comparison groups.
<b>Rating of effectiveness</b>	The WWC rates the effects of an intervention in each domain based on the quality of the research design and the magnitude, statistical significance, and consistency in findings. The criteria for the ratings of effectiveness are given in the WWC Rating Criteria on p. 20.
<b>Single-case design</b>	A research approach in which an outcome variable is measured repeatedly within and across different conditions that are defined by the presence or absence of an intervention.

### Glossary of Terms

- Standard deviation** The standard deviation of a measure shows how much variation exists across observations in the sample. A low standard deviation indicates that the observations in the sample tend to be very close to the mean; a high standard deviation indicates that the observations in the sample tend to be spread out over a large range of values.
- Statistical significance** Statistical significance is the probability that the difference between groups is a result of chance rather than a real difference between the groups. The WWC labels a finding statistically significant if the likelihood that the difference is due to chance is less than 5% ( $p < .05$ ).
- Substantively important** A substantively important finding is one that has an effect size of 0.25 or greater, regardless of statistical significance.
- Systematic review** A review of existing literature on a topic that is identified and reviewed using explicit methods. A WWC systematic review has five steps: 1) developing a review protocol; 2) searching the literature; 3) reviewing studies, including screening studies for eligibility, reviewing the methodological quality of each study, and reporting on high quality studies and their findings; 4) combining findings within and across studies; and, 5) summarizing the review.

Please see the WWC Procedures and Standards Handbook (version 3.0) for additional details.



An **intervention report** summarizes the findings of high-quality research on a given program, practice, or policy in education. The WWC searches for all research studies on an intervention, reviews each against evidence standards, and summarizes the findings of those that meet standards.

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