



**A Model for Accelerating Academic Success
of Community College Remedial English Students:
Is the Accelerated Learning Program (ALP) Effective and Affordable?**

Davis Jenkins
Cecilia Speroni
Clive Belfield
Shanna Smith Jaggars
Nikki Edgecombe

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Address correspondence to:

Davis Jenkins
Senior Research Associate, Community College Research Center
Teachers College, Columbia University
525 West 120th Street, Box 174
New York, NY 10027
212-678-3091
Email: davisjenkins@gmail.com

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Abstract

This paper presents the findings from a quantitative analysis of the Community College of Baltimore County's Accelerated Learning Program (ALP). Under ALP, students placed into upper-level developmental writing are "mainstreamed" into English 101 classes and simultaneously enrolled in a companion ALP course (taught by the same instructor) that meets in the class period immediately following the English 101 class. The aim of the ALP course, which has only eight students, is to help students maximize the likelihood of their success in English 101. Our results suggest that among students who place into the highest level developmental writing course, participating in ALP is associated with substantially better outcomes in terms of English 101 completion and English 102 completion, the two primary outcomes ALP was designed to improve. However, we found no evidence that ALP students' greater likelihood of completing English 101 and 102 correlates with increased rates of college persistence or passing other college-level courses. Looking at the costs of ALP in relation to our findings on its effects, we found that ALP is a more cost-effective pathway through the required college-level English courses than the traditional developmental English sequence as measured by cost per successful student (\$2,680 versus \$3,122). A rough cost-benefit analysis finds that the benefits of ALP are more than double the costs.

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1. Introduction

More than half of recent high school graduates who enter postsecondary education through community colleges enroll in at least one remedial or “developmental” course in math, reading, or writing (Attewell, Lavin, Domina, & Levey, 2006). A handful of recent studies have used rigorous statistical methods to compare the success of students who enroll in developmental courses with that of similar students who enroll directly in college-level courses. These studies generally show little positive effects for developmental education, although their results are most reliable for students at the upper end of the developmental range—that is, for students who are assigned to remediation but who score near the developmental “cut-off” point on placement tests (Bettinger & Long, 2005; Calcagno & Long, 2008; Martorell & McFarlin, 2007). A growing number of community colleges are experimenting with strategies for accelerating the progress of students needing remediation, particularly those who are near the “college-ready” level of preparation (Bailey, 2009). In some cases, colleges combine developmental courses at different levels, thus reducing the number of courses students have to take. In other cases, students needing remediation are “mainstreamed” directly into college-level coursework that incorporates supplemental instruction, tutoring, or other supports.

A study conducted by the Community College of Baltimore County (CCBC) indicated that too many of its students fail the upper-level developmental English course and that of those who pass, too few go on to take and pass English 101 (ENGL 101). In response, a group of English faculty and administrators at CCBC developed a mainstreaming model called the Accelerated Learning Program (ALP).¹ Under ALP, students placed into the college’s upper-level developmental writing course (ENGL 052) are permitted to register for specially designated sections of ENGL 101. These sections have eight seats reserved for ALP students, with the other 12 seats open to students who place directly into ENGL 101. The eight ALP students also register for a section of an ALP companion course, which meets in the class period immediately following the ENGL 101 section in another room. The same instructor teaches both ENGL 101 and the

¹ A detailed discussion of ALP’s development is provided by Adams, Gearheart, Miller, and Roberts (2009). Information is also available on the program’s website, <http://faculty.ccbcmd.edu/~padams/ALP/indexa.html>.

ALP companion course. The purpose of the ALP course is to answer students' questions, practice writing short papers, work on grammar and punctuation, or engage in any other activities needed to maximize ALP students' likelihood of success in the ENGL 101 course. If students pass both courses, they take the next course in the writing sequence, ENGL 102. If they pass the companion course but not ENGL 101, they must take 101 again. If they fail both courses, they must either take the 101/ALP combination again or take the traditional ENGL 052 developmental writing course. The ALP approach is potentially important for accelerating the progress of CCBC students referred to developmental instruction in English because in the past, following state policy, the college barred students from enrolling in ENGL 101 until they completed the developmental sequence. While students do not receive degree credit for the ALP course, passing it does fulfill their developmental writing requirement under the college's mandatory placement policy.

ALP students pay tuition for six credits for the two courses. ENGL 101 counts as a three-credit course, but students do not receive credit toward a degree for the companion course (in the state of Maryland, as elsewhere, college credit cannot be awarded for developmental courses). Faculty receive three on-load assignment credits for ENGL 101 but only two credits for the three-hour-per-week companion course. According to the program's developers, faculty find this arrangement fair because ALP classes are small and do not require completely separate preparation from ENGL 101.

ALP's primary innovation is structural rather than instructional. While 100% of the students who place into ENGL 052 and enroll in ALP will automatically attempt English 101, only about half of those who go through the conventional sequence and enroll in the regular ENGL 052 will go on to take ENGL 101 within a year.² ALP's developers have not modified the curriculum of ENGL 101 to accommodate ALP students. On the contrary, they purposefully work to maintain the academic rigor of ENGL 101. To the extent that there is instructional innovation in ALP, it occurs during the ALP companion course, where faculty have the latitude to provide any instruction they think appropriate to help ALP students succeed in ENGL 101.

² This estimate is based on the sample of ALP and non-ALP students at CCBC used in the analysis reported here.

ALP was launched in 2007–08 with 10 sections and 80 students. A preliminary analysis by the college of the initial ALP cohorts found that approximately 60% of ALP students passed English 101, compared with about a quarter of students who began with the highest level developmental English course. Because the successful ALP students completed English 101 in one semester instead of the two required by the conventional model, the ALP approach produced more than double the success rate in half the time. A study conducted by the college to determine the extent to which instructor bias may play a role in these outcomes found that a slightly higher percentage of ALP students were judged through a blind review to have written failing essays than students placed directly into English 101. The measured size of this bias is too small, however, to explain the much higher rates of success observed for ALP students in the early semesters of the program. Given that the ALP program is voluntary, it is also possible that student selection bias could be responsible for the higher success rates of ALP students. To examine this possibility, the college also compared ALP students to upper-level developmental English students and found the ALP students to be similar to the developmental students in most respects.

In examining the costs of the ALP approach, the college found that ALP costs almost twice as much per year as the traditional model, in which developmental courses are taught separately from the college-level courses. However, the cost per *successful* student (i.e., for each student passing ENGL 101) is slightly less with ALP than under the traditional model.

Spurred by the positive results from its internal evaluation of ALP, CCBC is expanding the program. In the 2010 academic year, the college will offer 80 ALP sections serving 640 students, or about one quarter of all students who typically enroll in the highest level developmental English class. Other community colleges encouraged by ALP's early success are now testing similar models. Even so, faculty and administrators at CCBC continue to evaluate the program. In 2009, CCBC asked the Community College Research Center (CCRC) at Teachers College, Columbia University, to conduct an in-depth quantitative analysis to assess whether ALP is effective and, if so, whether it is worth the added cost. This report presents the findings from CCRC's initial study.

The report is organized as follows. Section 2 presents the results of our quantitative analysis of the effects of participating in ALP on various outcomes. Section 3 provides a basic analysis of the costs and benefits of ALP. Details on how we calculated program costs are given in Appendix B. The conclusion (Section 4) summarizes our findings and describes plans for further research on the ALP model.

2. Multivariate Analysis of Program Effectiveness

Community College of Baltimore County's initial analyses of the outcomes of ALP were based on descriptive statistics. In the present study, CCRC used multivariate statistics to examine the effects of participating in ALP on a series of student outcomes, controlling for student demographics and educational backgrounds as well as instructor effects.

2.1 Sample

To conduct the analysis reported here, we used student unit record data provided by CCBC to compare students who enrolled in ENGL 101 and the companion ALP ENGL 052 course with students who enrolled in the traditional ENGL 052 course. We examined students who took ENGL 052 (either the traditional or the ALP versions) for the first time in fall 2007, spring 2008, or fall 2008, the first three semesters ALP was offered. We followed these students through fall 2009, at least one year after their ENGL 052 semester. Across the first three semesters of ALP, a total of 137 students (whom we refer to as "ALP" or "treatment" students) enrolled in ALP ENGL 052 and ENGL 101 concurrently, and 2,323 students (whom we call "non-ALP" or "control" students) enrolled in a traditional section of ENGL 052. We excluded students who had previously attempted ENGL 052 (approximately 20% of ALP students), as well as students who took developmental writing as a "parallel enrollment" course (that is, while they were still in high school).³ These exclusions resulted in a sample of 104 ALP students and 2,070 control students for analysis.

³ About 5.2% of all students have missing high school graduation dates. We assumed that these students were not parallel enrollment students when they first enrolled in college.

The demographic characteristics of each group (shown in Table A.1—tables can be found in Appendix A) suggest that ALP students were somewhat younger and more likely to be White than the non-ALP control group. ALP students were also more likely to have enrolled in a CCBC course through “parallel enrollment”—that is, while they were still in high school—and to have taken more courses in previous semesters. ALP students scored higher on the college placement reading test than did non-ALP students, although there was no statistically significant difference in their writing placement scores. These differences suggest that, on average, ALP students may have been somewhat better prepared academically than students in the non-ALP control group. In terms of other enrollment and demographic characteristics, including socioeconomic background, the ALP and non-ALP groups were similar. Approximately 12% of non-ALP students participated in a learning community that paired ENGL 052 with a college-level course other than ENGL 101. In our analysis below, we will see if these students affect the comparison between non-ALP and ALP students.

2.2 Outcomes Examined and Analysis Methods

In comparing ALP students with the non-ALP control group and estimating the effects of participating in ALP, we examined the following outcomes:

English 052 outcomes

- *ENGL 052 pass* – whether the student passed ENGL 052.

English 101 outcomes

- *ENGL 101 attempt* – whether the student attempted ENGL 101.⁴
- *ENGL 101 pass (unconditional)* – whether the student passed ENGL 101 with a grade of “C” or higher (with students who did not attempt the course assigned the outcome “not passed”), termed the “unconditional pass rate.”
- *ENGL 101 grade (unconditional)* – grade earned in ENGL 101 (ranging from 0 to 4, with students who did not attempt the course assigned the grade “0”), termed the “unconditional grade.”

⁴ This is by definition part of the ALP treatment and therefore is not strictly an outcome measure. We include it only to provide data on how ENGL 101 enrollment rates differed between the two groups.

- *ENGL 101 pass (conditional)* – among those who attempted ENGL 101, whether the student passed, termed the “conditional pass rate.”
- *ENGL 101 grade (conditional)* – among those who attempted ENGL 101, the grade earned (ranging from 0 to 4), termed the “conditional grade.”

English 102 outcomes

- *ENGL 102 attempt* – whether the student attempted ENGL 102.
- *ENGL 102 pass (unconditional)* – whether the student passed ENGL 102 with a grade of “C” or higher (with students who did not attempt the course assigned the outcome “not passed”).
- *ENGL 102 grade (unconditional)* – grade earned in ENGL 102 (ranging from 0 to 4, with students who did not attempt the course assigned the grade “0”).
- *ENGL pass (conditional)* – among those who attempted ENGL 102, whether the student passed.
- *ENGL 102 grade (conditional)* – among those who attempted ENGL 102, the grade earned (ranging from 0 to 4).

Other persistence and success outcomes

- *Persist to next term* – persisted to the term subsequent to ENGL 052.
- *Persist to next year* – persisted for one year (2 long semesters) subsequent to ENG052.
- *College courses attempted* – number of college-level courses attempted after taking ENGL 052.
- *Success rate in college-level courses* – among college-level courses attempted after taking ENGL 052, proportion passed with a C or better.
- *College-level credits accrued* – total college-level credits passed after taking ENGL 052.

Table A.2 descriptively compares ALP and non-ALP students according to these outcomes, using two time frames to calculate the outcomes: (1) all cohorts tracked through fall 2009, and (2) each cohort tracked for 1 year subsequent to completion of

ENGL 052 or ALP. The results for these two sets of comparisons are similar. On most outcome measures, ALP students did better than non-ALP students. The three exceptions are course grades, persistence, and success rates in college courses, where ALP students did no better or worse than non-ALP students. However, the comparisons in Table A.2 do not account for differences in the characteristics of ALP and non-ALP students—nor do they account for the fact that ALP could be attracting faculty who are more motivated or skilled to help students succeed. To control for these differences, we ran seven regression models, as described in the next section.

2.3 Results

Table A.3 shows the results of the seven regression models with each outcome measured over three semesters (the ENGL 052 semester and two subsequent long semesters). Below we describe each model and its results.

Model 1 estimates the raw or unadjusted effect of ALP, with no covariates included. This model suggests that students participating in ALP are more likely to pass ENGL 101, but only because they are more likely to enroll in ENGL 101 in the first place. ALP students who enrolled in ENGL 101 had grades similar to those of ENGL 101 students who progressed from a traditional section of ENGL 052. Perhaps because they were more likely to complete ENGL 101, ALP students were also more likely to both attempt and pass ENGL 102. Again, however, ALP students who enrolled in ENGL 102 earned similar grades to students who followed the traditional sequence and persisted as far as ENGL 102. ALP and control students were equally likely to remain enrolled in the next semester and the next year, but ALP students attempted more college-level courses than did non-ALP students.

Model 2 expands Model 1 by controlling for a large number of student-level covariates. In addition to the student characteristics listed in Table A.1, the model included controls for whether the student took an English as a Second Language (ESL) test, whether the student was classified as a transfer student at first enrollment, the student's self-declared educational objective at first enrollment (transfer, career, personal enrichment, or undeclared), and the college campus on which the English course in

question was taken.⁵ Approximately 6% of the sample was missing census data and 37% did not file for financial aid; these students were included in the model with dummy variables indicating where the relevant data elements (including family income, family size, lives with relative, and dependency status) were missing. Given that the descriptive statistics in Table A.1 showed a fairly similar profile for ALP and non-ALP students, we did not expect student covariates to have a strong impact on the estimated effect of ALP program participation, and indeed, the coefficients and patterns of significance remained consistent with Model 1.

Model 3 expands Model 2 by adding the only known ENGL 052 (ALP or regular) teacher characteristic: part-time versus full-time faculty. This was done to see if sections taught by full-time faculty might have better outcomes (or vice versa). Even with this added control, the model results remained consistent.

Model 4 expands Model 3 by controlling for the student's cohort, defined by the year students took ENGL 052 for the first time at any CCBC campus. Again, model results remained consistent.

The remaining three models build upon Model 4, and serve as robustness checks.

Model 5 excludes non-ALP students who took ENGL 052 as part of a learning community (approximately 12% of the non-ALP sample), given that these students received what was considered an enhanced ENGL 052 experience. Results remained consistent with Model 4.

A large proportion of students do not take developmental writing during their first term in college. While the regression models control for the number of courses taken before ENGL 052, it is possible that students' previous course taking patterns and experiences reflect differences between students that we cannot control for. To explore this issue further, Model 6 estimates Model 4 based on the subsample of students who were first-semester college students when they took ENGL 052. This exclusion reduces the sample size by about 30%. Results remain similar, except that the positive estimated effect of ALP on college-level courses attempted is reduced and becomes non-significant.

⁵ To adjust for similarities between students who matriculated to CCBC from the same high school, each model included standard errors clustered at the high school level.

To control for potential unobserved teacher motivation or quality, an optimal strategy would compare the outcomes of ALP and non-ALP students who took ENGL 101 with the same instructor. Model 7 partially accomplishes this by adding controls for “teacher fixed effects” (i.e., dummy variables for each instructor). The model’s correction for teacher effects relies primarily on the 12 teachers who taught both ALP and non-ALP students (but not in the same sections) during the time frame of the study (who totaled 104 ALP students and 145 non-ALP students). In effect, this model allows us to compare the outcomes of ALP and non-ALP students who took ENGL 101 with the same instructor. Because it compares ALP students in ENGL 101 with students who had taken ENGL 052 before enrolling in ENGL 101, this model provides a more rigorous test of ALP than previous ones, since we might expect the latter students, who had to pass a course to get into ENGL 101, to be highly motivated and thus perhaps do better than the ALP students, who were allowed to enroll in college English directly. With the addition of the teacher effects, we still see a positive and statistically significant effect of ALP on unconditional ENGL 101 pass rates, although the size of the effect is smaller than in the other models.

For the first time in our series of models, the estimated effects of ALP on conditional ENGL 101 pass rates and grades are also positive and significant. For ENGL 102 outcomes, we again observe positive effects for ALP, suggesting that ALP students’ success in ENGL 101 cannot be solely attributed to teachers’ being more accommodating with ALP students than with non-ALP students. However, the longer-term outcomes for Model 7 differ substantially from the results of the previous models: this model suggests *negative* effects of ALP on retention and college-level courses attempted. In an analysis not reported here, we compared the fixed-effects coefficients for the ALP ENGL 101 teachers and the ENGL 101 teachers who did not teach ALP to see if we could find evidence that the former were “better” instructors than the latter (as measured by the probability that their students attempted ENGL 102). The results were inconclusive. This is likely because the results rely on a small number of instructors and the model may be somewhat “over-parameterized,” given the number of explanatory variables in relation to the sample size.

2.4 Discussion of Results

The results of the seven models suggest that participating in ALP is clearly associated with higher rates of taking and passing ENGL 101 and ENGL 102 and, in most of the models, a higher number of total college-level credits attempted in the year following ENGL 052.

Table A.4 shows the magnitude of the effects by comparing the one-year outcomes of ALP and non-ALP students in terms of their actual outcome rates as well as the estimated rates based on Model 2 (with controls for student demographic characteristics but without controls for teacher effects) and Model 7 (which has controls both for student characteristics and teacher effects). Estimated rates were calculated using the estimated effect for each explanatory variable from the respective model and the mean values of these variables for the sample. The table also indicates whether there is a statistically significant difference between ALP and non-ALP students for the outcome and model in question.

Thus, for example, on average 74% of ALP students passed ENGL 101 within a year of taking ENGL 101/ALP, while 38% of non-ALP students passed ENGL 101 within a year of taking traditional ENGL 052. The estimated rates of passing ENGL 101, controlling for student characteristics (Model 2), are 71% for ALP and 38% for non-ALP students. When we add controls for teacher effects (Model 7), the estimated ENGL 101 pass rate drops to 57% for ALP but remains fairly consistent at 39% for non-ALP students. Differences between ALP and non-ALP students on this outcome remain statistically significant under all three models. Similar positive and statistically significant differences between ALP and non-ALP students are evident in the actual and estimated rates of completing ENGL 102. In some ways, passing ENGL 102 is a stronger measure of the effectiveness of ALP than passing ENGL 101, since students take the 102 course without the support of the ALP companion course and instructor.

ALP was explicitly designed to improve the rate at which students take and pass ENGL 101 and 102. Based on this quantitative analysis, the program does very well on both outcomes. This was the case even when we added controls for the effect of instructors who taught both ALP and non-ALP sections of ENGL 101, the latter of which included students who had previously taken and passed ENGL 052 and thus might be

expected to do better than the ALP students who were admitted directly into college-level English. These results are especially impressive given that that are based on an analysis of the program in the first three semesters that it was offered.

It is reasonable to expect that if ALP students are more likely to pass these key “gatekeeper” courses, they will have more confidence in their ability to take and pass other college-level courses and to persist in their studies. And indeed, ALP students were more likely than the non-ALP comparison group to attempt college-level courses. This effect remained when we controlled for student characteristics. However, when we added controls for instructor effects, we found that ALP students were *less* likely to be retained and to attempt college-level courses. As noted, the teacher controls allow us in effect to compare ALP students in ENGL 101 with students who had gotten to ENGL 101 by previously passing ENGL 052 (and perhaps other developmental courses). One might expect these students, who have been motivated enough to pass developmental courses to get to the college level, to be more persistent in attempting college-level courses than ALP students who were allowed to enroll directly into the college-level English course (while taking the developmental companion course simultaneously)—and in fact that is what we found.

We saw little indication that instructors who taught both ALP and regular ENGL 101 students were somehow more accommodating to ALP students by grading them more easily than other students. However, we did not find evidence that the increased rates of success of ALP students in ENGL 101 and 102 translate into an increased likelihood to take and pass other college-level courses.

In estimating the effects of participating in ALP on near-term education outcomes, we controlled for a wide array of student characteristics, including age, race, family income and educational background, and enrollment status (in addition to the teacher effects controlled for in Model 7). However, there may be other unmeasured characteristics of ALP students, such as motivation, that make them more likely than non-ALP comparison students to succeed. While the results of this analysis show that participation in the ALP program is correlated with better outcomes on key measures of success—particularly completing ENGL 101 and 102—it is important to note that the

results do not provide definitive evidence that the ALP program caused the superior outcomes.

3. Cost Analysis of ALP Outcomes

There are two main methods of economic evaluation: cost–benefit analysis (CBA) and cost-effectiveness analysis (CEA). Each method serves different purposes. CBA provides information on whether an intervention is worth implementing on efficiency grounds, i.e., does the intervention make the best use of available resources? CEA provides information on which intervention uses resources most efficiently to achieve a given objective, e.g., which method improves students’ English skills at the lowest cost?

In this section, we analyze the cost-effectiveness of ALP relative to the traditional ENGL 052 model. Cost-effectiveness is more appropriate for this analysis because the objective is already established: at issue is whether ALP achieves that objective at lower cost than the traditional model. However, it might also be of interest to know whether ALP represents a good use of available resources, so we also present a basic estimate of the program’s benefits, net of its costs.

3.1 Cost-Effectiveness

A primary objective of ALP is to enable students at CCBC who placed into ENGL 052 to pass ENGL 101 and to take and pass ENGL 102. The question is whether the ALP model or the traditional ENGL 052 model meets this objective at the least cost. The details of our cost-effectiveness analysis are given in the three panels of Table A.5.

Calculation of the cost-effectiveness of ALP is based on a simple pathway framework for a given cohort size. The pathway begins with 250 students entering CCBC and, based on their scores on the ACCUPLACER test, being placed into ENGL 052, the highest level of developmental English.⁶ Under the traditional model, these 250 students would enroll in ENGL 052; those who passed ENGL 052 would then enroll in ENGL 101; and those who passed that course would then enroll in ENGL 102. Under ALP, the

⁶ Students could also be placed into the lower-level developmental English course and progress to ENGL 052 by passing the lower-level course.

250 students would enroll in a revised form of ENGL 052 and in ENGL 101 within the same semester; students who passed both courses would then enroll in ENGL 102.

Therefore, the key parameters of the cost-effectiveness analysis are (a) the cost of providing the ALP version of ENGL 052 and (b) the resource implications from different pass rates across the three ENGL courses. The first of these parameters was calculated using a questionnaire devised for ALP, with responses collected from CCBC personnel. The full details of the costs analysis are given in Appendix B.⁷ The differential pass rates are taken from Tables A.2 and A.3. The differential pass rates vary according to the specification of the outcomes model. In column 1 of Table A.5 we use the baseline differentials, unadjusted for covariates (from Table A.2). In column 2 we use the adjusted baseline differentials (from Table A.3). For explanation, we refer here to the calculations in column 1.

For 250 students, the cost of ALP-ENGL 052 is \$135,917. In comparison, the traditional model costs \$73,325. These totals translate into per-student costs of \$544 versus \$293. The difference in costs is primarily attributable to the smaller section size for ALP-ENGL 052 (at 8 students, compared with a traditional class size of 20). However, the pass rate for ALP students is substantially higher (82% versus 69%). Therefore, the cost per passing student is \$665 for ALP versus \$423 for the traditional model (top panel of Table A.5).

ALP students are also taking ENGL 101 in the same semester as ENGL 052, so this resource effect must be taken into account. This is shown in the middle panel of Table A.5. The ENGL 101 course is delivered using the same resources as a traditional ENGL course; the cost for 250 students is therefore \$73,325.⁸ To this must be added the cost of ALP-ENGL 052 at \$135,917. The ALP pass rate for ENGL 052-ENGL 101 is 75%, which yields 188 students. Therefore, the cost per passing student for ENGL 052-

⁷ We greatly appreciate the contributions of staff at CCBC in providing this information, especially Professor Adams, Dr. McColloch, Dr. McConochie, and Dr. McKusick. All interpretations of information are the responsibility of the authors.

⁸ This assumes that all ENGL 101 and ENGL 102 classes are delivered in the same way, i.e., the section sizes are the same and the rank of faculty instructors is the same, and that this delivery corresponds to how the traditional version of ENGL052 is delivered. Although these assumptions may not be valid in any given case, they are likely to be valid in the general case. Also, validity is mainly threatened to the extent that the costs of these courses differ across ALP and traditional students (not that the costs are misestimated). Such differences are unlikely to be large. We find no difference in costs between the two versions of ENGL 101, and students are free to choose any section of ENGL 102.

ENGL 101 is \$1,116. In comparison, only 54% of students from the traditional ENGL 052 progress to ENGL 101. The incremental cost for delivering ENGL 101 to these students is \$39,815, and to get the cost of this pathway, it is necessary to add the cost of ENGL 052 at \$73,325. However, only 40% of students in the traditional pathway pass ENGL 101. Therefore, the cost per passing student for ENGL 052-ENGL 101 is \$1,131.

Thus, when we compare ALP and the traditional model, they are equally cost-effective in terms of providing a pathway for students to take and pass ENGL 101 (\$1,116 versus \$1,131). This conclusion is also affirmed using the adjusted model of column 2 in Table A.5. Accounting for differences in the types of students who enroll in ALP versus the traditional model, the cost per passing student is marginally in favor of the traditional model (\$1,139 versus \$1,078).

However, ALP is also intended to raise completion rates in ENGL 102. The resource implications of this are shown in the bottom panel of Table A.5. ALP students enroll in ENGL 102 at a rate of 48%. The cost of ENGL 102 provision to these students is therefore \$35,269. To this must be added the costs of the pathway through ENGL 052 and ENGL 101. These ALP students pass ENGL 102 at a rate of 37%, which yields 91 students out of the initial 250. Therefore, the cost per student who passes all three ENGL courses (052, 101, and 102) is \$2,680. In comparison, for the students who follow the traditional model starting with ENGL 052, 22% will take ENGL 102 and 17% will pass it (a final yield of 42 students). Accounting for the full resources of this traditional pathway, the cost per student who passes all three ENGL courses is \$3,122.

Thus, when compared to the traditional model in which students take developmental English and ENGL 101 sequentially, ALP provides a substantially more cost-effective route for students to pass the ENGL 101 and 102 sequence required for an associate degree (\$2,680 versus \$3,122). This difference of \$442 per student represents 14% less spending by the college on a cohort of ENGL 052 students. Alternatively expressed, if the college enrolls 250 ENGL 052 students each year with the objective of getting them to pass ENGL 102, it will save \$40,400 using the ALP method rather than the traditional model. This cost-effectiveness conclusion is also affirmed using the adjusted model. However, the difference in costs is slightly smaller when we account for

student characteristics; as shown in column (2), ALP costs \$2,757, versus \$2,938 for the traditional model, to ensure a student passes all three ENGL courses.

3.2 Cost–Benefit Analysis

It is also possible to undertake a cost–benefit analysis (CBA) of ALP. CBA may help justify the decision to offer provision for English courses using the ALP model (rather than not offering such provision). As this is not a policy option, we only present a basic outline of the cost–benefit calculation.

Based on the outcomes analysis reported in Section 2, ALP students pass 1.79 more courses than students who receive the traditional model.⁹ Each course costs \$293 per student, so ALP is worth \$524 per student. If we equate the cost of the program to societal willingness to pay, then this amount is the net benefit of ALP relative to the traditional model. The additional cost of ALP is \$250 per student.¹⁰

Therefore, ALP has a benefit–cost ratio of 2.1:1, that is, the benefits are more than double the costs. A simple decision criterion for CBA is: do the benefits exceed the costs? For ALP, where the goal is to improve student progression through the English courses at CCBC that are required for completion of an associate degree, the answer is yes.

Finally, we note that an alternative CBA would look at the benefits to the individual student in terms of gains in earnings from accumulating more college credits. Given the high returns to completing college credits, it is likely that this too will yield a benefit–cost ratio that exceeds 1.

4. Conclusion

This multivariate analysis suggests that, among students who are referred to the highest level of developmental English at the Community College of Baltimore County, those who enroll directly in ENGL 101 and the concurrent ALP companion course, are significantly more likely than those who first enroll in the highest level developmental

⁹ This is the unadjusted difference from Table A.1. However, it is probably an underestimate because the students are only followed for a short period after completing ALP and may accumulate more credits in the future.

¹⁰ The benefits do not need to be discounted; the courses are all being taken within a two-year period.

English course (ENGL 052) to take and pass English 101 and 102. For example, in the sample used in this study, 82% of ALP students passed ENGL 101 within one year, compared with 69% of non-ALP ENGL 052 students. More than a third (34%) of ALP students passed ENGL 102, compared with only 12% of the non-ALP ENGL 052 students. A similar pattern is observed even after we use regression to control for an array of student characteristics and teacher effects. These results are especially impressive, given that they are based on an analysis of the outcomes of the program in the first three semesters it was offered.

ALP students were more likely than students in the comparison group to attempt other college-level courses in the year after they took ALP/ENGL 052, although they were no more likely to complete courses and persist to the next term. These results were mirrored in all of our multivariate models except the one where we controlled for instructor effects. In that model, we found that ALP students were *less* likely either to attempt college-level courses or persist to the next term. This is perhaps not surprising, given that that model compared ALP students with students who had gotten to ENGL 101 after passing one or more developmental courses and thus may have been more motivated to persist. This suggests that the increased rates at which ALP students take and pass ENGL 101 and 102 did not correlate with increased success in other college-level courses.

Looking at the costs of ALP in relation to our findings on its effects, we found that ALP is a substantially more cost-effective pathway through the required college-level English courses than the traditional developmental English sequence, as measured by cost per successful student (\$2,680 versus \$3,122). A rough cost–benefit analysis finds that the benefits of ALP are more than double the costs.

It is important to note that, with the methods used here, we can only make inferences about the *correlation* between participating in ALP and the outcomes observed. Because of possible selection bias, we cannot say, based on these results, that ALP *caused* these outcomes. Because of the promising preliminary findings on the program, CCBC is in the process of scaling up ALP such that by next year, the majority of students who are referred to the highest level developmental English will be enrolled in ENGL 101 with the concurrent ALP support course. CCBC administrators have

indicated that because they plan to focus their energies on scaling up the program, they are not prepared to staff an effort to conduct an experimental test of it. In lieu of an experiment, CCRC will continue to examine ways to account for possible selection bias, including the possibility of examining what happens to students who want to enroll in ALP but are not able to because of capacity constraints. In future analyses, we will examine in more depth the effects of instructor quality on program outcomes and will also explore whether the regular ENGL 101 students in ALP ENGL 101 classes (i.e., those who place into college-level English and are not enrolled in the ALP support course) are affected positively or negatively. In addition, CCRC's future analyses will examine the program's effects and costs with longer-term outcomes, including credential completion and baccalaureate transfer.

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Appendix A: Tables

Table A.1
Student Characteristics: ALP and Control Groups Compared

Variable	ALP ENGL 052 (1)	Non-ALP ENGL 052 (2)	Difference (1)-(2) (3)
<i>Student Demographics</i>			
Female	55.8%	53.3%	2.4%
Age at first enrollment	18.98	20.51	-1.53**
White	47.1%	38.4%	8.8%*
Hispanic	1.9%	3.2%	-1.3%
Black	43.3%	49.6%	-6.3%
Asian	3.8%	3.9%	-0.1%
<i>Socioeconomic Background</i>			
Median income in student's census tract ^a	\$42,856	\$44,683	-\$1,826
Family income	\$15,350	\$16,336	-\$986
Expected Family Contribution (FASFA "EFC")	\$1,290	\$1,433	-\$144
Financial aid recipient (grant, scholarship, loans, or work study)	51.0%	54.3%	-3.3%
Pell Grant recipient	42.3%	44.1%	-1.8%
Grant amount	\$1,553	\$1,641	-\$88
Loan amount	\$447	\$573	-\$127
Total financial aid amount	\$2,090	\$2,330	-\$240
Family size	2.94	3.04	-0.10
Lives with parents or relatives	25.0%	21.7%	3.3%
<i>Enrollment Characteristics</i>			
Full-time at first enrollment	56.7%	56.6%	0.2%
Earned credits prior to first enrollment at CCBC	9.6%	8.8%	0.8%
Baltimore County resident	74.0%	72.1%	2.0%
Previous CCBC parallel high school enrollment student	11.5%	4.1%	7.4%***
Took ENGL051 (lower-level developmental)	8.7%	6.6%	2.1%
Number of courses (college-level or dev-ed) before ENGL 052	1.50	0.99	0.51***
Participated in ENGL 052 learning community	0.0%	11.8%	-11.8%***
<i>Academic Preparation</i>			
CPT Writing (English) score	74.46	72.72	1.74
CPT Reading score	72.50	67.25	5.25***
CPT Math score	48.53	44.63	3.90*
Number of Students	104	2,070	

^a Each student's home address was geocoded and matched with information on average family income and educational attainment in the census tract in which the student resides. See Crosta, Leinbach, and Jenkins (2006) for details on the methodology used to do this matching.

* $p < .10$. ** $p < .05$. *** $p < .01$.

Table A.2
Student Outcomes: ALP and Control Groups Compared

Outcomes	ALP ENGL 052 (1)	Non-ALP ENGL 052 (2)	Difference (1)-(2) (3)
<i>Followed to Winter 2010</i>			
ENGL 052 pass	81.7%	69.4%	12.3%***
ENGL 101 attempt	100.0%	54.3%	45.7%***
ENGL 101 pass (grade "C" or better) – for all in cohort	75.0%	40.0%	35.0%***
ENGL 101 grade – conditioned on attempted	1.98	2.08	-0.10
ENGL 102 attempt	48.1%	22.4%	25.7%***
ENGL 102 pass (grade "C" or better) – for all in cohort	36.5%	16.6%	20.0%***
ENGL 102 grade – conditioned on attempted	2.20	2.18	0.02
Persist to next term (after ENGL 052)	76.0%	73.3%	2.7%
Persist to next year (after ENGL 052)	63.5%	55.7%	7.7%
Number of academic courses attempted (after ENGL 052)	6.48	4.88	1.60***
Success rate in academic courses (after ENGL 052)	55.4%	52.2%	3.3%
Number of academic courses attempted	9.38	6.72	2.65***
Success rate in academic courses	56.8%	52.6%	4.2%
<i>Followed One Year Post-ENGL 052</i>			
ENGL 052 pass	81.7%	69.4%	12.3%***
ENGL 101 attempt	100.0%	51.4%	48.6%***
ENGL 101 pass (grade "C" or better) – for all in cohort	74.0%	37.7%	36.3%***
ENGL 101 grade – conditioned on attempted	1.97	2.07	-0.10
ENGL 102 attempt	45.2%	16.4%	28.8%***
ENGL 102 pass (grade "C" or better) – for all in cohort	33.7%	11.6%	22.0%***
ENGL 102 grade – conditioned on attempted	2.15	2.15	0.00
Persist to next term (after ENGL 052)	76.0%	73.3%	2.7%
Persist to next year (after ENGL 052)	63.5%	55.7%	7.7%
Number of academic courses attempted (after ENGL 052)	4.69	3.63	1.06***
Success rate in academic courses (after ENGL 052)	56.3%	53.0%	3.3%
Number of academic courses attempted	9.38	6.72	2.65***
Success rate in academic courses	56.8%	52.6%	4.2%
Total Students	104	2,070	

*** $p < .01$.

Table A.3
Regression Estimates of the Effect of the Accelerated Learning Program

	ENGL 052 ALP vs. Non-ALP (Regular Developmental)						
Outcomes	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: ENGL 101 (Within a Year of ENGL 052)							
ENGL 101 attempt	0.486 (0.049)**						
ENGL 101 pass	0.363 (0.049)**	0.329 (0.039)**	0.323 (0.039)**	0.321 (0.040)**	0.324 (0.040)**	0.335 (0.046)**	0.180 (0.059)**
ENGL 101 grade (0 to 4 range)	0.905 (0.138)**	0.792 (0.116)**	0.777 (0.118)**	0.769 (0.120)**	0.776 (0.120)**	0.790 (0.148)**	0.439 (0.147)**
ENGL 101 pass, conditional on attempted	0.006 (0.045)	0.014 (0.035)	0.004 (0.036)	0.006 (0.037)	-0.004 (0.039)	0.039 (0.044)	0.158 (0.060)**
ENGL 101 grade (0 to 4 range), conditional on attempted	-0.103 (0.130)	-0.090 (0.105)	-0.114 (0.111)	-0.113 (0.113)	-0.143 (0.116)	-0.047 (0.145)	0.378 (0.163)*
ALP students (who attempted ENGL 101)		104 (104)			104 (104)	71 (71)	104 (104)
Non-ALP students (who attempted ENGL 101)		2,070 (1,064)			1,825 (934)	1,531 (798)	2,070 (1,064)
Panel B: ENGL 102 (Within a Year of ENGL 052)							
ENGL 102 attempt	0.288 (0.038)**	0.258 (0.042)**	0.254 (0.043)**	0.255 (0.044)**	0.245 (0.045)**	0.266 (0.056)**	0.162 (0.059)**
ENGL 102 pass	0.220 (0.033)**	0.203 (0.046)**	0.199 (0.047)**	0.200 (0.047)**	0.193 (0.048)**	0.200 (0.062)**	0.137 (0.065)*
ENGL 102 grade (0 to 4 range)	0.618 (0.100)**	0.565 (0.147)**	0.556 (0.149)**	0.561 (0.149)**	0.530 (0.151)**	0.564 (0.191)**	0.373 (0.202)+
ENGL 102 pass, conditional on attempted	0.036 (0.071)	0.040 (0.073)	0.033 (0.074)	0.039 (0.072)	0.039 (0.071)	0.009 (0.081)	-0.057 (0.121)
ENGL 102 grade (0 to 4 range), conditional on attempted	-0.004 (0.212)	0.052 (0.220)	0.048 (0.226)	0.060 (0.221)	0.030 (0.230)	-0.045 (0.244)	-0.114 (0.372)
ALP students (who attempted ENGL 102)		104 (47)			104 (47)	71 (33)	104 (47)
Non-ALP students (who attempted ENGL 102)		2,070 (340)			1,825 (303)	1,531 (258)	2,070 (340)

Panel C: Persistence and Success in College-Level Courses (Over the Year Following ENGL 052 Term)

Second term retention	0.027 (0.044)	0.025 (0.030)	0.017 (0.032)	0.006 (0.032)	0.024 (0.036)	-0.034 (0.042)	-0.218 (0.034)**
Second year retention	0.077 (0.050)	0.055 (0.052)	0.047 (0.051)	0.043 (0.051)	0.047 (0.052)	0.058 (0.061)	-0.189 (0.064)**
Total college-level courses attempted	1.061 (0.322)**	0.774 (0.304)*	0.721 (0.299)*	0.663 (0.301)*	0.744 (0.306)*	0.484 (0.377)	-1.536 (0.430)**
Success rate in college-level courses (grade "C" or better over attempted), conditional on academic course attempted	0.033 (0.043)	0.013 (0.036)	0.003 (0.037)	0.005 (0.036)	-0.013 (0.037)	0.005 (0.051)	0.023 (0.049)
Total college-level credits accrued	2.150 (0.831)**	1.443 (0.910)	1.286 (0.896)	1.193 (0.908)	1.037 (0.927)	0.944 (1.175)	-2.191 (1.194)+
ALP students (who attempted college-level courses after ENGL 052)	104 (84)		104 (84)		71 (56)	104 (84)	
Non-ALP students (who attempted college-level courses after ENGL 052)	2,070 (1,543)		1,825 (1,354)		1,531 (1,154)	2,070 (1,543)	
Student covariates	✓	✓	✓	✓	✓	✓	✓
Teacher full/part-time status		✓	✓	✓	✓	✓	✓
Cohort fixed effects				✓	✓	✓	✓
Excluding from control group Learning Communities sections					✓		
Restricting to first-time college students placed in ENGL 052 (developmental writing)					✓		
ENGL 101 teacher fixed effects (12 teachers with both ALP and non-ALP students)						✓	

Note. Standard errors (in parentheses) are clustered at the high school level. Sample are CCBC students placed into ENGL 052 (developmental writing) for the first time from fall 2007 through fall 2008. Students who took ENGL 052 before high school graduation or took ALP after taking a regular ENGL 052 are excluded. All outcome measures are defined over the one year time frame after ENGL 052 participation.

+ $p < .10$. * $p < .05$. ** $p < .01$.

Table A.4
Actual and Estimated Student Outcomes: ALP and Control Groups Compared

	Actual Rates (Model 1)			Estimated Rates Controlling for Student Characteristics (Model 2)			Estimated Rates, Controlling for Student Chars. + Teacher Effects (Model 7)		
	ALP	Non-ALP	Difference	ALP	Non-ALP	Est. Difference	ALP	Non-ALP	Est. Difference
Outcomes (Followed One Year Post-ENGL 052)	(1)	(2)	(1)-(2)	(3)	(4)		(5)	(6)	
ENGL 101 pass with C or better	74.0%	37.7%	36.3**	70.8%	37.9%	32.9**	56.6%	38.6%	18.0**
ENGL 101 grade (if attempted)	1.97	2.07	-0.10	1.93	2.02	-0.09	2.36	1.99	0.38*
ENGL 102 attempt	45.2%	16.4%	28.8**	42.4%	16.6%	25.8**	33.2%	17.0%	16.2**
ENGL 102 pass with C or better	33.7%	11.6%	22.0**	32.0%	11.7%	20.3**	25.8%	12.0%	13.7*
ENGL 102 grade (if attempted)	2.15	2.15	0.00	2.09	2.04	0.05	1.95	2.07	-0.12
Persist to next term (after ENGL 052)	76.0%	73.3%	2.7	75.8%	73.3%	2.5	52.7%	74.5%	-21.8**
Persist to next year (after ENGL 052)	63.5%	55.7%	7.7	61.4%	55.9%	5.5	38.2%	57.0%	-18.9**
Number of academic courses attempted (after ENGL 052)	4.69	3.63	1.06**	4.42	3.64	0.77*	2.22	3.76	-1.53**
Success rate in academic courses (after ENGL 052)	56.3%	53.0%	3.3	53.7%	52.5%	1.3	54.9%	52.7%	2.2
Academic credits accrued (after ENGL 052)	8.81	6.66	2.15**	8.13	6.69	1.44	4.67	6.87	-2.19†

† $p < .10$. * $p < .05$. ** $p < .01$.

**Table A.5
Cost Per Outcome: Traditional Model Versus ALP**

	Baseline Model (1)		Adjusted Model (2)	
	ALP	Traditional Model	ALP	Traditional Model
Students	250	250	250	250
ENGL 052				
Attempt rate	100%	100%	100%	100%
Cost of providing	\$135,917	\$73,325	\$135,917	\$73,325
Pass rate	81.7%	69.4%	81.7%	69.4%
Number of students who passed	204	174	204	174
Cost per pass (ENGL 052)	\$665	\$423	\$665	\$423
ENGL 101				
Attempt rate	100%	54.3%	100%	54.3%
Cost of providing ^a	\$73,325	\$39,815	\$73,325	\$39,815
Pass rate	75%	40%	74%	42%
Number of students who passed	188	100	183.75	105
Cost per pass (ENGL 052-ENGL 101)	\$1,116	\$1,131	\$1,139	\$1,078
ENGL 102				
Attempt rate	48.1%	22.4%	46.5%	24.0%
Cost of providing ^a	\$35,269	\$16,425	\$34,096	\$17,598
Pass rate	36.5%	16.6%	35.3%	17.8%
Number of students who passed	91	42	88.25	44.5
Cost per pass (ENGL 052-ENGL 101+ENGL 102)	\$2,680	\$3,122	\$2,757	\$2,938

Note. Outcomes data for baseline model (1) are from Table A.3, Model 1, and Table A.3, Model 5 for the adjusted model.

^a Cost assumes 20 students per section, as per traditional model.

Appendix B: Accelerated Learning Program, Community College of Baltimore County Cost Analysis Details

1. Overview

This appendix reports on the resources required and the costs of ALP, both in absolute terms and relative to the traditional model.

There are many ways to consider the cost implications of ALP. Our approach is to look at the implications for the college in terms of expenditures (net of revenues). Alternative approaches would be to look at the implications for the students taking ALP or for society as a whole. Also, the costs of ALP will vary according to the scale of the program (as measured by numbers of students enrolled), the class sizes, and how long the college will offer ALP. Costs may be expressed per cohort or per student.

Here, the costs are calculated using a simple ingredients method (Levin & McEwan, 2001). The ingredients method requires collection of data on the costs of program development and design, delivery (instruction), and administration or governance. Information on costs is based on responses to the research team's queries by CCBC administrators and faculty and on publicly available IPEDS data.

2. Ingredients and Prices

When ALP was introduced in 2007, it required new resources for development and design as well as for student recruitment. Recruitment was performed by two learning assistance coordinators. Marketing expenses for flyers and posters were also incurred. However, after two years, ALP was sufficiently integrated into the college program that no specific recruitment costs were necessary.

We can only approximate the costs of developing ALP. We assume that:

- The costs for the learning assistance coordinators were 0.2 full-time equivalents of a median income-earner in Baltimore;
- Marketing costs were \$2,000; and
- These development costs are amortized over ten years.

The annual cost of program development therefore approximates to \$1,400. This is a fixed cost independent of the numbers of students enrolled.

The main costs for educational programs are typically the instructor salaries and overhead costs. ALP and the traditional model are not greatly different in how they rely on instructors; the primary differences are in the compression of the developmental sequence and the group sizes for each section. In terms of absolute costs, there is no difference between a three-credit ENGL 101 course and the compressed version of the three-credit ENGL 101-with-ALP.

Program delivery costs are calculated based on faculty credit hours. At CCBC each faculty member must complete 15 credits per semester (30 credits per year). It is assumed that all faculty job tasks are a function of their full credit hours—a faculty member who teaches only 10 credits per semester must therefore be performing other tasks equivalent to 5 credits. Therefore, for each faculty member the overhead costs can be expressed in terms of faculty credit hours.

ALP and the traditional model may rely on faculty with a range of professorial standing. Approximately two thirds of the sections are taught by full-time associate professors in the English Department, and the remaining third are taught by adjunct faculty. Thus, it is necessary to cost out full-time and adjunct faculty costs separately. It is also critical to address the fact that adjunct faculty do not perform all the tasks that full-time faculty do. Specifically, adjunct faculty perform almost no “service” within colleges (such as advising students, devising curricula, or committee work), and they must be managed and mentored (often by full-time faculty).

Full details of the costs of faculty are given in Table B.1. These costs are calculated separately for full-time and adjunct faculty separately:

- Based on two sources of information, the average salary for an associate professor is approximately \$58,000–\$62,000.¹¹ To this salary must be added overhead costs, which are estimated to be 65% of salary costs.¹² Faculty service and management time is included, but it must be spread proportionately across all instructional hours at the college. This service time is assumed to be one third of all faculty time. The cost per credit is \$2,130.
- Based on reported costs from CCBC, the direct salary costs per adjunct professor are \$3,000 per three-credit course (not including overhead).

¹¹ Sources for faculty salaries are the IPEDS and the *Chronicle of Higher Education*. Average salaries at CCBC are higher than these figures, but a 10% adjustment to account for the lower salaries paid in the Humanities.

¹² IPEDS reports that only 51% of CCBC revenue is spent on instruction. The remainder is spent on other expenditures related to instruction such as clerical support, administration and facilities. Some of this expenditure is for other revenue-driven activities, but the proportion is small. So the full overhead rate is 96% of instructional costs. However, an alternative estimate of overhead costs is 30% of instructional costs (review of college overhead cost recovery rates). Therefore, the average of these two figures is used.

However, the service and management time per three-credit course must also be counted, even though adjunct faculty members do not perform this directly. The cost per credit is \$1,610.

Finally, no additional resources were required for ALP students in terms of counseling or support services beyond the services available to students in the traditional program. Also, ALP students did not receive any additional materials, such as textbooks or learning supports.¹³

Table B.1
Instructional Costs for Developmental Education: Salary Calculations

	Base Case	Upper Range
Salary for full-time faculty pa	\$58,000	\$62,000
Weighting for overheads	1.65	1.65
Weighting for service and other costs	0.67	0.67
Cost per FTE faculty pa (excl. service)	\$63,800	\$68,200
Number of credits	30	30
Cost per FTE faculty pa (excl. service) per credit	\$2,127	\$2,273
Cost of service	\$31,900	\$34,100
Number of credits by adjunct faculty per FT faculty	150	150
Cost in service per credit	\$212.67	\$227.33
Salary for no-service adjunct per credit	\$1,000	\$1,250
Weighting for overheads	1.4	1.4
Cost per no-service adjunct per credit	\$1,400	\$1,750
Cost of service per credit	\$213	\$227
Total cost per adjunct per credit	\$1,613	\$1,977

Sources: IPEDS data. College-level data.

3. Estimated Program Costs

The main determinant of cost differences between ALP and the traditional model is the interaction between credit hours and the enrollment in each developmental education section (offering of each course). It is assumed that the same proportions of full-time and adjunct faculty are used to teach either version of developmental education. Therefore, to get an estimate of the cost differential, it is necessary to make assumptions about the size of each section and the

¹³ Cost per student FTE is estimated at between \$7,300 and \$11,400.

overall enrollment. In fall 2008, the ALP program enrolled 77 students across 10 sections, or eight students per section. In a traditional model, section size equals 20.¹⁴

Table B.2 summarizes the cost implications, assuming a cohort of 250 students. In the traditional model the three-credit developmental courses (DEV) would cost \$73,325 in total, or \$293 per student. With ALP, the total cost for 250 students would be \$135,917, or \$544 per student.

On average, each developmental student costs \$250 more in instructional costs under DEV-ALP than under the traditional DEV course. With 250 enrollments per semester, the total additional cost would be \$62,592 in instruction plus an extra \$700 in program design costs. At most scales of enrollment, the ALP version of developmental education would cost approximately 85% more than the traditional model.

Table B.2
Instructional Costs for ALP versus the Traditional Model of Developmental Education

	Traditional Model	ALP
Total enrollment per semester	250	250
Students per section	20	8
Number of credits	3	2
Number of sections	12.5	31
Total cost per semester	\$73,325	\$135,917
Cost per student	\$293	\$544
Cost difference per student		\$250
Cost difference as percentage		85%

Note. Costs do not include program design costs. Number of credits refers to compensation for faculty. ALP students accrue three credits.

This figure must be interpreted carefully. First, this is the cost to the college of providing DEV-ALP over DEV. It must therefore be set against the tuition revenues paid by students to derive the net cost. Given that the college offers many programs, it is likely that this net cost of ALP is a very small fraction of the total college budget.

Critically, as noted above, this cost estimate does not count any of the benefits of DEV-ALP. These benefits might accrue to students, who may appreciate the cohesion of ALP and the greater certainty of a one-semester sequence. The benefits might also accrue to faculty, who may

¹⁴ Critically, it is assumed that the average section size is 20 for DEV, eight for DEV-ALP, and 20 for both ENGL 101 and ENGL 101-with-ALP. Thus, there are no cost implications for the two ENGL 101 options.

prefer teaching smaller groups and may be willing to work harder as a result. Fundamentally, the costs do not indicate whether students who take ALP have higher academic scores and progress further than students in the traditional program. At this stage, we do not relate the costs to the benefits of ALP.¹⁵

If ALP does influence students' progression, there are further cost implications. ALP may be justified in that it raises enrollment in ENGL 101-with-ALP in comparison to the traditional model, where only those students who pass the prerequisite developmental education course (DEV) may take ENGL 101. However, the ENGL 101 courses do not differ in credit hours or section size, so there is no net cost differential between ALP and the traditional model for providing ENGL 101.¹⁶

4. Sensitivity Analysis

These cost estimates may be subject to measurement error. The two most important assumptions are the cost per credit hour and the section size. (The program design costs are negligible when spread across entire cohorts and multiple years.)

First, we have assumed that the cost per credit hour is the same across each model. This reflects standard college practice of paying faculty based on such a formula without adjusting the formula for the ease of instruction or section size. It also reflects an assumption that the faculty teaching in each model are the same rank and that all faculty provide 30 credit hours (or the administrative equivalent) per year.

Second, we have assumed that the section sizes are 20 for DEV and eight for DEV-ALP (with equal sizes for any version of ENGL 101). Given our first assumption that faculty are compensated equivalently, almost the entire differential is attributable to these section size differences.¹⁷ Variances in section size will therefore drive the cost differentials.

¹⁵ A clear example of how this may be done is at <http://faculty.ccbcmd.edu/~padams/ALP/Site%20Folder/costs.html>.

¹⁶ When both DEV and ENGL components are counted, the cost differential falls to less than 50%.

¹⁷ We assume there are no differences in costs of block-scheduling DEV-ALP next to ENGL 101-with-ALP. (This may not be a legitimate assumption if the two classes meet in the same room and with different class sizes.) We also assume that there are no resource implications arising from the flexibility of having more sections of DEV and ENGL 101.