

Evaluating Developmental Education Programs: A Proposed Model and Guidelines for
Higher Education Administrators

Sherri L. Stepp, Director of University College
and
Dr. Ron Childress, Ed. D.
Professor, Ed. D. Program
College of Education and Professional Development
Marshall University

Southern Regional Council on Educational Administration
54th Annual Conference

Oklahoma City, Oklahoma
October 2013

Keywords: Developmental Education, Evaluation
Copyright 2013 Sherri L. Stepp, Ron Childress

Abstract

Evaluating Developmental Education Programs: A Proposed Model and Guidelines for Higher Education Administrators

Higher education faces increasing demands to provide developmental education to a growing population of underprepared high school graduates, nontraditional students, veterans, immigrants, and displaced workers looking to enhance job skills. A number of program models directed at addressing the needs of these populations have emerged. These programmatic investments notwithstanding, colleges and universities have not generally conducted comprehensive evaluations of these programs. This paper will present a theory based model for evaluating such programs, and present findings from in initial implementation of the model at Marshall University. Lessons learned and administrative/policy guidelines for higher education administrators will be provided.

Evaluating Developmental Education Programs: A Proposed Model and Guidelines for Higher Education Administrators

Introduction

State policy makers and institutions of higher education are looking for new recruitment opportunities while challenging current efforts to promote retention in response to the decreasing number of high school graduates and potentially crippling budget cuts. Concurrently, there is a significant amount of national attention directed to developmental education in higher education as one population of students in need of persistence and retention rate increases.

There is a growing movement among colleges and universities who are beginning to view developmental education as an opportunity to help them reach the demands placed upon them for greater retention and degree attainment (Vandal, 2010). Students needing developmental education come from a variety of backgrounds and include students who leave high school underprepared for college, non-traditional students who delay entry into higher education, adults needing additional education for their jobs, veterans, and immigrants (American Association of State Colleges and Universities [AASCU], 2008).

At most colleges and universities, remedial or developmental education involves a model that provides students with extra time to build their skills in English or math with the goal of preparing them for college level courses. While this strategy seems to be based on common sense, the methodology is flawed: “long sequences of fragmented, reductive coursework are not an on-ramp to college for underprepared students, but a dead end” (Charles A. Dana Center, Complete College America, Inc., Education Commission for the States, & Jobs for the Future, 2012, p. 3). In response, schools are looking for alternative models and delivery strategies to reduce the amount of time developmental students need before entering 100-level gateway

courses in English and mathematics. The earlier students enter college gateway courses, the more likely they are to persist to graduation.

The National Association for Developmental Education (NADE, n. d.) defines developmental education as the programs implemented to encourage the development of discipline-specific skills and provide support services for students who have been determined to have skills below what is required for college-level coursework. Traditional developmental education programs include lecture-based classroom instruction. Alternative methods of developmental delivery include summer bridge boot-camp-type programs that offer intense instruction in a short period of time with the opportunity to place into 100-level credit courses, co-requisites linking developmental courses with study skill instruction, supplemental instruction, learning communities, and individual and group tutoring sessions.

Determining the effectiveness of developmental programs, whether traditional or alternative, is difficult. There are innumerable extraneous variables affecting student performance. Lesik (2008) stated that it is nearly impossible to determine that participation in developmental education programs leads to student retention because of the extent of these external factors. Institutions are responsible for utilizing staffing and funding efficiently and effectively; therefore, workable program evaluation models and strategies are needed to assist in providing direction for developmental education programs.

Statement of the Problem

The foundation of developmental education programming should be based on well-assessed best practices; however, Lesik (2006) suggests that the long-term effectiveness of developmental programs has not been adequately evaluated. Lazarik (1997) pointed out that college and university administrators should make developmental education program evaluation

a priority. In doing so, these programs provide gateways for underprepared students to have a second chance at a college education. Lazarik made these comments in 1997 and the climate today is similar but intensified. The College Board Advocacy & Policy Center (2012) notes that the results of the evaluation of developmental education programs are mixed and sometimes reflect that developmental students perform worse than similar students who do not participate in such programs. Now, more than ever, there is an urgent need for colleges and universities to carefully evaluate the level of success of their developmental programs and implement programs that foster growth in persistence and retention goals.

Purposes of the Study

This paper has four objectives. Initially, selected models utilized by colleges and universities to evaluate post-secondary developmental education programs will be identified, compared, and contrasted. Subsequently, the paper will describe an evaluation model for a Summer Bridge Program being implemented in a mid-sized public regional university. Next, findings from the initial implementation of one element of this model will be presented. Finally, guidelines for evaluating developmental education programs will be provided.

A review of these evaluation models can assist colleges and universities in establishing evaluation models on their own campuses that will provide guidance in continuing or altering current developmental programs or implementing new ones. Policymakers and state legislators have acknowledged the opportunity for developmental education programs and are encouraging colleges and universities to establish best practices through well-executed evaluation (Boylan and Bonham, 2007). Proper execution requires continuous assessment and thorough evaluation.

Significance of the Study

The College Board Advocacy & Policy Center (2012) reports that nearly 26% of high school graduates who enter 4-year institutions need math remediation and nearly 25% need writing remediation. While those students may excel in other subjects, they will need additional attention in the problem area(s). Once an educational institution agrees to admit a student, the institution is obligated to provide the support programs that student needs in order to succeed (Veenstra, 2009).

In the current developmental education climate, colleges and universities need to know and understand their students to determine the most cost-effective and promising programs that lead toward persistence and graduation; however, "...retention should be the residual benefit of planning and implementing effective student learning and success initiatives rather than as the purpose of it" (Siegel, 2011, p. 1). The National Center for Developmental Education (2010) issued a resolution in response to the increased demand for program accountability from individual institutions as well as state policy makers. The resolution states:

Therefore it be resolved that the National Association of Developmental Education advocates that institutions provide the necessary support and resources for their developmental education programs to regularly engage in a process of evaluation that includes analyzing data and conducting self-evaluation using recognized professional standards (p. 1).

Thus, there is a need to support the establishment of benchmarks in creating customized developmental education programs along with the development of more stringent policies that efficiently advance students into college-level gateway courses (Education Commission of the States, May 2010).

Literature Review

This literature review provides a brief overview of the developmental education evaluation climate and explores two primary methodologies for evaluating developmental education programs. One method is the logistic regression analysis and the second method is the regression-discontinuity analysis. Although rarely used for the evaluation of developmental education programs due to the ethical nature of the study methodology, a review of a true experimental design is also provided.

Evaluation of Developmental Education

The Education Commission of the States (2011) acknowledges the importance of developmental education program evaluation as institutions strive for innovation and accountability of funding. Program evaluation allows state policymakers to leverage funds to the programs who are effectively meeting goals. The commission urges policymakers to establish performance measures and benchmarking, performance reporting, performance funding, and continuous improvement. Data for benchmarking include remedial course completion, completion of 100-level gateway courses, persistence to second year, and graduation. These items are included in performance reporting along with the program costs. Developmental education programs can be strengthened by continual evaluation of cost productivity and effectiveness.

Boylan (2009) stresses that there are external factors that should be considered when evaluating the success of developmental programs. Student performance can be strongly affected by factors such as the number of hours of work each week, responsibilities outside the classroom such as childcare and financial aid eligibility. Boylan suggests these and other outside factors should be incorporated in the evaluation model.

Educational institutions, however, are reluctant to perform true experimental studies to determine the effectiveness of remedial or developmental programs. To do so, the study would have to withhold the developmental support program from the control group and this could be unethical as well as detrimental to the students' educational goals. Colleges and universities are then faced with finding alternate evaluation methods (Lesik, 2008).

Evaluating Developmental Education Programs with a Logistic Regression Analysis

According to the United Nations Educational, Scientific and Cultural Organization (n. d.), a regression analysis explores a relationship between a dependent variable and one or more independent variables. Lesik (2008) discusses the use of a logistic regression analysis to determine a causal relationship between student success and the utilized developmental support program. In this method, the researcher would define multiple factors that might impact a student's persistence toward graduation. One of the dichotomous variables would be participation in the developmental program. "Based on the results of the regression analysis, researchers will make conclusions about whether or not they believe the developmental program is effective in keeping students in college by interpreting the estimate of the coefficient of the dichotomous treatment variable" (p. 3).

Bettinger and Long (2009) obtained data for more than 28,000 students from the Ohio Board of Regents. The student population included traditional-aged Ohio undergraduate students who entered college in Fall 1998 and the group was studied for a period of six years. Since Ohio schools did not use consistent measures for remediation requirements, the researchers utilized a series of variables such as gender, race, age, family financial status, type of high school attended, standardized test scores, high school GPA, high school math GPA, and the number of math courses taken in high school to predict whether or not the student was likely to participate in

remediation at the closest college to their home. Using a regression analysis, their research concluded that students who participated in the developmental program performed better than students with like backgrounds who did not participate in the program. They found increased college persistence in the treatment group.

Evaluating Developmental Education Programs with Regression-Discontinuity Analysis

The Web Center for Social Research Methods (n. d.) describes the regression-discontinuity design as a strategy to assign students to the treatment group based on a score slightly below a previously established cut-score and to the control group based a score slightly above the cut-score. This evaluation method closely imitates the true random experimental design that is elusive to developmental education evaluators. By using a pretest with a predetermined, exogenous assignment variable, such as a placement exam or other diagnostic test with a defined cut-score, nearly equivalent groups can be established by assigning those closest to the upper side of the cut-score in a control group and those on the lower side as the experimental group (Lesik, 2008). This eliminates the ethical concerns as no support program would be withheld from students needing the education program. By using this method, the researcher can determine the causal relationship of the treatment program because it makes the assumption that students who score slightly above and below the established cutoff would be identical except for the exposure to the developmental program. (Lesik, 2006).

Using a regression discontinuity design, Martorell and McFarlin (2007) conducted a study on Texas students utilizing data from the Texas Higher Education Coordinating Board (THECB). Data reviewed included performance in the first college-level mathematics course, credit hours attempted and degree or certificate attainment with the primary variable being whether or not the student participated in remediation. The data included information on

students who entered college as first-year students between 1991-1992 and 1999-2000 and each student's academic progress was tracked for six years. The research design utilized a placement exam score as the assignment variable for the regression discontinuity analysis.

Martorell and McFarlin state that it is unlikely that the effect of remediation would be the same for all students. For this reason, they incorporated an estimate of an average treatment effect into their study results and noted that this information is most informative for students who score closest to the placement cut-score and are considered to be marginal students. Martorell and McFarlin believe that the marginal students are "policy relevant" for three reasons: (1) a large portion of students were tested close to the cut-score; (2) policymakers understand that the developmental programs are intended for those students who are just below the cut-score because students significantly below the cut-score are not expected to be successful; and (3) policymakers can use the information to determine if the cut-score is established at the correct level. For students near the cut-score, Martorell and McFarlin's study found little effect on student performance. The finding is significant for two- and four-year students as well as student subgroups. The researchers fully understand the impact of the results by noting that the substantial cost for the program is not justified by the benefit.

Moss and Yeaton (2006) note that the regression-discontinuity design for evaluating developmental education can be used to develop policy decisions but can be conducted with little cost and effort while maintaining a rigorous methodology. There is no need to do any additional data collection. The data utilized in a regression-discontinuity design should be readily available to the evaluator. By using the predetermined placement cut-score and selecting students just above and below that score, you can make the assumption that all other factors are reasonably consistent in the control and study groups. In many of the weaker methods, Moss and Yeaton

argue, there is no consideration of group differences prior to the program and when evaluating only the results of the developmental program participants, there is no control group for comparison. Comparatively, Zachry (MDRC, 2008) notes that regression-discontinuity evaluation models fail to find a causal relationship between the program and student success, but can identify effective trends. These trends can help colleges and universities determine whether or not to continue support to a particular program.

Evaluation of a Summer Bridge Program with an Experimental Design

The National Center for Postsecondary Research chose Texas for a developmental education study because the state has embraced the summer bridge format for addressing student needs in developmental education and this model lends itself to an experimental design. The study was conducted at eight Texas schools including seven community colleges and one open admission university. Thirteen hundred students were divided into study and control groups. The study group attended bridge programs that included focused instruction for three to seven hours per day for a time period of four to five weeks and students received instruction in one discipline area along with additional academic support, accelerated instruction, and college transition information (Bradley, 2012).

According to Bradley (2012), the National Center for Postsecondary Research found inconclusive results. The control group and the study group enrolled in a similar number of course credits in their first semesters. The study found that students who completed bridge programs were more likely than control group students to pass the college-level math and writing courses in a period of five semesters after the bridge program, but the results diminished after two years. The gains were short-term, like a “booster shot” (p. 6). There was no evidence that bridge program participation increased persistence.

Evaluating the Evaluation Methodologies

Garcia and Paz (2009), graduate students and former participants in a summer bridge program, conducted a literature review and concluded that there is little evidence of comprehensive evaluation of programs like the one in which they participated. They argued that in addition to university officials and state policymakers, the primary stakeholders are the students and, because of their vulnerabilities as developmental students, they need to see the clear evidence regarding participant success and persistence.

Feldman and Zimbler (2012) acknowledge that many students are shocked when they discover they are unprepared for college level courses. Oftentimes, they are not aware of their unpreparedness until they take their initial placement examinations. In many cases, this knowledge affects the self-esteem of the student and immediately places a road-block on their path toward a degree. Colleges and universities should consider the student vulnerabilities and not ask students to participate in programs that have proven to be ineffective.

The discussion about the lack of rigorous evaluation methods is common in the literature. Collins (2010) notes that the practitioner-oriented researchers rely on surveys, observations and interviews to determine the effectiveness of programs. This type of research leads to what is generally called best practices. Experimental and quasi-experimental research comparing intervention and control groups falls on a continuum of positive impact, moderate impact, no impact, and negative impact on the developmental participants.

Collins emphasizes that all researchers, whether utilizing experimental or non-experimental designs, keep in mind the factors beyond the classroom that affect student performance. Researchers risk finding a false-positive result when he or she concludes the program had a significant impact. A researcher could also find a false-negative result. The

number of extraneous factors is overwhelming and nearly impossible to define but certainly result in misleading or inaccurate evaluation findings. Both types of research methods struggle to find the causal relationship between the intervention and the results.

Effective evaluation methodologies need to be implemented to ensure that programs are both cost effective and successful in retaining students. The logistic regression analysis compared the effectiveness of the developmental treatment for students with similar external factors and found the treatment to be successful. The regression-discontinuity analysis found little difference in the success of students slightly above or below the established cut-scores. An optional summer bridge program provided the means for a true experimental evaluation which found increased persistence shortly after completion of the program, but the results diminished over time.

Based on the literature review for this paper, there is no overwhelming evidence to support a particular methodology for evaluating developmental education programs. The literature review falls short of declaring any particular method successful in all situations. Many questions remain on the effectiveness of the evaluation methodologies.

A Proposed Evaluation Model: The Summer Bridge Program at Marshall University

Program Model and Theory of Change

The program and theory of change model for the Summer Bridge Program is included as Exhibit A. Bridge Program resources include the participating students, their parents, the implementation staff, the faculty instructors, the physical facilities, program publicity, and university funding. A description of the targeted participants includes incoming freshmen students needing developmental coursework. The implementation staff included Academic

Affairs, the Office of Recruitment, and University College. Instructors with developmental education experience were recruited from the mathematics and English departments. Staff secured classrooms and computer labs through the Office of the Registrar and the Office of Facilities Scheduling.

Interventions included a pre-test Accuplacer placement exam for mathematics and an in-house writing exam for English on the first day of the program. Students received instruction each morning and additional activities after lunch. Additional tutoring was available in the University Tutoring Center in the afternoons. On the last day of the program, students completed a post-test placement exam. Information about campus, housing and other services were intertwined with the instructional activities.

The short-term program goals included improved skills, improved pass rates for developmental courses, improved pass rates for 100-level gateway courses, and increased campus engagement. Mid-term expectations included persistence to second year of enrollment and a long-term goal was focused on improving the graduation rate for students needing developmental education in math and English.

The Marshall University Summer Bridge Program was implemented in the summer of 2012. The Bridge Program included intensive math and English workshops purposefully designed to help students learn or refresh the skills needed to pass a placement exam for entry into 100-level gateway courses in their first semester. The target participants were admitted freshmen scheduled to enroll in Fall 2012 who needed developmental math and/or English. A secondary group of participants included conditionally admitted students in danger of dismissal from the University if placement in 100-level math was not achieved by the end of the fall 2012 semester.

The first session was held in June and the second in July. The math and English programs ran concurrently. If a student needed both math and English remediation, he or she could participate in both the June and July programs. Each session consisted of 8-day workshops with intensive instruction in the morning, a break for lunch and individual lab-type work in the afternoons. Instructors administered placement exams on the first and last day of the sessions to measure improvement and determine the placement level for fall enrollment.

The Evaluation Model

The political environment is somewhat tense in regard to developmental education. The West Virginia Higher Education Policy Commission has mandated that state colleges and universities reconsider their developmental education practices and preliminary documents indicate that a significant increase in the success rate will be desired in a short period of time. In the near future, West Virginia colleges and universities will receive funding through a performance-based allocation model which ties funding to student graduation rates (West Virginia College Completion Task Force, 2012), thus, the urgent need to support this population of students. This setting should not affect the evaluation of the program but provide the necessary support needed to conduct the evaluation.

Programs such as the Summer Bridge are implemented with the intent that certain activities will result in defined benefits to the participants. The evaluation design used in this program is a theory-based model based on the work of Rossi, Lipsey, and Freeman. In order for a program to be successfully evaluated, the authors believe the evaluator must be able to identify the program goals and objectives, recognize the concerns of the stakeholders, and understand the anticipated benefits. This theory-based evaluation approach includes the impact theory, the service utilization plan, and the organizational plan. The program's impact theory is the

anticipated cause-and-effect relationship between the activities and the desired benefits. A service utilization plan includes the assumptions about reaching the target population and providing the prescribed activities. The organizational plan defines the relationship between the personnel, the resources, the facilities, and the delivery of the service (2004).

The goals of evaluating the entire bridge program are to determine the level of success in summer 2012 and determine areas for improvement or change while there is time to make such changes for Summer 2013. Success would be indicated by a higher percentage of students entering 100-level gateway courses in the subsequent fall semester, but evaluators must also consider the success of students in those courses. If the students are not successful, the program may have lost ground by placing them in the courses. The long-term goals of persistence and graduation cannot be immediately assessed; however, the plan includes a strategy for measuring persistence one-year from matriculation and graduation after four, five, and six years. University staff would be provided to conduct the evaluation. The cost would require staff time and printing and copying costs.

Evaluation Questions and Data Collection

Framework for Evaluation Questions table is provided as Exhibit B. The table addresses the questions that will be answered during the program evaluation, the data that will need to be collected to answer the evaluation questions, a brief description of the data collection methodologies that will be used, the time schedule for collecting the data, and the reporting requirements. Survey data to be collected will be developed into one comprehensive survey for each category of stakeholders. Surveys will be distributed at the conclusion of the program and results prepared after a designated response time. Available data regarding expenses, completion of program, and other relative program statistics will be collected and analyzed at the conclusion

of the program. Additional longitudinal studies will be conducted for student persistence one year after matriculation and graduation rates will be evaluated at four, five, and six years after matriculation.

Initial Model Implementation

The initial implementation of the evaluation model was a project focused on the development and administration of a student satisfaction and impact survey designed specifically for the math participants in the 2012 Summer Bridge program. The survey included nine multiple choice questions, twelve Likert Scale responses, and four open-ended questions. Survey questions were drafted and reviewed by several key stakeholders. The survey instrument was created in Qualtrics, an electronic survey program. A printed copy of the survey instrument is available in Exhibit C.

The survey instrument was distributed to all participants in the math sessions in the Summer Bridge 2012. The survey notification was sent to 120 Summer Bridge Program participants via Marshall University email accounts. The email included the IRB approved consent form and an invitation to follow a link to the electronic survey created in Qualtrics. The original response time was scheduled for two weeks. Three additional requests yielded a final total of 37 responses, a 30.8 percent response rate.

The survey project included some limitations. Some respondents may not have been comfortable with the electronic format and choose not to complete the survey or fail to navigate the survey properly. Another limitation might have been the respondent's frame of mind at the time of the survey. The survey was also administered several months after the program ended. The lack of timeliness could have contributed to the low response rate.

Survey Findings

The survey sought to determine differences based on whether or not a student was a traditional-aged college student or non-traditional. Of the 37 respondents, 32 (91%) indicated they were traditional-aged in the range of 18 – 23 years old. Two (6%) respondents indicated an age range of 24 – 35 years old and one respondent (3%) indicated an age range of 46 – 55 years old. Survey respondents were primarily freshmen (95%) matriculating in Fall 2012. The majority of respondents (69%) attended the program at the Huntington campus, 20% percent attended at the South Charleston location, and 11% attended at the Mid-Ohio Valley Campus in Pt. Pleasant.

The study also sought to determine whether or not the math participants continued in math courses in their first semester of enrollment at Marshall University. Questions were separated by 100-level, credit-bearing courses (MTH 121 or MTH 127), and developmental courses (MTH 098 or MTH 099). Survey findings indicate that 27% of respondents enrolled in MTH 121 or MTH 127 and 78% of respondents enrolled in MTH 098 or MTH 099. Error in the self-reporting is evident as this would reflect that 105% of students enrolled in a math course in the fall semester. Two respondents also indicated enrollment in both level of courses.

Of the 10 respondents reporting enrollment in 100-level math, six self-reported receiving a grade of C or higher. There were no grades of D reported. The self-response data reflect a pass rate of 60%. Four respondents indicated a grade of F, a grade of incomplete, or a withdrawal. Of the 29 respondents reporting enrollment in a developmental course, 25 reported receiving a grade of Credit (CR), three reported a grade of No Credit (NC), and one reported a withdrawal. The pass rate for the developmental courses was self-reported at 86%.

Participants were asked to respond in regard to the logistics of the Summer Bridge Program. Seventy-seven percent of respondents indicated that the program starting time was the right time while 23% would have preferred an earlier or later time. Seventy percent of respondents indicated the length of the instructional day was the right length of time. Sixty-five percent of respondents indicated they believed the number of instructional days was correct while 24% percent indicated the length of the program was too short and 11% indicated the program length was too long.

Respondents were asked to identify how they found out about the Summer Bridge program. The majority of the respondents (59%) found out about the program via a direct mail postcard from Marshall University. Parents were responsible for providing information for 19% of the respondents. Eight percent were told about the program by a friend or another student and no one found out about the program on the Marshall University Website. Fourteen percent indicated other sources including the Student Resource Center, or their college of business advisor, high school counselor, and their advisor when they received their course schedule.

Participants were asked to indicate their level of agreement on twelve statements regarding elements of the Summer Bridge Program. The scale was a four-point scale in which Strongly Disagree = 1, Disagree = 2, Agree = 3, and Strongly Agree = 4. The mean values for the twelve items ranged from 2.75 to 3.54 indicating that the majority of the respondents agreed or strongly agreed with the statements provided. The standard deviation ranged from 0.67 to 1.08. Table 1 includes the ratings per individual element.

The respondents were in least agreement with the program content matching the content on the placement exam (Mean=2.75). Respondents were in highest agreement with convenient parking and recommending the program to other students (Mean=3.53 and 3.54, respectively).

Participants reported program strengths in open-ended response questions. They indicated that participants found the instructors to be helpful, they liked the provided teaching materials, and several indicated improvement in math skills. Reported weaknesses related to the logistics of the program such as time of day, length of class, and length of instruction. Some believed to instruction time to be too long while others thought it was too short and would have liked to have seen more material covered. Some respondents also reported that the content covered in the course did not prepare them to take the placement exam.

When asked to submit suggestions to improve the program, many respondents replied that they liked the program and would not recommend any changes. Some respondents recommended changing the length of daily instructional time and others recommended changing the number of instructional days. A few respondents recommended that more material be covered in the program to meet the demands of the placement exam.

Conclusions

This paper addressed four objectives in relation to the evaluation of developmental education. The first objective was to identify, compare, and contrast selected models used to evaluate post-secondary developmental education programs. Examples of a logistic regression analysis model, a regression-discontinuity model, and a true experimental model were reviewed. In the literature reviewed for this paper, there was little evidence to support a particular evaluation methodology.

The second objective was to describe a proposed evaluation model for a Summer Bridge Program implemented in a mid-sized public regional university. A comprehensive evaluation model has been presented. The Program Model and Theory of Change is presented in Exhibit A and the Framework for Evaluation Questions is presented in Exhibit B.

A third objective included the implementation of a student satisfaction survey as one element of the proposed evaluation model. Findings from that survey reflected a pass rate of 60% in 100-level courses and a pass rate of 86% in the developmental courses. These data should be compared with University grade data available at the conclusion of the first semester of enrollment. The data are unable to answer whether or not participants improved their math skills; however, 29 respondents agreed or strongly agreed that participation in the Summer Bridge Program improved their math skills. Survey responses reflect a general agreement that the program improved math skills, the instructors were knowledgeable and helpful, the usefulness of the class materials and the logistics of the program. Thirty-two respondents agreed or strongly agreed that they would recommend the program to other students.

After a review of the survey data, the researcher was dismayed that the original survey questions could be better addressed by analyzing the Summer Bridge Program participant data available at the conclusion of the program; however, the impact data are still valuable. Additional longitudinal analysis should occur at the conclusion of the respondents' first and second semesters of enrollment to determine success rates in gateway courses.

A final objective of this paper was to present guidelines and recommendations for university administrators who are considering implementing and evaluating developmental educational programs (See Table 2). It is essential that program objectives and goals be clearly defined and understood by all stakeholders. If this cannot be determined, the university administration should consider changing the program.

Guidelines and Recommendations

In consideration of current budget challenges, it is essential that developmental programs, whether traditional or alternative in nature, be evaluated to determine effectiveness. University

administrators can justify funds spent on evaluation by the confirmation that program goals and objectives were attained. If the attainment of goals and objectives cannot be confirmed, it is essential that programs to be reconsidered. Rossi et al. (2004) established a set of recommendations for redesigning a program. Reconstructing a program might include “(1) clarifying goals and objectives; (2) restructuring components for which the intended activities are not happening, needed, or reasonable; (3) working with stakeholders to obtain consensus about the logic that connects program activities and the desired outcomes” (p. 165).

Table 2 includes a summary of specific recommendations determined as a result of this study. Recommendations are organized into three categories: program design, evaluation design, and survey design.

Implications for Further Research

While there are a number of best practices emerging in the field of developmental education, Bailey (2009) states that available research provides some guidance but there is little data to support the effectiveness of particular programs. In response to the lack of consensus, the National Association for Developmental Education has established a set of goals for developmental education programs. These goals include preserving opportunity for students, accurate placement in courses, development of skills and attitudes appropriate to the learning and career environments, development of skills essential to successful completion of college-level courses, and student retention.

States have utilized different measures to evaluate themselves on the success of developmental programs. Methods include the number of students who passed a final exam, passed a developmental course, the number of students who have utilized developmental services and even satisfaction surveys. As a result of the inconsistent evaluation methods, it is not

possible to compare the inconsistent data that currently exists at the state level. In response, in the *Criteria for Program Evaluation* (n. d.), the National Association for Developmental Education (NADE) made specific recommendations for the implementation of industry standards for developmental education evaluation. Recommendations for quantitative and qualitative strategies are provided in the Exhibit D (National Center for Developmental Education, n. d.).

Professional associations and agencies have long promoted the importance of the evaluation of developmental education programs. Program evaluation promotes student success. To meet the recent challenges above, institutions need to implement systematic and ongoing evaluation to investigate all program components (Boylan, Bliss, & Bonham, 1997). The Education Commission of the States (2010) clearly notes that states are not operating on industry standards. The implementation of a systems approach could help colleges and universities who will be forced to reform their developmental education programs as states reduce funding for postsecondary education. Institutions will need to be creative in developing new developmental strategies in consideration of performance funding based on established benchmarks. Continued implementation of developmental education evaluation methods can be essential to meeting those student success benchmarks.

Closing Comments

In his Address to the Joint Session of Congress in 2009, President Barack Obama challenged U.S. citizens to make a commitment to enrolling in some form of higher education. He further promised them that "...we will provide the support necessary for you to complete college and meet a new goal: by 2020, America will once again have the highest proportion of college graduates in the world" (Obama, 2009, para. 66). To meet President Obama's target, colleges and universities must employ effective student support programs that foster persistence

and retention. Educational institutions must provide the funding and staff to adequately evaluate all support programs including remedial and developmental education programs.

The Education Commission of the States has established that adequately addressing the needs of developmental students is a critical strategic avenue for increasing the number of college degrees attained. The Commission further states that developmental education has the potential to be a driving force in how postsecondary institutions provide education to diverse populations (2010).

With President Obama's challenge and the need for individual institutions to increase retention, colleges and universities must put themselves in a position to support and develop populations of students who have in the past slipped through the cracks. Students needing developmental education represent a large population of students who have not been adequately supported by college and universities. It is time for colleges and universities to implement regular evaluation of current delivery of developmental programs and strategically employ creative and effective opportunities to help these students meet their personal and career goals. When individual goals are met, perhaps we can attain the collective goal.

References

- American Association of State Colleges and Universities. (2008, August). *Enhancing college student success through developmental education*. Washington, DC: Russell, A.
- Bailey, T. (2009). Challenge and opportunity: Rethinking the role and function of developmental education in community college. *New Directions for Community Colleges*, 145, 11-30.
- Bettinger, E. P., & Long, B. T. (2009). Addressing the needs of underprepared students in higher education. *The Journal of Human Resources*, 44(3), 736-771.
- Boylan, H. R. (2009, Spring). Targeted intervention for developmental education students (T.I.D.E.S.). *Journal of Developmental Education*, 32(3), 14-23.
- Boylan, H. R., & Bonham, B. S. (2007, Spring). 30 years of developmental education: A retrospective. *Journal of Developmental Education*, 30(4), 2 – 4.
- Boylan, H. R., Bliss, L., & Bonham, B.S. (1997, Spring). Program components and their relationship to student performance. *Journal of Developmental Education*, 20(3), 1- 10.
- Bradley, P. (2012, July 9). School is in for summer: Study shows college bridge programs yield mixed results. *Community College Week*, 6 – 7.
- Charles A. Dana Center, Complete College America, Inc., Education Commission for the States, & Jobs for the Future. (2012, December). *Core principles for transforming remedial education: A joint statement*. Author not listed.
- College Board Advocacy & Policy Center. (2012). *Collegiate remediation: A review of the causes and consequences*. New York, NY: Kurlaender, M., & Howell, J. S.

- Collins, M. L. (2010, Fall). Bridging the evidence gap in developmental education. *Journal of Developmental Education*, 34(1), 2-8.
- Education Commission of the States. (2011, January). *Getting past go: Accountability & continuous improvement in remedial education*. Denver, CO: Smith, M.
- Garcia, L. D. & Paz, C. C. (2009, September-October). Evaluation of summer bridge programs. *About Campus*, 30 – 32.
- Lazarik, L. (1997). Back to the basics: Remedial education. *Community College Journal*, 11 – 15.
- Lesik, S. A. (2006). Do developmental mathematics programs have a causal impact on student retention? An application of discrete-time survival and regression-discontinuity analysis. *Research in Higher Education*, 48(5), 583- 608.
- Lesik, S. A. (2008). Evaluating developmental education programs in higher education. *ASHE/Lumina Policy Briefs and Critical Essays No. 4*. Ames: Iowa State University, Department of Educational Leadership and Policy Studies.
- Martorell, P. & McFarlin, I. (2007). *Help or hindrance? The effects of college remediation on academic and labor market outcomes*. Unpublished manuscript.
- MDRC. (2008, December). *Promising Instructional Reforms in Developmental Education: A Case Study of Three Achieving the Dream Colleges*. New York, NY: Zachry, E. M.
- Moss, B. G., & Yeaton, W. H. (2006). Shaping policies related to developmental education: An evaluation using the regression-discontinuity design. *Educational Evaluation and Policy Analysis*, 28, 215 – 229.
- National Association for Developmental Education. (n. d.). *Developmental Education*

- Goals and Definition*. Retrieved from: <http://tncc.edu/VADE/NADEpurpose.pdf>
- National Center for Developmental Education. (2010). *Need for systematic ongoing evaluation in developmental education*. Goodyear, AZ: Author not listed.
- National Center for Developmental Education. (n. d.). *Criteria for program evaluation*. Goodyear, AZ: Boylan, H. R., & Bonham, B. S.
- Obama, B. H. (2009). *Remarks of President Barack Obama—As Prepared for Delivery: Address to Joint Session of Congress*. Retrieved from: http://www.whitehouse.gov/the_press_office/Remarks-of-President-Barack-Obama-Address-to-Joint-Session-of-Congress.
- Rossi, P. H., Lipsey, M. W., & Freeman, H. E. (2004). *Evaluation: A systematic approach* (7th Ed). Thousand Oaks, CA: Sage Publications, Inc.
- Siegel, M. (2011, January-February). Retention problem: Moving our thinking from end-product to by-product. *About Campus*, 8-18.
- United Nations Educational, Scientific and Cultural Organization. (n. d.). *4.4 Regression Analysis*. Retrieved from: http://www.unesco.org/webworld/idams/advguide/Chapt4_4.htm.
- Web Center for Social Research Methods. (n. d.). *The Regression-Discontinuity Design*. Retrieved from: <http://www.socialresearchmethods.net/kb/quasird.php>.
- West Virginia College Completion Task Force. (2012, May). *Educating West Virginia is everyone's business*. Author not listed.
- Veenstra, C. P. (2009, January). A strategy for improving freshman college retention. *The Journal for Quality & Participation*, 19-23.

Exhibit A: MU Summer Bridge Program Model and Theory of Change

MU Summer Bridge Program Model and Theory of Change

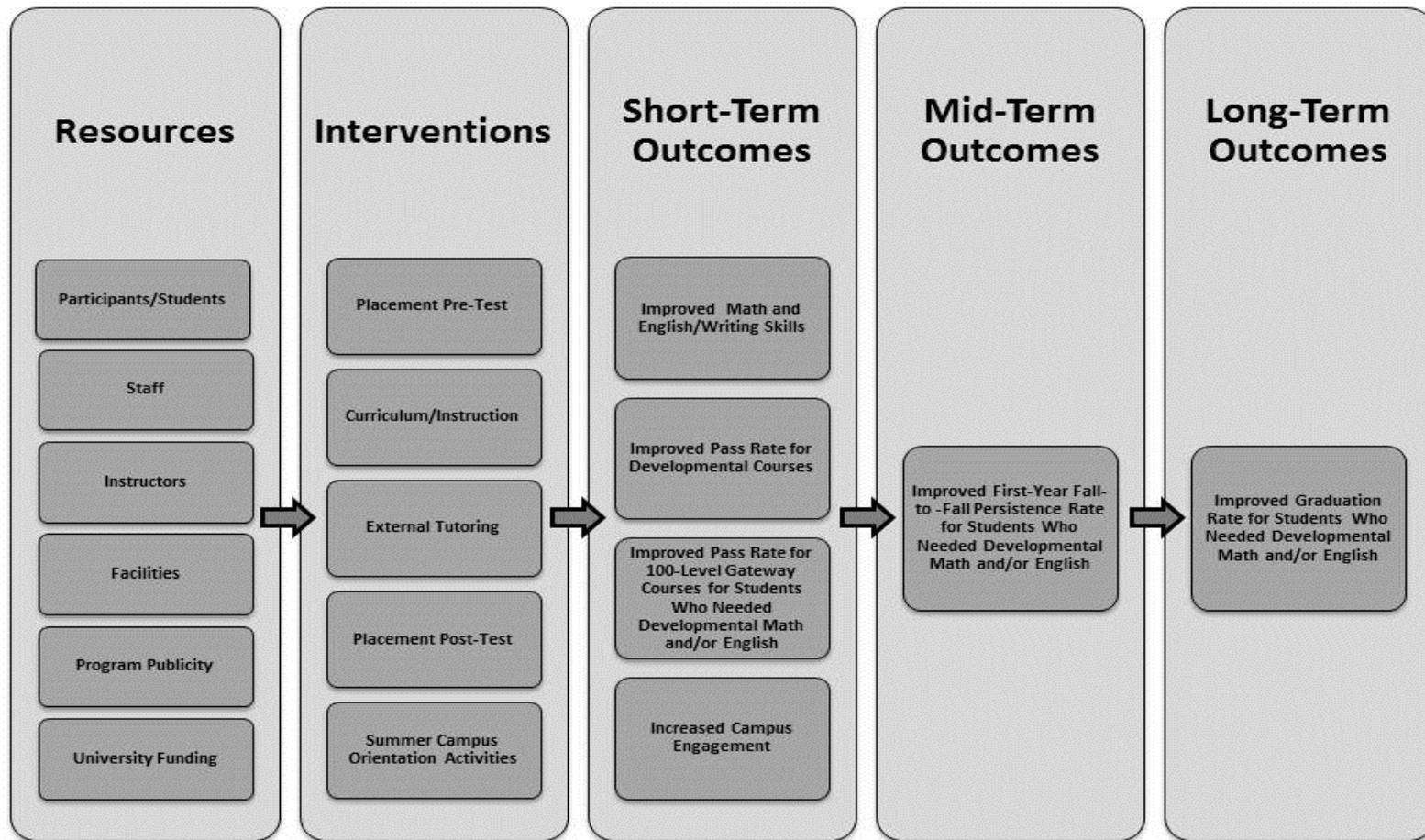


Exhibit B: Framework for Evaluation Questions

Evaluation Questions	Data to be Collected	Data Collection Process/Strategy	Data Collection Schedule	Reporting Requirements
A. Need for Program				
What is the nature and extent of the need for this program?	Number of MU students needing developmental coursework	Student Data Base	Available upon request	Program outcomes annually at the conclusion of the program
	Comparison to National, State and Peer School Data	Research (Complete College America)	Available upon completion of a literature review	
	Success rate of students in current developmental courses	Student Data Base	Available upon request	
How does this program relate to other initiatives, new or old?	Description of other alternatives for students needing developmental coursework	Description of Current Courses, Placement Exams, Upcoming Pilot Programs, etc. (MU Catalog)	Available upon request	
What are the characteristics of the population of students for whom this program is designed?	First Generation HS GPA Standardized Test Scores Socio-Economic Status Sex/Gender	Student Data Base Student Data Base Student Data Base Student Data Base Student Data Base	Available upon request	
What are the “local conditions” in relation to the program?	Program Support by Math Dept. Program Support by English Dept. Program Support by Academic Affairs Program Support from Students Program Support from Parents Program Support from Coordinators	Survey of Math Dept. Instructors Survey of English Dept. Instructors Survey of Acad. Affairs Administrators Survey of Students Survey of Parents Survey of Program Coordinator	Surveys to be completed at the conclusion of the program	

B. Program Design / Conceptualization				
Is the model designed to meet the needs of population? Is it plausible?	Participant Selection Process	Program Procedures and Student Data Base	Available upon request	Program outcomes annually at the conclusion of the program
Is the model consistent with University and state (WVHEPC) policies?	Marshall University Placement Policy WVHEPC Policy	Comparison of Bridge Program and Applicable Policies	Available upon completion of a literature review	
Are the interventions consistent with mission of the University?	Program Mission Statement and Marshall University Mission Statement	Program Guidelines, Marshall University Catalog	Available upon completion of a literature review	
Are resources sufficient to meet the needs of the model?	Funding Data	Program Budget and Expenses	Available at the conclusion of the program	
C. Program Operation / Implementation				
Do all stakeholders know what is expected of them?	Expectations of Math Dept. Expectations of English Dept. Expectations of Academic Affairs Expectations of Students Expectations of Parents Expectations of Coordinators	Survey of Math Dept. Instructors Survey of English Dept. Instructors Survey of Acad. Affairs Administrators Survey of Students Survey of Parents Survey of Program Coordinators	Surveys to be completed at the conclusion of the program	Program outcomes annually at the conclusion of the program
Is the rationale for the program clear to all stakeholders?	Understanding of Math Dept. Understanding of English Dept. Understanding of Academic Affairs Understanding of Students Understanding of Parents Understanding of Coordinators	Survey of Math Dept. Instructors Survey of English Dept. Instructors Survey of Acad. Affairs Administrators Survey of Students Survey of Parents Survey of Program Coordinators	Surveys to be completed at the conclusion of the program	
Do the instructors follow the implementation instructions?	Instructor Implementation Methods Actual Implementation	Review of Implementation Instructions Comparison with Actual Methods Implementation as described via an Instructor Survey and Observation	Evaluator observations during program Surveys to be completed at the conclusion of the program	

Did the facilities allow for a comfortable and effective teaching and learning environment?	Description of Facilities Instructor and Student Opinions Regarding Facilities	Room Descriptions from Facilities Planning Survey of Students Survey of Math & English Instructors	Available upon review of University publications Surveys to be completed at the conclusion of the program	
How did the students find out about the program?	Description of Publicity Sources	Survey of Students Survey of Parents	Surveys to be completed at the conclusion of the program	
D. Program Outcome / Impact				
How many students complete the program? (Short-term)	Attendance/Completion Data	Attendance/Completion Records	Available upon request at the conclusion of the program	Program outcomes annually at the conclusion of the program and longitudinal data at 1, 4, 5, and 6 years after implementation
Does the program delivery meet the stakeholders' expectations and desired level of satisfaction? (Short-term)	Expectations of Math Dept. Expectations of English Dept. Expectations of Academic Affairs Expectations of Students Expectations of Parents Expectations of Coordinators	Survey of Math Dept. Instructors Survey of English Dept. Instructors Survey of Acad. Affairs Administrators Survey of Students Survey of Parents Survey of Program Coordinators	Surveys to be completed at the conclusion of the program	
Does the program delivery meet the participant/student needs? (Short-term)	Success rate of students entering 100-level gateway courses in math and/or English, respective to program completed. Success rate of students improving skills even if not advancing to next course level.	Placement Pre- and Post-Exam Data Placement Pre- and Post-Exam Data	Available upon request at the conclusion of the program Available upon request at the conclusion of the program	

Do the participants obtain passing grades in 100-level gateway courses? (Long-term)	Grades Received in 100-Level Gateway Course	Student Data Base	Longitudinal data available after student has had the opportunity to enroll in gateway course (one year)	
Do the participants persist to second year? (Long-term)	First to Second Year Retention	Tracking / Institutional Research	Longitudinal data available in September of year following program participation	
Do the participants persist to graduation? (Long-term)	Graduation	Tracking / Institutional Research	Longitudinal data available in 4, 5 and 6 year intervals after student matriculation	
Are the participants engaged in student organizations and campus activities?	Number of Memberships in Student Organizations and Number of Campus Events Attended	Survey of Students	Surveys to be completed at the conclusion of the program	
E. Program Cost / Efficiency				
Are resources used efficiently?	Cost Per Student	Analysis of Program Budget Per All Participants, Per Student who Achieves 100-Level Placement, Per Student who Improves Skills Based on Placement Data in Comparison with Retention Costs in Relation to Recruitment Cost (Note: It costs less to retain students than recruit new students.) Institutional Research.	Data available at the conclusion of the program and via additional longitudinal data	Financial reports annually at the conclusion of the program.
Could additional students be served in a cost effective manner?	Cost Per Student	Same as Above with Consideration of Additional Funding Availability (Academic Affairs).	Data available at the conclusion of the program and via additional longitudinal data	

<p>Are there alternatives with equivalent benefits and less cost?</p>	<p>Description of other alternatives for students needing developmental coursework.</p>	<p>Description of Current Courses, Placement Exams, Upcoming Pilot Programs, etc. In Consideration of Cost Per Student Data for all programs. Institutional Research and Academic Affairs.</p>	<p>Literature review of available programs in comparison with longitudinal data</p>	
---	---	--	---	--

Exhibit C: Survey Instrument

Math Summer Bridge 2012 Student Satisfaction Survey

Q1 Marshall University Math Summer Bridge 2012 Student Satisfaction Survey
This survey contains three sections.

Section A: Please respond to each of the following questions.

Q2 Your current age is:

- 18 - 23 (1)
- 24 - 35 (2)
- 36 - 45 (3)
- 46 - 55 (4)
- 55+ (5)

Q3 When did you first enroll in Marshall University?

- Fall 2011 (1)
- Fall 2012 (2)

Q4 What grade did you receive in MTH 121 or MTH 127 during the Fall 2012 regular academic semester?

- A (1)
- B (2)
- C (3)
- D (4)
- F (5)
- Incomplete (6)
- Withdrew from course (7)
- Did not enroll in MTH 121 or MTH 127 in Fall 2012 semester (8)
- Did not enroll in any courses in Fall 2012 semester (9)

Q5 What grade did you receive in MTH 098 or MTH 099 during the Fall 2012 regular academic semester?

- CR (credit/passed) (1)
- NC (no credit/failed) (2)
- Incomplete (3)
- Withdrew from course (4)
- Did not enroll in MTH 098 or MTH 099 during the Fall 2012 regular academic semester (5)
- Did not enroll in any courses in Fall 2012 semester (6)

Q6 Each day, the Summer Bridge Program schedule started at 9:00am. What that starting time:

- Too early (1)
- Too late (2)
- The right time (3)

Q7 Each day, the Summer Bridge Program ended around 1:30pm. Was the length of the day:

- Too short (1)
- Too long (2)
- The right length (3)

Q8 The Summer Bridge Program included eight days of instruction. Was the number of days of instruction:

- Too short (1)
- Too long (2)
- The right length (3)

Q9 How did you find out about the Summer Bridge Program?

- My parents told me (1)
- Postcard from Marshall University (2)
- Friend or other student (3)
- Marshall University website (4)
- Other (5) _____

Q10 Which campus did you attend?

- Huntington (1)
- South Charleston (2)
- MOVC Pt. Pleasant (3)

Q11 Section B: Please use the following scale to indicate your level of agreement with each statement.

	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)	Not Applicable (5)
Participation in the Summer Bridge Program improved my math skills. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The instructor was knowledgeable about the math skills he/she was teaching. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The instructor was helpful. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The teaching materials distributed in class were helpful. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Class time was well used. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tutoring outside of the classroom instruction was helpful. (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The online placement pre-test and post-test were easy to use. (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The online placement test reflected material taught in the program. (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The housing arrangements in the University residence halls met my needs. (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The cafeteria lunch provided each day was good. (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Parking was convenient. (11)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would recommend this program to other students. (12)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q12 Section C: Please provide your response to each of the following questions in the space provided.

Q13 What were the strengths of the Summer Bridge Program?

Q14 What were the weaknesses of the Summer Bridge Program?

Q15 What changes would you suggest to improve the Summer Bridge Program?

Q16 If you have any additional comments about the Summer Bridge Program, please include them here.

Q17 Thank you for submitting your responses. To end the survey, please click on the double arrow icon on the bottom right of this page.

Exhibit D: National Association for Development Education

Recommendations for Industry Standards for Evaluation of Developmental Education

Quantitative

1. How many students participated in the program/courses?
2. How many hours of tutoring were offered?
3. How many sections of developmental courses were offered?
4. What percentage of the students who entered the course stayed for the entire term?
5. What percentage of those who stayed the entire term earned a C or better?
6. What were the g-scores for those taking the course or receiving tutoring?
7. How many of those who participated in the course/program remained for one semester?
8. What percentage of those who passed the lowest level developmental course took and passed the next level developmental course?
9. What percentage of those who passed the highest level developmental course took and passed the next level curriculum course in that subject?
10. What percentage of those who took one or more developmental courses was retained from fall to fall?
11. What percentage of those who took one or more developmental courses graduated within 2, 3, 4, 5, 6 years?

Qualitative

1. To what extent are student users satisfied with the program?
2. What are faculty/staff perceptions of the program?
3. What are faculty/staff perceptions of the program's students?
4. What is the impact of program on the campus as a whole? (National Center for Developmental Education, n. d., p. 1-2).

Table 1

Participant Level of Agreement with Summer Bridge Elements

Program Element	Means	SD
1. Participation in the Summer Bridge Program improved my math skills.	3	0.94
2. The instructor was knowledgeable about the math skills he/she was teaching.	3.49	0.73
3. The instructor was helpful.	3.38	0.86
4. The teaching materials distributed in class were helpful.	3.19	1.00
5. Class time was well used.	3.27	0.90
6. Tutoring outside of the classroom instruction was helpful.	3.15	0.83
7. The online placement pre-test and post-test were easy to use.	3.03	0.97
8. The online placement test reflected material taught in the program.	2.75	1.08
9. The housing arrangements in the University residence halls met my needs.	3.05	0.94
10. The cafeteria lunch provided each day was good.	3.5	0.71
11. Parking was convenient.	3.53	0.67
12. I would recommend this program to other students.	3.54	0.89

n=37*Scale: 1=Strongly Disagree, 2=Disagree, 3=Agree, 4=Strongly Agree*

Table 2

Recommendations for University Administrators Evaluating Developmental Education Programs

Evaluation Topic	Recommendation
Program Design	<ul style="list-style-type: none"> • Establish feasible goals and objectives. • Articulate clear goals and objectives. • Establish a realistic change process. • Clearly identify the target audience. • Establish a clear method of delivering the service to the target audience. • Establish well-defined activities and program components. • Obtain adequate resources to implement the program. • Re-evaluate and clarify program goals and objectives. • Restructure the components of the program not meeting goals and objectives. • Work with stakeholders to reconsider the program logic and desired outcomes.
Evaluation Design	<ul style="list-style-type: none"> • Use a regression-discontinuity analysis or theory-based model

- Obtain adequate resources to evaluate the program.
- Follow the National Association for Developmental Education (NADE) Guidelines (Exhibit D).
- Establish benchmarking.
- Establish performance reporting.
- Commit to a model of continuous improvement.
- Consider external factors including the number of hours student works each semester, the student's responsibilities outside the classroom, and financial aid eligibility.
- Analyze success in gateway courses at the conclusion of the first semester of enrollment.

Survey Design

- Capture the audience while you have them in the program.
- Ensure survey questions are valid.

* Rossi, P. H., Lipsey, M. W., & Freeman, H. E. (2004). *Evaluation: A systematic approach* (7th Ed). Thousand Oaks, CA: Sage Publications, Inc.