

# "Educational Advancement: Decision Influences Regarding Attendance and Level of Post-Secondary Education"

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## **Executive Summary**

The intent of this study was to determine which characteristics from a group of student, teacher, and school characteristics had a significant influence in affecting enrollment in education beyond high school. There are social benefits from having a more educated populace, the Kentucky political system has highlighted intentions to increase enrollment in institutions, and Kentucky has lagged behind the nation and most states in its ability to continue educating the populace beyond high school. Most of the previous efforts to examine postsecondary attendance decisions have focused on the demographics of students with the implication that those student characteristics are the major influence on attendance beyond high school. This piece has attempted to go beyond that assumption and consider additional characteristics of teachers and schools, since those attributes can be influenced by the state government and the majority of students will experience attributes of those two groups. Two different logit models found that the attendance decision was heavily influenced by student characteristics but also had connections with school and teacher attributes. In both of the models, socioeconomic status and ability measured via test appeared to be strong influences with those from higher socioeconomic status levels and those achieving higher test performances being more likely to continue with education. The decision to attend a college offering at most an associate's degree appeared to be less influenced by other characteristics. Only teacher evaluations and class differentiation (allowing different classes to fill the same requirement) had distinct positive influences. Teacher rewards were found to have a negative influence which was most likely due to allowing teachers to choose their own students or classes. The decision to attend a college or university that offered at least a bachelor's degree appeared to be more complex with influences from the location, the student's view of classes, counselor consultation, and some degree of facility quality influencing the decision. Recommendations based on the analysis include changing classes to involve differentiation, providing additional postsecondary information to students in high school, attempting to maintain a minimum level of facility condition, and targeting able students from lower social and economic settings. Unfortunately, the analysis was unable to determine what causes a student to be set on a specific decision path and can only provide suggestions to encourage more students to attend a postsecondary college or university.

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With the attendance of postsecondary education being optional, an individual's decision to continue with training past high school has become a topic of interest. While there are benefits associated with continued education, many individuals choose not to follow this path. Despite being a personal choice, the continued education of an individual still has an interest for society due to how an individual's level of education can affect other members of the community. For states like Kentucky, the topic of interest is how to encourage individuals to take actions that will benefit society as a whole. Thus, the question is what influences a person's decision to continue with postsecondary education and then how can be done with these influences, with an emphasis on secondary school education characteristics. The intent of this research is to examine which characteristics of the student, the student's teachers, and the student's schools appear to influence the postsecondary education decision.

To begin, Kentucky policy makers have acknowledged the benefits of post-secondary education participation. The state has devoted resources to improving postsecondary education enrollment with the establishment of the Council on Postsecondary Education. Pages two and three of the document outlining the Council's responsibilities explicitly state that postsecondary education was intended to improve standards of living and quality of life, with increased attainment of higher education levels being the primary means to that goal.<sup>1</sup> The Council's goals show there is already a need for this information.

In terms of the number involved, estimates from fall 2010 show that approximately 207,000 undergraduate students were enrolled in Kentucky's public postsecondary education schools. Universities were responsible for 100,000 students while the state's community and technical colleges enrolled 107,000 students. It was only in 2009 that community and technical college enrollment surpassed university undergraduate enrollment. These figures do not include the students who enrolled

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<sup>1</sup> Kentucky Council on Postsecondary Education, "Our Mission," posted September 2009. <<http://cpe.ky.gov/about/cpe/mission.htm>>

at a for-profit college.<sup>2</sup> While the numbers may not be a perfect representation due to variation in the amount of time students spent at these schools, they still show there are large numbers of individuals involved in the decision process and there is variation in the kind of school chosen.

Researchers seem to have confirmed the belief of policy makers regarding improved status through higher education. Enrico Moretti used data from the National Longitudinal Survey of Youths and the Census to look at how college graduates affected wages in a city in which they worked. He found that for every one percentage point increase in the supply of college graduates in the city, wages of high school drop-outs increased by 1.9 percent, wages of high school graduates increased by 1.6 percent, and wages of other college graduates increased by 0.4 percent.<sup>3</sup> His results imply that simply having more college graduates increases the economic conditions of others in society. Additional work by Meara, Richards, and Cutler found that individuals with more education were likely to live longer, with white males with any amount of education living 6.2 years longer than uneducated counterparts as one of their main examples.<sup>4</sup> Using results from the Current Population Survey of 2003-04, researchers estimated that 30-34 year old holders of bachelor's degrees were estimated to earn 77 percent more income than comparable individuals with only a high school education. It was also found that the average lifetime societal benefit of a bachelor's degree-holding worker was \$339,000 for men and \$250,000 for women after considering government funding of higher education.<sup>5</sup> These results suggest that increasing the level of an individual's education will either improve the productivity of an area,

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<sup>2</sup> Kentucky Council on Postsecondary Education, "10 Year Enrollment," posted Spring 2011 <[http://dataportal.cpe.ky.gov/2010/Enrollment/10yearenrollment2010\\_20110124.pdf](http://dataportal.cpe.ky.gov/2010/Enrollment/10yearenrollment2010_20110124.pdf)>.

<sup>3</sup> Enrico Moretti, "Estimating the Social Return to Higher Education: Evidence from Longitudinal and Repeated Cross-sectional Data," *Journal of Econometrics*, Vol 121, 2004, p175-212.

<sup>4</sup> Ellen R. Meara, Seth Richards, and David Cutler, "The Gap Gets Bigger: Changes in Mortality and Life Expectancy, By Education" *Health Affairs*, Vol. 27(2): 2008.

<sup>5</sup> Kent Hill, Dennis Hoffman, Tom Rex, "The Value of Higher Education: Individual and Societal Benefits," Productivity and Prosperity Project, October 2005. <[http://wpcarey.asu.edu/seid/upload/Value%20Full%20Report\\_final\\_october%202005a.pdf](http://wpcarey.asu.edu/seid/upload/Value%20Full%20Report_final_october%202005a.pdf)>

increase their productive years so they contribute more to society, or allow the individuals to be more self-sufficient so they are less likely to rely on governmental aid to survive.

The rest of the current research is concerned with the question of what factors appear to be associated with a decision to seek education beyond high school. During subsequent discussions, postsecondary schools will be referred to by their type of institution to prevent confusion with the different terms for a school. Consistent with the National Center of Education Statistics' use of the term, an institution is defined as an organization with a primary mission of providing postsecondary education or training beyond high school. Those that only offer leisure and adult basic education programs are excluded. A four-year institute is one that offers at least a bachelor's degree while a two-year institute offers at most an associate's degree.<sup>6</sup>

The next section will be concerned with providing additional background information, followed by a review of previous literature involving the subject. Then, the dataset used will be described and the data analysis procedure will be explained. A discussion of results will then be followed by suggestions for improving enrollment. Finally, the limitations of the work are acknowledged and explained.

## **Background**

While Kentucky has a large number of students going to these institutions, the state has not kept pace with the rest of the nation. Data from the 2007 American Community survey shows that Kentucky residents past the age of 25 have lower rates of postsecondary experience than the national average. While the US average for bachelor's degree attainment is at 17.1 percent, only 11.8 percent of Kentucky's residents have earned that degree. Kentucky's associate degree attainment rate of 6.5 percent is close to the national average of 7.4 percent, but Kentucky lags in even having some degree of

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<sup>6</sup> Knapp, Kelly-Reid, Ginder, "Enrollment in Postsecondary Institutions, Fall 2009; Graduation Cohorts; and Financial Statistics, Fiscal Year 2009," National Center for Education Statistics, February 2011. <<http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2011230>>

college experience and no degree with only 18.4 percent of residents having experience without a degree compared to the nation's 19.5 percent.<sup>7</sup>

Data from the five years prior to those estimates indicates there is a degree of natural change but not massive change. Kentucky's rate of growth for degree obtainment has actually been faster than the national change. From 2001 to 2006, the national average of associate's degree attainment grew 0.8 percentage points to 7.4 percent. Kentucky's rate grew by more than a full percentage point from 5.1 percent to 6.5 percent. A similar comparison between rates of change is seen in the bachelor's degree attainment estimate. Here the national average grew from 16.3 percent to 17.1 percent, a change of 0.8 percentage points, whereas Kentucky's rate increased from 10.8 percent to 11.8 percent, a change of a full percentage point.<sup>8</sup> The Council does not have information from beyond this point so it cannot be said if the pattern has continued. Initially the differences between the growth rates would suggest that Kentucky is growing closer to the national average but the low growth rates would point at the two rates' convergence point to be far in the future, even if the higher continue in Kentucky.

Beyond the national comparison, Kentucky does not compare well to individual states. Using data from the Census and the Current Population Survey of 2004, the Institute for Higher Education Policy ranked states based on the percent of residents owning a bachelor's degree. Among the fifty states, Kentucky was found to have the second lowest percentage of residents with a bachelor's degree, at 12.4 percent, with only West Virginia having a lower rate. This report has the degree estimate at a one percentage point higher level than the previous report, but there is still a large gap between the

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<sup>7</sup> Kentucky Council on Postsecondary Education, "Educational Attainment in Kentucky and the United States," posted November 1, 2007. < [http://cpe.ky.gov/NR/rdonlyres/91FDC413-3344-4189-9A8B-405B6B183B02/0/Ed\\_Attainment\\_KyUS\\_20071101.pdf](http://cpe.ky.gov/NR/rdonlyres/91FDC413-3344-4189-9A8B-405B6B183B02/0/Ed_Attainment_KyUS_20071101.pdf)>

<sup>8</sup> Ibid.

average 18.1 percent or compared to the fourteen states where 20.0 percent or more residents have a bachelor's degree.<sup>9</sup>

These reports suggest that Kentucky remains behind the rest of the country in postsecondary education. While associate's degrees are relatively similar, there is a rather large gap between Kentucky and other states for bachelor's degrees. This gap supports the need to find ways to increase interest in and likelihood of attending a four-year institution to obtain degrees. Increasing chance to go to a two-year institution does not appear to be as important, but such decisions still yield benefits to society.

In order to help improve the situation, Kentucky's Council on Postsecondary Education has implemented several programs to improve continued education rates. The Council's GEAR UP program is a federally funded program designed to help at-risk students improve their skills by providing information and counseling as students make postsecondary education decisions. The program follows students from the seventh grade to their first year of college, but the program is voluntary for schools. Schools must not only be aware of the program but must be willing to cooperate with GEAR UP members to create education plans for the cohort of students that will participate in the program.<sup>10</sup> For students who have difficulties accessing postsecondary education due to location, the state has established an extended campus program. The program allows colleges or universities to provide courses outside of the institution's original location as long as the Council approves the curriculum and structure of the new courses.<sup>11</sup> Finally, the Council offers online programs to instructors seeking an additional postsecondary degree. The programs are grouped with an initiative to increase achievement

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<sup>9</sup> Institute for Higher Education Policy, "The Investment Payoff," February 2005.

<<http://www.ihep.org/Publications/publications-detail.cfm?id=43>>

<sup>10</sup> Council on Postsecondary Education, "GEAR UP Kentucky," updated March 3, 2010.

<<http://cpe.ky.gov/policies/academicinit/GearUp/default.htm>>

<sup>11</sup> Ibid, "Guidelines for New Extended Campus Program," Quality and Accountability Policy Group, 2008.

<[http://cpe.ky.gov/NR/rdoonlyres/18981D86-F10F-4A5E-AE49-5B4C4316C4E6/0/3C\\_NewExtendedCampusGuidelines.pdf](http://cpe.ky.gov/NR/rdoonlyres/18981D86-F10F-4A5E-AE49-5B4C4316C4E6/0/3C_NewExtendedCampusGuidelines.pdf)>



of students by improving the qualifications of school personnel.<sup>12</sup> Despite being in use for years, the Council does not provide information on use or success of any of these initiatives, besides stating that the GEAR UP program is currently involved with three cohorts of students.

## **Literature Review**

In looking at the research on factors influencing the continuation of education, the works have generally focused on characteristics of the student and the family. In contrast to the demographics, characteristics of the school have received less attention. Articles considering influences on dropout rates were also included in the study. High school dropouts represent a counterpart to continued education with the student choosing to end studies early instead of extending the length. It is possible that the factors influencing dropout rates would also influence postsecondary attendance but in the opposite direction.

Factors seen as consistently related to college access include socioeconomic status and race. It has generally been found that those from low-income families, those whose parents have not attended college and minority students are less likely to enroll in college.<sup>13</sup> Such individuals are less likely to have resources available to them and may have to rely more on resources that can be provided in their schools. It has been found that lack of resources tends to disproportionately affect black and Hispanic students, causing them to have less support than white students. In particular, they tend to lack family members with high educational attainment and positive schooling experiences who would be able to provide encouragement to the students.<sup>14</sup> These influences make the inclusion of race and status important in capturing the effects of a student's background.

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<sup>12</sup> Ibid, "Teacher Quality Initiatives," 2007. < <http://cpe.ky.gov/policies/academicinit/TeacherQuality/>>

<sup>13</sup> Perna, et al., "A Typology of Federal and State Programs Designed to Promote College Enrollment," Journal of Higher Education, Vol. 79 (3), 2008.

<sup>14</sup> Amy Bergerson, "College Choice Processes for Students of Color," ASHE Higher Education Report, 35(4), 2009.

Plank and Jordan suggest that providing additional information about colleges can improve the chances a student will continue education. Using data from the 1988 version of the Educational Longitudinal Study (ELS), they found that increased levels of information and guidance during college preparation and selection times were positively and significantly correlated with continued education. Students with more information at their disposal were also more likely to attend a four-year college instead of a two-year college.<sup>15</sup> Considering that those less likely to attend are also those with fewer family resources, it is not surprising to see that information assistance from schools increases the likelihood of attendance.

Another school characteristic of note is whether the student believes the high school is adequately preparing students for college. Pitre surveyed 241 students from the state of Maryland in an attempt to see differences between anticipations of children of different races. When he asked the students in general about how well they felt their school was preparing them for college, he was able to compare it to their aspirations. The results said that students who replied that they were not being well prepared were 33 percent less likely to have intentions for college attendance.<sup>16</sup> It is not surprising to imagine a lack of interest from these students since they may not feel they have adequate abilities to continue on in their studies.

Research by Rowan-Kenyon implies these responses are reflected in later actions. She used information from the 1988 edition of the ELS to try to determine what influenced when a person attended a post-secondary institute. Those who waited or never attended had lower achievement scores and lower levels of math courses than those who immediately enrolled, despite the fact that

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<sup>15</sup> Stephen Plank and Will Jordan, "Effects of Information, Guidance, and Actions on Postsecondary Destinations: A Study of Talent Loss," American Educational Research Journal, Vol. 38 (4), 2001.

<sup>16</sup> Paul Pitre, "College Choice: A Study of African American and White Student Aspirations and Perceptions Related to College Attendance," College Student Journal, Vol. 40(3), 2006.

community colleges generally do not have strict testing requirements for entry.<sup>17</sup> In this situation, the author uses the math course as an example of a class intended to help a student develop college-necessary skills. It appears that having low performance on tests or not having challenging courses is enough to make a student at least hesitate about attending one of these institutes.

The work of Christle, Jolivette, and Nelson involved trying to find connections between school characteristics and dropout rates by using data from Kentucky schools. The most relevant section consisted of a comparison between the twenty schools with the lowest rates and the twenty schools with the highest rates with observers rating classrooms and facilities on a premade scale. Schools with the lowest rates tended to be those where teachers were more professional and interacted more with the students. Additionally, the schools with low rates tended to have facilities that were cleaner and more orderly.<sup>18</sup> The results of their work suggest that both teaching style and the physical environment affect the decisions of the student. While there is some subjectivity to the analysis, it still implies that having a teacher focused on the students can improve educational decisions. Consideration of the facility may involve a measurement of how the student judges or feels about the environment.

The literature available for the postsecondary education topic places a heavy emphasis on characteristics of the student and family. It suggests that the strongest influences come from the socioeconomic background. As students' backgrounds improve, it seems that they receive more support and resources to improve their chances of continuing their education. School characteristics seem to receive relatively less attention. The current research focuses on assessing the provision of additional resources to the student, generally in the form of knowledge regarding post-secondary education enrollment and benefits. The remaining sections of literature examine whether a lack of sufficiently

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<sup>17</sup> Heather Rowan-Kenyon, "Predictors of Delayed College Enrollment and the Impact of Socioeconomic Status," *Journal of Higher Education*, 78 (2), 2007.

<sup>18</sup> Christine Christle, Kristine Jolivette, Michael Nelson, "School Characteristics Related to High School Dropout Rates," *Remedial & Special Education*, Vol. 28 (6), 2007.

challenging courses or engaging teachers leads to less interest in continuing education beyond high school. There is an implication of benefits from facilities but no specifics were found.

### **Data Description**

To examine influences on postsecondary attendance, data from the Education Longitudinal Study of 2002 was used. The study was commissioned by the National Center for Education Statistics (NCES) to follow a national group of students from their second year of high school to their post-secondary experiences in order to see how their high school experiences and characteristics affect their entrance into the labor market and level of education attainment. As a longitudinal study, the researchers attempted to follow the same individuals through the course of the study. The data also has multiple levels since information was collected from the students, their parents, their teachers, school librarians, and school officials.<sup>19</sup>

The first round of the study was conducted in 2002, where 750 schools were randomly chosen and then approximately 15,000 students were randomly selected from those schools. Non-public schools were sampled at a higher rate to ensure there could be comparisons with public schools. Similarly, Asian students were sampled at a higher rate to ensure there could be comparisons with White, Black, and Hispanic students but observation weighting factors were included so that estimates could be nationally representative. The students were given a survey to measure personal characteristics and attitudes, and were then given cognitive tests in mathematics and reading to measure ability. Surveys were also given to the parents to measure characteristics of the family, to mathematics and English teachers of the students for information on teacher attributes, and to principals to obtain characteristics of the schools.

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<sup>19</sup> "Education Longitudinal Study of 2002 (ELS: 2002) – Overview: Purposes," *National Center for Education Statistics*. <<http://nces.ed.gov/surveys/els2002/>>

Follow-up surveys were conducted in 2004 and 2006 to gain more information about the student's activities after high school. Participants were given a web-based interview, computer-assisted telephone interview, or computer assisted personal interview to determine their current employment or education activities.<sup>20</sup> By the most recent follow-up, there were only 12,591 individuals who had been a part of all three steps. At the third estimate, about 64 percent of respondents had moved to a postsecondary institution though only about 42 percent were attending a four year college or university.

This dataset was used due to the large body of information that had been collected over the three interview periods. Unfortunately, the data has regional locations instead of state locations due to privacy concerns. While it is a national sample, there is no comparable state database for characteristics of students, teachers, and schools. As long as there is not a major degree of variations across regions, then results should be applicable to Kentucky students.

## **Research Methods**

To examine what characteristics of students, teachers, and schools influence the decision to attend a two-year or a four-year institution, two logit models were created. Logit analysis is based on the idea that individuals tend to have a propensity towards certain actions, even though observers only see whether an individual does or does not do some action. A logit model attempts to predict the propensity of an individual towards certain actions and give a likelihood of the person acting in that manner. Since it is only a likelihood estimate, it is still possible for individuals to have a low likelihood of acting in a particular manner but then acting in that way in fact, or vice versa. The important observation was whether an individual did or did not attend an institution, and this binary outcome makes the logit method an appropriate form of analysis. P-values below or equal to a value of 0.05 were considered to be significant.

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<sup>20</sup> "Education Longitudinal Study of 2002 (ELS: 2002) – Survey Design and Sample Sizes," *National Center for Education Statistics*. < <http://nces.ed.gov/surveys/els2002/surveydesign.asp> >

The two models used examined the likelihood of attending a two-year school versus not attending and the likelihood of attending a four-year school versus not attending. The decision is separated between the levels to highlight the differences in the decision to attend one type of school or another. While some variables may influence attendance in general, it may be true that specific variables have different effects or are only relevant when considering attending a specific level of institution. Variables that have a positive effect in both models should increase the chance of continued education in general, those with a negative effect in both models should decrease the chance in general, and changes in signs across the models should suggest different effects based on the level of postsecondary institute.

The variables used to explain the behavior of students can be grouped into characteristics of the students, the teachers, and the schools. Student characteristics are expected to be strong indicators of future actions, and may indicate which types of students are more likely to continue education regardless of any influences from their high schools. Teacher and school characteristics are easier to influence through policy than personal characteristics and represent a possible way to influence behavior through changes in policy. For categorical variables, one value of each category was excluded so that other groups within the category had a basis of comparison. Additional dummy variables were created to compensate for missing observations. The variable for missing variables should generally be non-significant to represent that observations were missing randomly. If significant, it implies there is a reason behind the variables being missing and may represent a problem with its use if there is not a reasonable explanation behind the significance.

A composite of socioeconomic status indicators was used to determine background. The composite included the highest level of education earned by the student's parents, the income of the family, and an estimate of the parents' occupations' prestige, based on sociological research. A

student's ability was based on mathematics and English language scores from a standardized test created for the survey. Other characteristics included were sex and race of the student.

The first teacher characteristic included was the level of education and was divided into whether the math and English teachers had at most a Bachelor's degree, certification or professional training beyond that, or at least a Master's degree. Level of education for the teacher can be seen as type of qualification and could influence what effects the teacher has on a student. Related to this consideration is whether teachers lead classes that are within the field in which they earned a degree. It may be true that teachers out-of-field have more difficulties due to knowing less content in a field and could influence a student's later decision. This aspect was measured by using the percent of teachers teaching out-of-field at a student's school.

Variables indicating whether teachers evaluate other teachers and whether good teachers receive awards, based on the individual schools' judgment of what was a "good" teacher, were included. Rewards varied between extensive measures, such as allowing good teachers to choose the students or classes they taught, to smaller measures such as simply being recognized by the school. Both of these provide incentives for teachers to improve student outcomes in order to be well regarded.

Characteristics of the school included location, facility conditions, and education policy characteristics. Location included both the urban setting of the school and its geographic region. Schools were divided into groups based on whether they were in an urban, suburban, or rural region. Geographic region was separated into Northeast, Midwest, West, and South based on regions used in the national census. Whether or not a counselor met with a student for information about college was included based on previous research findings that indicated its importance. Information on whether students create career plans was included because the plans may influence how the students behave in the future, similar to how information from counselors influence students, and significant results may give an indication of the effectiveness of these programs. The presence of academic databases is an

extension of this concept since the databases may provide information so that students discover their interests.

Students' opinions on whether classes were interesting or challenging were included since it is assumed that students may be less likely to continue their education if they do not find any interest in their classes, and significant negative effects may imply that classes are not quite meeting the needs of students. The inclusion of this variable brings in the concern of endogeneity, since it would be likely for students who find classes to be more interesting to also be the students who perform better on standardized tests. However, covariance tests suggested there was not a strong relation between the class ratings and the performance of students. Table 1 included below shows there is not a strong pattern between ratings and standardized tests results.

Table 1: Cross Tabulation of SES Quartiles and Students' Views of Classes

Key					
Frequency					
Row Percentage					
Column Percentage					
Student Finds Classes Interesting and Challenging					
Test Quartiles	Strongly Agree	Agree	Disagree	Strongly Disagree	Total
First Quartile (Low)	383	1,223	848	222	2,676
	14.31	45.70	31.69	8.30	100.00
	31.47	19.91	19.00	26.15	21.12
Second Quartile	235	1,365	1,131	208	2,939
	8.00	46.44	38.48	7.08	100.00
	19.31	22.22	25.34	24.50	23.19
Third Quartile	244	1,608	1,293	214	3,359
	7.26	47.87	38.49	6.37	100.00
	20.05	26.18	28.97	25.21	26.51
Fourth Quartile (High)	355	1,947	1,191	205	3,698
	9.60	52.65	32.21	5.54	100.00
	29.17	31.69	26.69	24.15	29.18
Total	1,217	6,143	4,463	849	12,672
	9.60	48.48	35.22	6.70	100.00
	100.00	100.00	100.00	100.00	100.00

Source: Education Longitudinal Study of 2002, National Center for Education Statistics

Additionally, a variable was included to consider how schools arrange classes for students of different abilities since this factor can also influence views and resulting attitudes towards education.



Schools with differentiated classes were those that offered multiple classes that satisfied the same requirements but the classes had different levels of difficulty and amount of content that were suited to students with different levels of ability. These schools were further broken into those that grouped students into differentiated classes based on past performance and those that allowed students to pick which class they wanted to take as long as pre-requisites were met.

Facility conditions considered included general poor conditions of buildings, lack of space, lack of supplies, and inadequate lighting, heating, or air. For each of these, students were asked whether conditions related to those aspects hindered their ability to learn, with research literature suggesting those bothered by the conditions have a worse impression of the learning process and are less likely to be interested in continuing education. Members of the survey team were asked to see if schools had clean walls and floors and this information was included as a minimum measure of condition quality. The guideline for these observations was simply whether the members saw any markings on these areas that were not there for a program or event. If a school could not manage to even be clean, then effects may be similar to the other facility quality variables.

## **Research Findings**

The analysis of results from the two logit models are discussed separately and then the two models are compared to produce an overall view of behavior.

### *Attending a two-year institution*

The results of the two-year model can be found in Table 2. Student characteristics in general seem to have a significant effect, as expected. The socioeconomic status variable returned a positive influence and it appears that, as a student's background improves, the probability that they will attend a two-year institute instead of not attending improves as well. While this result may represent a kind of

viewpoint towards continuing education, it may also be implying that students of lower socioeconomic status have more difficulty in improving their education level regardless of the students' abilities.

Table 2: Results from Two-year Institute Decision Model

Robust					Robust				
Variable	Coef.	Std. Err.	z	P>z	Variable	Coef.	Std. Err.	z	P>z
Socioeconomic Status Composite	0.501	0.089	5.620	<0.001	Academic Database Available	-0.107	0.098	-1.090	0.276
Math Test Score	0.024	0.008	3.090	0.002	Courses are Interesting and Challenging ("Strongly Agree" excluded)				
English Test Score	0.007	0.007	0.920	0.357	Agree	-0.090	0.219	-0.410	0.682
Female	0.269	0.100	2.700	0.007	Disagree	-0.204	0.220	-0.920	0.355
Race (Caucasian Excluded)					Strongly Disagree	-0.429	0.276	-1.550	0.120
Amer. Indian/Alaska Native	-1.043	0.386	-2.700	0.007	<Missing>	-1.878	0.651	-2.880	0.004
Asian, Hawaii/Pac. Islander	0.613	0.173	3.550	<0.001	Teach Students Differently (Undifferentiated classes excluded)				
Black or African American	-0.161	0.224	-0.720	0.472	Differentiated w/Pre-Requisites	0.410	0.145	2.830	0.005
Hispanic, No Race Specified	-0.059	0.200	-0.290	0.770	Differentiated w/Grouping	0.164	0.145	1.130	0.259
Hispanic, Race Specified	-0.088	0.214	-0.410	0.681	Other	0.123	0.372	0.330	0.742
Multiple Race	-0.463	0.194	-2.380	0.017	<Missing>	0.279	0.281	0.990	0.321
Highest Degree of English Teacher (Bachelor's or less excluded)					Poor Building Conditions Hinder Learning ("Not at all" excluded)				
Edu. Specialist/ Prof. Diploma	-0.098	0.285	-0.340	0.731	Very Little	-0.052	0.168	-0.310	0.756
Master's or higher	0.124	0.110	1.120	0.261	To Some Extent	-0.023	0.226	-0.100	0.919
<Missing>	0.005	0.130	0.040	0.970	A lot	-0.442	0.310	-1.430	0.154
Highest Degree of Math Teacher (Bachelor's or less excluded)					<Missing>	-0.477	0.801	-0.600	0.552
Edu. Specialist/ Prof. Diploma	-0.096	0.367	-0.260	0.794	Poor Heating, Air, Light, Hinder Learning ("Not at all" excluded)				
Master's or higher	-0.180	0.111	-1.630	0.104	Very Little	-0.150	0.152	-0.990	0.323
<Missing>	-0.093	0.147	-0.630	0.529	To Some Extent	-0.029	0.211	-0.140	0.890
Out of Field Teachers	0.005	0.003	1.930	0.054	A lot	-0.005	0.304	-0.020	0.987
Out of Field Teachers (Missing entries)	0.160	0.194	0.830	0.408	<Missing>	-0.104	0.826	-0.130	0.900
Teachers Evaluate Teachers	0.364	0.166	2.190	0.028	Lack of Space Hinders Learning ("Not at all" excluded)				
Teachers Evaluate Teachers(Missing entries)	0.005	0.309	0.020	0.987	Very Little	-0.405	0.154	-2.630	0.009
Good Teachers Receive Awards	-0.221	0.104	-2.120	0.034	To Some Extent	-0.166	0.154	-1.080	0.282
Teachers Receive Awards (Missing entries)	-0.499	0.329	-1.520	0.129	A lot	-0.019	0.247	-0.080	0.939
Urbanicity (Urban area excluded)					<Missing>	0.691	0.439	1.570	0.116
Suburban	-0.081	0.124	-0.660	0.511	Lack of Supplies Hinders Learning ("Not at all" excluded)				
Rural	-0.203	0.160	-1.270	0.204	Very Little	0.024	0.133	0.180	0.858
GeographicRegion (Northeast area excluded)					To Some Extent	0.055	0.200	0.280	0.783
Midwest	0.200	0.164	1.220	0.223	A lot	0.000	0.571	0.000	0.999
South	0.114	0.145	0.780	0.434	<Missing>	-0.160	0.506	-0.320	0.751
West	0.301	0.173	1.740	0.081	Facilities Appear Clean	0.079	0.106	0.750	0.455
Counselor gave information	0.135	0.099	1.360	0.174	Dummy(MissingCleanFacilities)	-0.061	0.299	-0.210	0.837
Students Develop Career Plans ("None do" excluded)					Black student in urban area	0.160	0.385	0.410	0.679
Yes, some do	0.175	0.143	1.230	0.219	Constant term	-0.818	0.436	-1.880	0.061
Yes, all students do	-0.079	0.162	-0.490	0.626					
<Missing>	-0.172	0.347	-0.500	0.620					

Observations: 5,088 individuals

Prob > chi2 = <0.0001

A variable highlighted in red is significant at the 0.05 level.

Source: Education Longitudinal Study of 2002, National Center for Education Statistics

Similarly, math test score results return a positive increase of probable attendance and suggest that higher levels of ability make attendance at a two-year institute more likely. However, the English test scores actually do not have an effect in this case. While it isn't surprising that more talent presents more opportunities to continue development, it could be concerning that even two-year institutions many not be accessed by those with low abilities. Other results suggest that women, Asian, Hawaiian, and Pacific-Islander students are more likely to continue to a two-year school while American-Indians and those who declared multiple races are more likely to not attend. It should be noted that the Asian, Hawaiian, and Pacific-Islander students were grouped together by the original researchers so the effects may not be consistent across those groups.

For the teacher characteristics, it appears that students of teachers who evaluate each other are more likely to continue to a two-year institute than those who do not. However, having good teachers be rewarded appears to have a negative effect on the attendance decision. This may initially seem odd but one of the rewards for these teachers included being able to choose which students or classes they would instruct. It is possible that these teachers tend to pick the best students in order to reduce the difficulty of their occupation. The results from the test variables suggests that better students are already more likely to attend a two-year institution, so the students less likely to continue could be by less-able instructors. Level of education of the teacher has no effect on this attendance decision at all. The percentage of out-of-field teachers is insignificant.

For school attributes, a school having differentiated classes with only pre-requisites instead of grouping the students or having undifferentiated classes seems to make students more likely to continue on to a two-year institution. The dummy variable representing missing opinions of whether a class as interesting or challenging is negative and significant. According to the dataset's codebook, this variable was different from the others in that about half of the missing observations came from students who refused to answer that specific question. If this represents a strong dislike of the classes, then the negative nature of the associated effect is understandable. The four-year model in the next section sheds some light on this peculiarity. Another result from the two-year model is that students who said a lack of space hindered education "very little" were less likely to go to a two-year institution than those who provided any other answer. With the differences between students who answered with any other response and the excluded "Not at all" being insignificant and none of the other related variables having significance, it is likely that this result is an anomaly within the data. Otherwise, urban and geographic location, counselor participation, career planning, presence of an academic database, and most conditions of the school facility all appear to have no effect.

The variable for black students living in an urban environment was added due to unusual results in the next sections. Early tests returned unusually positive inclinations for black students to attend a four-year institution that were inconsistent with the data and expectations. An interaction term for being black and attending an urban school was inserted into the model under the hypothesis that effects from the urban setting were being picked up by the student's race. The term was not significant in either model, but brings the final version of the four-year institution model in line with reasonable estimations.

#### *Attending a four-year institution*

The second model depicts the choice between not continuing education and attending a four-year institution. For any results with the same sign as in the two-year model, a similar explanation would

be expected with the only difference being that a positive result makes a student more likely to attend a four-year institution instead of a two-year institution. The results may be found in Table 3.

Table 3: Results from Four-year Institute Decision Model

Variable	Coef.	Robust Std. Err.	z	P>z	Variable	Coef.	Robust Std. Err.	z	P>z
Socioeconomic Status Composite	0.923	0.087	10.550	<0.001	AcademicDatabaseAvailable	-0.229	0.108	-2.110	0.035
Math Test Score	0.091	0.009	10.530	<0.001	Courses are Interesting and Challenging ("Strongly Agree" excluded)				
English Test Score	0.053	0.008	6.340	<0.001	Agree	-0.291	0.269	-1.080	0.279
Female	0.280	0.114	2.460	0.014	Disagree	-0.650	0.280	-2.320	0.020
Race (Caucasian Excluded)					Strongly Disagree	-0.929	0.344	-2.700	0.007
Amer. Indian/Alaska Native	-0.477	0.442	-1.080	0.281	<Missing>	-2.357	0.703	-3.350	0.001
Asian, Hawaii/Pac. Islander	0.714	0.172	4.150	<0.001	Teach Students Differently (Undifferentiated classes excluded)				
Black or African American	0.355	0.256	1.390	0.165	Differentiated w/Pre-Requisites	0.695	0.155	4.480	<0.001
Hispanic, No Race Specified	-0.167	0.227	-0.730	0.463	Differentiated w/Grouping	0.029	0.159	0.180	0.855
Hispanic, Race Specified	-0.009	0.250	-0.030	0.973	Other	0.915	0.419	2.180	0.029
Multiple Race	-0.471	0.214	-2.200	0.028	<Missing>	0.400	0.318	1.260	0.209
Highest Degree of English Teacher (Bachelor's or less excluded)					Poor Building Conditions Hinder Learning ("Not at all" excluded)				
Edu. Specialist/ Prof. Diploma	-0.092	0.224	-0.410	0.682	Very Little	0.193	0.189	1.020	0.308
Master's or higher	0.125	0.121	1.030	0.301	To Some Extent	0.137	0.236	0.580	0.562
<Missing>	0.080	0.140	0.570	0.569	A lot	-1.148	0.549	-2.090	0.036
Highest Degree of Math Teacher (Bachelor's or less excluded)					<Missing>	-1.248	1.008	-1.240	0.216
Edu. Specialist/ Prof. Diploma	-0.805	0.460	-1.750	0.080	Poor Heating, Air, Light, Hinder Learning ("Not at all" excluded)				
Master's or higher	0.036	0.114	0.320	0.751	Very Little	0.013	0.164	0.080	0.935
<Missing>	-0.181	0.173	-1.050	0.294	To Some Extent	0.118	0.231	0.510	0.610
Out of Field Teachers	-0.002	0.003	-0.570	0.571	A lot	0.496	0.349	1.420	0.155
Out of Field Teachers (Missing entries)	0.338	0.218	1.550	0.121	<Missing>	1.078	0.760	1.420	0.156
Teachers Evaluate Teachers	0.254	0.161	1.570	0.116	Lack of Space Hinders Learning ("Not at all" excluded)				
Teachers Evaluate Teachers(Missing entries)	-0.657	0.376	-1.750	0.080	Very Little	-0.432	0.167	-2.590	0.010
Good Teachers Receive Awards	-0.372	0.114	-3.250	0.001	To Some Extent	-0.213	0.168	-1.270	0.205
Teachers Receive Awards (Missing entries)	-0.701	0.391	-1.790	0.073	A lot	-0.049	0.256	-0.190	0.848
Urbanicity (Urban area excluded)					<Missing>	0.684	0.507	1.350	0.177
Suburban	-0.472	0.124	-3.810	<0.001	Lack of Supplies Hinders Learning ("Not at all" excluded)				
Rural	-0.526	0.157	-3.350	0.001	Very Little	-0.166	0.144	-1.150	0.249
Geographic Region (Northeast area excluded)					To Some Extent	-0.693	0.224	-3.090	0.002
Midwest	0.017	0.167	0.100	0.919	A lot	0.078	0.420	0.190	0.852
South	-0.070	0.147	-0.480	0.631	<Missing>	-0.457	0.774	-0.590	0.555
West	0.068	0.188	0.360	0.718	Facilities Appear Clean	0.304	0.116	2.610	0.009
Counselor gave information	0.237	0.107	2.220	0.026	Dummy(MissingCleanFacilities)	0.371	0.322	1.150	0.250
Students Develop Career Plans ("None do" excluded)					Black student in urban area	0.574	0.382	1.500	0.134
Yes, some do	-0.103	0.163	-0.640	0.525	Constant term	-5.571	0.532	-10.460	<0.001
Yes, all students do	-0.330	0.170	-1.940	0.052					
<Missing>	-0.252	0.326	-0.770	0.439					

Prob > chi2 = <0.0001

A variable highlighted in red is significant at the 0.05 level.

Source: Education Longitudinal Study of 2002, National Center for Education Statistics

As in the previous model, student characteristics still have a strong influence. Higher levels of socioeconomic status and test results make students more likely to go on a four-year institution, though it is interesting to see that English test scores now have an influence in the decision. Women are once

again more likely to attend than men. Race results are different in that the Asian, Hawaiian, and Pacific Islander groups are still more likely to further their education while those from a background of multiple races are less likely but there is no longer a significant effect associated with being an American Indian.

The education levels of teachers also produce results similar to the previous model since there is no significant effect associated with education beyond a bachelor's degree. The variable for whether good teachers receive awards still has a negative significant effect in this model, but teachers evaluating other teachers no longer provide a significant result now that a four-year institute is the attendance level under analysis. Teachers being out-of-field are an insignificant concern with four-year institution attendance.

In the four-year attendance model, school characteristics are now more important. Geographic location is still not important, but urban setting is now a factor. Students from suburban or rural schools are less likely than students from urban schools to go to a four-year institution. At least part of this difference may be due to the availability of institutions in the area near the student since it is simply easier to transition to a location closer to the student's home and locations near institutions may have more information about educational opportunities.<sup>21</sup> Alternatively, the behavior may be a reaction to the level of education required for local employment opportunities. Past research has indicated that local education requirements tend to affect educational attainment.<sup>22</sup>

Counselor aid is now significant, and appears to make a student more likely to continue educational development. Classes judged by students to be challenging and interesting seem to have more influence in this model, with students who don't feel challenged or interested by classes or who refused to talk about classes being less likely to move on to a four-year institution than those who had

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<sup>21</sup> Richard Jones, Albert Kauffman, "Access to Comprehensive Higher Education in Texas," *Social Science Journal*, Vol. 31 (3), 1994.

<sup>22</sup> Patricia Rice, "The Impact of Local Labour Markets on Investment in Further Education: Evidence from the England and Wales Youth Cohort Studies," *Journal of Population Economics*, Vol. 12 (2), 1999.

positive feelings about the class. The presence of career planning still does not appear to have any effect despite the possibility of it aiding in decisions regarding future education. Strangely, having an academic database appears to have a negative influence on this decision despite the possibility of aiding students in some way. This effect could be from inefficient use of resources, but it is difficult to be certain from the information available.

Differentiation of classes continues to have an influence, with differentiated classes seemingly causing students to be more likely to participate at a four-year institution. However, the “other” category is now significant. This category’s influence suggests that there is a method more useful than having undifferentiated classes or differentiated but grouped classes. Unfortunately, the data collection process did not include information about what systems were in place at these “other” schools so it is difficult to tell if there is a different system that appears consistently throughout the records or if there are multiple alternative systems to consider. The differentiation results combined the “interesting and challenging” questions leads to the possibility that students will be more likely to continue in education if there is more freedom to choose what material is most relevant to their interests.

Facility conditions have impact in this model, but the results do not have a clear pattern. Students who say problems due to lack of space are “very little” are less likely to continue on to a four-year institute, similar to the two-year model. However, there are more significant responses with the students saying poor building conditions hinder learning conditions “a lot” or those saying a lack of supplies hinders learning “to some extent” are less likely to continue their education than other respondents. Additionally, students from schools that are considered to have clean environments are more likely to continue on to a four-year institution. It appears that the basic level of facility quality has an effect but beyond that level, effects are less consistent.

### *Model Results Comparison*

While some variables have consistent effects across both models, there are some for which effects vary depending on the kind of institution chosen. Table 4 has a summary of the effects for each model.

It appears that having a better socioeconomic background, higher level of math test scores, being female, or being in the Asian group makes a student more likely to attend a postsecondary institute in general while being from a multiracial group makes it less likely. Interestingly, results from the English tests only become significant in the four-year institution decision. Being an American-Indian seems to have no effect on the decision to attend a four-year institute but has a negative influence on the two-year decision.

The included teacher variables have very little influence on decisions. Rewarding teachers seems to have a negative influence on postsecondary attendance as a whole, though it may possibly be a poor choice of rewards. Having teachers evaluate each other only has a positive influence in the two-year model, implying that any decision benefits from the evaluation are lost on those who are only deciding between not attending and going to a four-year institution.

The urban setting variables location is more of a concern with attending a four-year institution than a two-year, with the rural and suburban students possibly lacking resources that would allow them to more easily attend the institution. It may even be the lack of relatively close four-year institution sites that are causing rural and suburban students to change their decisions. Counselors and their information only appear to be of use in the four-year institution decision. On the other hand, information from career plans appears to be less important with no positive effects.



Table 4: Comparing Results Across Models

Variable	Not attending vs 2-year	Not attending vs 4-year	Variable	Not attending vs 2-year	Not attending vs 4-year
Socioeconomic Status Composite	↑	↑	Academic Database Available	0	↓
Math Test Score	↑	↑	Courses are Interesting and Challenging ("Strongly Agree" excluded)		
English Test Score	0	↑	Agree	0	0
Female	↑	↑	Disagree	0	↓
Race (Caucasian Excluded)			Strongly Disagree	0	↓
Amer. Indian/Alaska Native	↓	0	<Missing>	↓	↓
Asian, Hawaii/Pac. Islander	↑	↑	Teach Students Differently (Undifferentiated classes excluded)		
Black or African American	0	0	Differentiated w/Pre-Requisites	↑	↑
Hispanic, No Race Specified	0	0	Differentiated w/Grouping	0	0
Hispanic, Race Specified	0	0	Other	0	↑
Multiple Race	↓	↓	<Missing>	0	0
Highest Degree of English Teacher	0	0	Poor Building Conditions Hinder Learning ("Not at all" excluded)		
Highest Degree of Math Teacher	0	0	Very Little	0	0
Out of Field Teachers	0	0	To Some Extent	0	0
Out of Field Teachers (Missing entries)	0	0	A lot	0	↓
Teachers Evaluate Teachers	↑	0	<Missing>	0	0
Teachers Evaluate Teachers (Missing entries)	0	0	Poor Heating, Air, Light, Hinder Learning ("Not at all" excluded)		
Good Teachers Receive Awards	↓	↓	Very Little	0	0
Teachers Receive Awards (Missing entries)	0	0	To Some Extent	0	0
Urbanicity (Urban area excluded)			A lot	0	0
Suburban	0	↓	<Missing>	0	0
Rural	0	↓	Lack of Space Hinders Learning ("Not at all" excluded)		
GeographicRegion (Northeast area excluded)			Very Little	↓	↓
Midwest	0	0	To Some Extent	0	0
South	0	0	A lot	0	0
West	0	0	<Missing>	0	0
Received College Info from Counselor	0	↑	Lack of Supplies Hinders Learning ("Not at all" excluded)		
Students Develop Career Plans ("None do" excluded)			Very Little	0	0
Yes, some do	0	0	To Some Extent	0	↓
Yes, all students do	0	0	A lot	0	0
<Missing>	0	0	<Missing>	0	0
			Facilities Appear Clean	0	↑

↑: Increases chance of attending the institution  
 ↓: Decreases chance of attending the institution  
 0: Has no effect

Source: Author's Analysis of Data from the Education Longitudinal Study of 2002, National Center for Education Statistics

Ensuring that classes are interesting or challenging appears to only be useful in influencing the four-year decision. If the hypothesis regarding the non-respondents is correct, then preventing a deep dislike of classrooms becomes useful in both kinds of decisions. Regardless, changing classes so that there is differentiation which only requires students to meet pre-requisites appears to be a way to improve interest in postsecondary education for either group. While facility conditions do not seem to matter for the two-year decision, the conditions appear to have a small degree of influence for the four-year, but specific effects can only be traced to meeting a minimum level of cleanliness.

As a whole, the four-year decision appears to be more complex with fewer variables influencing the two-year decision. Interestingly, there are no conflicting effects. Either variables have the same direction of influence in both models or the variable is significant in one but not the other. The implication is that changes are relatively safe in that affecting one characteristic to increase the probability of going to one kind of institution will most likely not decrease the probability of an individual's choice to attend the other kind of school.

### **Comparison between Attendants and Non-Attendants in the Lowest SES Quartile**

With socioeconomic status being an indicator of whether or not a student will continue to postsecondary education, characteristic differences within the socioeconomic group becomes an interesting measure in seeing what is different between those who continue to a postsecondary institute and those who do not continue. Since those in the lowest socioeconomic group have the lowest propensity to continue when all other factors are held constant, this section considers the differences between those in the lowest SES quartile who attended a postsecondary institute and those who did not attend. These differences were tested for significance using a t-test, and the results can be found in Table 5. Where possible, variables were treated as scales instead of categories. Results that can be placed on a scale imply higher levels for one group. For instance, a negative result for students rating a class as interesting and challenging would mean that non-attendants rated their classes as being more

interesting than attendants. A binary variable would imply percentage of students in a group so that a positive value for the urban region would mean that more attendants came from an urban area than non-attendants.

Table 5: T-test of Means Between Those in the Lowest SES Quartile Who Continue with Education and Those Who Do Not Continue

Variable	Two-year Attendance Model				Four-year Attendance Model			
	Observations	Mean Difference	Std. Error	P-Value	Observations	Mean Difference	Std. Error	P-Value
Highest Degree of English Teacher	1798	0.0063	0.0472	0.8942	1613	-0.0280	0.0518	0.5859
Highest Degree of Math Teacher	1841	0.0141	0.0466	0.7613	1659	-0.0139	0.0510	0.7852
Percent of Out of Field Teachers	1839	0.2729	0.7508	0.7162	1630	-1.3638	0.7602	0.0730
Teachers Evaluate Teachers	1936	0.0114	0.0153	0.4585	1734	0.0211	0.0170	0.1252
Good Teachers Given Awards	1944	0.0155	0.0231	0.5019	1742	-0.0495	0.0254	0.0514
Urban Region	2322	0.0084	0.0199	0.6715	2077	0.1104	0.2223	<0.0001
Suburban Region	2322	0.0172	0.0211	0.4133	2077	-0.0817	0.0229	0.0004
Rural Region	2322	-0.0257	0.0173	0.1368	2077	-0.0286	0.0190	0.1322
Interesting Challenging Classes	2195	-0.0980	0.0345	0.0045	1968	-0.1978	0.0373	<0.0001
Differentiated Classes w/Pre-Requisites	1944	-0.0048	0.0221	0.8284	1740	-0.0529	0.0245	0.0314
Differentiated Classes w/Grouping	1944	0.0138	0.0151	0.3590	1740	0.0283	0.0168	0.0927
Undifferentiated Classes	1944	-0.0068	0.0191	0.7235	1740	-0.0075	0.0210	0.7210
Other Arrangements of Classes	1944	-0.0023	0.0057	0.6888	1740	0.0321	0.0082	0.0010
Counselor Provided College Info	1591	0.0707	0.0243	0.0037	1442	0.1404	0.0259	<0.0001
No Students Develop Career Plans	1969	-0.0058	0.0166	0.7275	1757	0.0405	0.0190	0.0333
Some Students Develop Career Plans	1969	0.0348	0.0228	0.1268	1757	-0.0211	0.0250	0.4001
All Students Develop Career Plans	1969	-0.0291	0.0225	0.1971	1757	-0.0195	0.0249	0.4347
Academic Database is Available	2151	-0.0130	0.0208	0.5315	1902	-0.0262	0.0231	0.2580
Walls and Floors Appear Clean	2289	-0.0107	0.0185	0.5628	2043	0.0219	0.0200	0.2751
Hindered by Poor Building Condition	1839	-0.0269	0.0402	0.5034	1654	-0.0791	0.0428	0.0650
Hindered by Heating, Air, or Light Conditions	1829	0.0001	0.0405	0.9988	1645	-0.0253	0.0444	0.5684
Hindered by Lack of Space	1811	0.0076	0.0465	0.8696	1637	-0.0173	0.0503	0.7304
Hindered by Lack of Supplies	1830	-0.0105	0.0350	0.7644	1647	-0.0066	0.0379	0.8623

A variable highlighted in red is significant at the 0.05 level.

Values are calculated by taking the mean value of those who continued to a level of education and subtracting the mean of those who did not continue.

Source: Education Longitudinal Study of 2002, National Center for Education Statistics

There appears to be very few significant differences between those who did not attend any institute and those who attended a two-year institute. There were more attendants than non-attendants who consulted a counselor, which was expected. However, the attendants seemed to think classes were less interesting or challenging than the non-attendants which conflicts with the expectations of the logit estimations. The comparison between non-attendants and four-year institute attendants has the same counselor and class rating results. The urbanicity differences have signs that would be expected from the logit results, but the career planning and class arrangement estimates are slightly different with four-year institute attendants being more likely to be from schools where no one

plans for future careers or from schools that have differentiated classes with pre-requisites compared to non-attendants. While these results do not imply causality, they still provide some insight into differences within the group that is least likely to continue with education. In particular, non-attendants having higher ratings when judging a class to be interesting or challenging is interesting in the implication that some students at this level may find classes to be more interesting but do not go on to a postsecondary institute. However, it may also be possible for the “challenging” portion of the question to be a heavier weight for students in this group.

### **Recommendations to Improve Postsecondary Attendance**

With the results of the two models, there are suggestions that could lead to higher rates of post secondary enrollment. The lack of significance in the geographic regions allows for these suggestions to be applicable to a state like Kentucky, despite the sample coming from a national group.

- **Where possible, increase use of differentiated classes and allow students to pick from those classes as long as they meet pre-requisites.** The model results indicate an increase in postsecondary education attendance from simply using this method. Where classes are already differentiated, switching to the pre-requisites style of selection instead of grouping may allow for improvements and should only require changing how classes are scheduled. Schools with only undifferentiated classes will have more difficulties in switching to the new method. If possible, it could be worthwhile to have members of a school with differentiation temporarily aid any other school that would be able to make the switch. For schools that would have to create extra classes for differentiation, difficulties may arise in finding teachers to lead those classes. Even though the results for the level of education of teachers and out-of-field teachers suggest that there may be some flexibility for which classes an instructor may be able to lead, there may still not be enough instructors so differentiation may need to be prioritized to fields in which there are sufficient instructors or where students have had more difficulties.

• **Attempt to change the classroom structure to appeal to more students.** The models suggest that those unhappy with content in the classroom are less likely to continue in their education. While it would be extreme to change all class material based on the students' whims, encouraging instructors to gradually introduce different methods of instruction to see what captures a student's attention may lead to more students having an interest in continued education. If resources are available, creating a simple network for teachers to share effective techniques could aid in developing more methods effective in capturing a student's interest. Unfortunately, this change may be difficult to simultaneously implement with certain kinds of standards if the standards limit control over material or methods. Any set of standards that do successfully sets the level of difficulty or provides material interesting to students would most likely have a positive effect in this kind of outcome.

• **Place less emphasis on the instructor's level of degree.** If teachers are expected to have higher levels of education to work in schools, then it imposes additional barriers to entries due to the time and funds needed to attain a degree or training beyond the level of a bachelor's degree and reduces interest in the field. If this improved the quality of instruction then it would be justifiable, but the results here suggest that there is no difference from level of education. These findings are consistent with past research which discovered that, based on SAT data from 1972 to 1990, students in states requiring a master's degree for teacher certification had lower SAT scores than students in states without a master's requirement.<sup>23</sup> If an alternative measure could be used to estimate how talented a teacher would be as an instructor, then it would be preferable over a qualification that adds little to the end result.

• **Place less emphasis on students developing career plans.** Results suggest that there are no positive effects but the development still requires use of time and resources. These resources would be better

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<sup>23</sup> Berger and Toma, "Variation in State Education Policies and Effects on Student Performance," *Journal of Policy Analysis & Management*, Vol. 13 (3), 1994.

used in another field that is known to improve student outcomes. Having counselors more active in discussing post-high school plans with any students that show a possible interest in postsecondary education may be more effective. Alternatively, it is possible that having all students create career plans has no effect because it becomes a rote exercise to which students pay little attention and may distract them from any useful planning. In schools where this attitude is prevalent, changing career planning to be optional could be a better course of action in that it would aid those who still may need the service but would not have as much of an effect on the student population as a whole.

•**Be more active in ensuring that schools maintain a minimum level of facility quality.** While influences from other aspects of facility quality are unclear, having a clean school seems to improve the students' views of education. This consideration is relatively easy to measure, and should not require an extensive set of skills to maintain. The lack of clear results may also come from schools having different kinds of families attached to schools. Students belonging to families from high socioeconomic status groups may be more likely to protest the quality of the school and its services, so the effect may be diluted in areas where those families are common and the facility quality may only be influential where there are more individuals in the lower socioeconomic status levels. If so, then these efforts may need to be focused on areas that have traditionally been associated with students from low socioeconomic status backgrounds.

•**Encourage four-year institutions to be more active in rural or suburban areas.** The extended campus arrangements used by institutions, where classes are provided in locations outside of the institution's city, serves as a stronger version of what is recommended here so there may need to be more attention given to how well these perform and interact with the community to see if it is helping to counter the negative influences from living in other urban settings. The extended campus courses could also be useful if the effect is simply due to increased costs associated with travel and finding a new place of residence near the campus. However, it is difficult to recommend simply creating more of these arrangements unless the results are confirmed by another study.

- **Provide additional or alternative benefits to students from a low socioeconomic background.**

Admittedly, there is already support for these kinds of students but it still seems they have more difficulties compared to those in higher status groups. If the current benefits that directly provide funding are not effective as hoped, then more information may be needed to determine what exactly is restraining these students. If a survey could be constructed to see what is holding back qualified but less fortunate students from continuing while avoiding the topic of pure monetary concerns, then a sort of transition benefit or program could be made to prevent those from a lower socioeconomic group from having more troubles than others. Benefits may also be gained by increasing the scope of programs such as GEAR UP. The analysis of differences between attendants and non-attendants in the lowest socioeconomic status quartile implies that class material and structure changes may not be as effective at the lower levels, but other influences may still be effective in influencing behavior at this level. It is likely that additional research may need to be conducted to see if these programs are effective or if they need to be tweaked to fit the conditions of students from these backgrounds. Students from this background that also come from suburban schools may also need additional help since they seem to be less likely to continue on to a four-year institute than other students.

### **Limitations of the Study**

Possibly the most significant limitation of this study is that it is unable to directly estimate what influences a person to choose between a two-year institution and a four-year institution. Theoretically, the study should have been able to indirectly measure this decision by looking at what had different signs between the models, but no opposing signs occurred. At best, the results are able to suggest variables that affect decisions pertaining to each path but not decisions between paths. If the primary influence on the decision of level of institute to attend is something like the state of the economy, then that is outside the realm of student or school characteristics and these models will never be able to fully

capture what is involved. Yet, at that point, the influences will generally be outside of public influence and would be difficult to influence.

The other major limitation of the study is that it may not be properly estimating characteristics associated with students from the lowest socioeconomic backgrounds. Many students were lost from the survey between the follow-up during high school and the follow-up two years after graduating. While it is not surprising to lose track of participants over the years, it appears that most of the people lost were from the lower socio-economic backgrounds. The original sample divided the group of students into quartiles based on their status, and a simple tabulation of the group on which data is available shows the equal quartiles were not maintained, as can be seen in Table 4. The first, second, and third quartiles each make up less than a quarter of the sample apiece while the fourth quartile filled almost thirty percent of the sample. If those in higher socioeconomic quartiles are more likely to continue their education, then this implies the model may have been biased towards overemphasizing that individuals will continue to one of the education institutions. Unfortunately, this is a problem that is difficult to control. Maintaining contact and information with an individual over multiple years can be difficult and those from a background with fewer resources may have more trouble with maintaining the quality of their lives while trying to keep in touch with researchers who will barely affect their lives.

Table 6: Showing Underrepresentation of Lower Socioeconomic Status

Socioeconomic Quartiles	Frequency	Percent
Quartile 1 (Low)	3,017	22.700
Quartile 2	3,073	23.120
Quartile 3	3,290	24.750
Quartile 4(High)	3,911	29.430
Total	13,291	100.000

Source: Education Longitudinal Study 2002, National Center for Education Statistics



## Concluding Remarks

The intent of this study was to determine which characteristics from a group of student, teacher, and school characteristics had a significant influence in affecting postsecondary enrollment. There are social benefits from having a more educated populace, the Kentucky political system has highlighted intentions to increase enrollment in institutions, and Kentucky has lagged behind the nation and most states in its ability to continue educating the populace beyond high school. Most of the previous efforts to examine postsecondary attendance decisions have focused on the demographics of students with the implication that those student characteristics are the major influence on postsecondary attendance decisions. This research has attempted to go beyond that assumption and consider additional characteristics of teachers and schools, since those attributes can be influenced by the state government, and the majority of students will experience attributes of those two groups. Two different logit models indicated that the attendance decision was heavily influenced by student characteristics but also had connections with school and teacher attributes. In both of the models, socioeconomic status and ability (measured via test results) appeared to be strong influences, with those from higher socioeconomic status levels and those achieving higher test results being more likely to continue with education. The decision to attend a two-year institution appeared to be less influenced by non-student characteristics with only teacher evaluations, and class differentiation having distinct positive results, with teacher rewards having a negative result -- which was most likely due to allowing teachers to choose their own students or classes. The four-year decision appeared to be more complex with influences from location, the student's view of classes, counselor consultation, and some degree of facility quality influencing the decision. Recommendations based on the analysis include changing classes to involve differentiation, providing additional postsecondary information to students in high school making attendance decisions, attempting to maintain a minimum level of facility condition, and targeting able students from lower socioeconomic settings. Unfortunately, the analysis was unable to

determine what causes a student to be set on a specific decision path and can only provide suggestions to encourage more students to attend a postsecondary institute.

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