

Examining the Evaluation of Developmental Education Programs

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Abstract

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Colleges and universities are being challenged to increase student persistence and retention by looking at student populations in need of developmental education. Underprepared high school students, non-traditional returning students, veterans, workers returning to enhance job skills, and immigrants are often surprised and dismayed to learn of their unpreparedness upon taking a placement examination. These populations have traditionally maintained lower persistence and graduation rates than traditional student populations and provide a broad target for increased support services that lend to persistence and graduation. By admitting these students, colleges and universities are obligated to provide effective and efficient support services to meet their developmental needs. To establish the effectiveness and efficiency of developmental programs, colleges and universities must employ continuous and rigorous evaluation strategies to justify the continuation or transformation of their developmental education programs. This paper reviews the current climate surrounding developmental education evaluation and the commonly employed developmental education evaluation methodologies.

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Introduction and Theoretical Framework

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. Currently, 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.

According to Vandal (2010), 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. 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 and math to prepare 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 delivery methods 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 classroom lecture-based 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 opportunities for individual and group tutoring.

The effectiveness of developmental programs, whether traditional or alternative, is hard to determine. There are innumerable extraneous factors 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, program evaluation is needed to assist in the direction of future developmental education programs. It is necessary to determine the methods of evaluation that identify relationships between developmental instruction and retention while accounting for the extraneous influences.

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 have made developmental education program evaluation a priority. By doing so, they allow 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. There is now an even more 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.

Purpose of the Study

The purpose of this paper will be to identify, compare, and contrast the various models utilized by colleges and universities to evaluate post-secondary developmental education programs. 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. According to Boylan and Bonham (2007), 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. Proper execution requires continual assessment and thorough evaluation.

Questions

In consideration of the current climate surrounding developmental education, there are several questions to be considered when reviewing evaluation models for developmental education.

1. What research methods are commonly used in determining the success of a developmental education program?
2. How are the evaluation models similar and how do they differ?
 - a. Do evaluation models include measures of persistence? If yes, at what intervals?
 - b. Do evaluation models include comparison of student success with both participants and nonparticipants who also need remediation?
 - c. Do evaluation models include comparison of student success with students who did not need remediation?
3. What specific result(s) has been measured to determine the success of a developmental education program? Is it defined by entry into a gateway course, by success in the actual gateway course, or some other factor?

Delimitations

This scope of this study is limited to two of the most common evaluation methods utilized in the evaluation of typical lecture-based developmental education and an experimental design. The two more common methods are the logistic regression analysis and the regression-discontinuity analysis. As neither of these studies represents a true experimental design, an evaluation of a summer bridge program with an experimental evaluation design is also reviewed.

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).

Methods

The method for this study is a literature review. Most of the literature reviewed was written since 2000. Two articles written in 1997 established a similarity in the developmental policy climate then and now and emphasize the need for evaluation. Most articles were obtained by searching the EBSCOHOST academic search engine via the Marshall University Library website. Other policy briefs and critical essays were obtained via a Google search for developmental education professional associations and private organizations involved in educational research and guidance.

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 in Literature

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 detrimental to the students' educational goals. It would also be unethical to withhold a service that is known to be needed. 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 dependent 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 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 but 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.

Scott-Clayton (2012), in her study on the analysis of the COMPASS placement exam, an exam utilized by many schools across the country for placement of students in developmental programs, notes that there have been some inconsistencies in studies that compare student outcomes for students just above and below the cut-scores. She believes the inconsistencies could be contributed to the nuances of the actual placement exams.

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 found support. 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 placements 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 fall on a continuum of positive impact, moderate impact, no impact and even negative impact on the developmental participants.

Collins emphasizes that all researchers, whether utilizing either 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 poor evaluation results. Both types of research methods struggle to find the causal relationship between the intervention and the results.

Evaluation of developmental education is gaining attention from state policy makers and college and university administrators. Effective evaluation methodologies need to be implemented to ensure that programs are not only successful in retaining students but cost effective. 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 found increased persistence shortly after completion of the program, but the results diminished over time. Many questions remain on the effectiveness of the evaluation methodologies.

Conclusions

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. The literature review supports the following conclusions.

Research Question One: What research methods are commonly used in determining the success of a developmental education program?

There is little truly experimental research performed on developmental educational programs. Assigning students to developmental support programs and choosing similar students to not participate creates an ethical dilemma for colleges and universities. It is not ethical to withhold needed services that could affect student success and persistence. This is costly both to the student and the institution. This method, however, has been utilized for optional programs such as summer bridge programs.

The most common methods are logistic regression analysis and a regression-discontinuity analysis. The logistic regression measures a dependent variable against one or more independent variables to determine a causal relationship with the intervention and the results. The regression-discontinuity analysis is a quasi-experimental study incorporating a standardized cut-score with placement of participants just above the cut-score in the control group and those just below the cut-score in the study group. Because the groups are so close, the researcher assumes that all other variables are random, thus allowing the differences in student performance to be the measured result of the treatment intervention.

Research Question Two: How are the evaluation models similar and how do they differ? Do evaluation models include measures of persistence? If yes, at what intervals? Do evaluation models include comparison of student success with both participants and nonparticipants who also need remediation? Do evaluation models include comparison of student success with students who did not need remediation?

The regression analysis puts more emphasis on outside factors beyond the intervention while the regression-discontinuity model places emphasis solely on the treatment making the assumption that the populations are randomly similar. Both methods evaluate the performance of students needing developmental assistance and students who do not need the intervention. With the exception of the rare experimental designs for optional developmental programs, success is not typically measured between two groups who need developmental treatments as it is unethical to withhold such treatment.

Research Question Three: What specific result(s) has been measured to determine the success of a developmental education program? Is it defined by entry into a gateway course, by success in the actual gateway course, or some other factor?

The measures commonly evaluated for student performance include successful completion of the developmental courses and success in the college-level gateway courses. Additionally, the number of college course hours completed in a designated period of time and student persistence is typically measured after the first year and some longitudinal studies incorporate graduation rates.

Discussion and Implications

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.

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 standardized goals should be used for evaluating current developmental education programs and could be used to establish

the framework for new programs and their evaluations models. 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 Appendix (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.

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Appendix

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).