Policy Brief

Improving Community College Outcome Measures Using Florida Longitudinal Schooling and Earnings Data

Louis Jacobson, Ph.D.

March 28, 2011

This brief discusses how combining traditional performance measures: credits completed and credentials earned with new measure of the effect on post-secondary earnings of credits, field of study, and credentials leads to a fresh perspective about: (1) how community colleges can best meet the goals of its students; and (2) the strengths and weaknesses of current programs. It also shows how community college's contribution to students' success can be compared more accurately across colleges by adjusting for differences in the characteristics students bring with them upon entering college. State and college officials can use the new measures to improve student outcomes and monitor progress in meeting students' goals. Students can use the measures to select programs that best meet their needs and counselors can use them to provide better advice to students.

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Using Florida Longitudinal Schooling and Earnings Data
Dr. Louis Jacobson   President, New Horizons Economic Research   18 March 2011

EXECUTIVE SUMMARY

This brief discusses how combining traditional performance measures: credits completed and credentials earned with new measure of the effect on post-secondary earnings of credits, field of study, and credentials leads to a fresh perspective about: (1) how community colleges can best meet the goals of its students; and (2) the strengths and weaknesses of current programs.

It also shows how community college's contribution to students' success can be compared more accurately across colleges by adjusting for differences in the characteristics students bring with them upon entering college. State and college officials can use the new measures to improve student outcomes and monitor progress in meeting students' goals. Students can use the measures to select programs that best meet their needs and counselors can use them to provide better advice to students.

Over half of all students who attend community college do so to gain access to better jobs and higher earnings, but outcome measures currently in use do not distinguish the earnings-enhancing effects of different education outcomes. In particular, those measures do not recognize that three specific outcomes generate especially high financial returns: (a) obtaining four-year degrees after obtaining two-year degrees; (b) obtaining two-year degrees with fields of study generating moderate or high returns; and (c) obtaining career-oriented certificates. I call these the "Top-3" outcomes.

The study breaks down earnings-enhancing effects to reveal the financial returns associated with different education outcomes to show that **students dramatically increase their earnings by completing more credits in higher-return concentrations, without increasing their total number of credits or completing credits that are more challenging academically**. More specifically:

- Students who leave college with a certificate earn over $8,000 per year more on average than students who complete about the same number of credits but leave college without credentials.

- Students who leave college after obtaining two-year degrees in moderate- and high- return concentrations earn about $12,000 per year more on average than students leaving college with two-year degrees in low-return concentrations.

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These differences in financial returns are so large that state and college officials should consider using this information to set goals that would lead more career-oriented students to obtain much higher-paying jobs after leaving college.[*]

Moreover, because students need not stay in college longer nor complete credits that are more challenging academically to realize large earnings gains, **substantial shifts toward choices that lead to much higher earnings might be realized simply by helping students consider the full range of options open to them and the consequences of their decisions**.   Currently:

- Colleges typically do not provide information about options and future earnings to entering students or students who change plans while in college.
- Many students lack accurate information about college fields of study and the effect of field on subsequent earnings.

Providing better information is especially important for low-income students who are the first members of their families to attend college as well as students who did not do particularly well academically in high school. This is because these two groups are most unlikely to realize that there are high-return outcomes attainable by virtually every student regardless of family income or high school GPA.

The analysis also describes the dramatic variation *across* Florida's community colleges in the percentage of students who leave college with high- versus low- return outcomes. Most notably, the percentage of students at a given college who:

- Leave school with fewer than 25 credits ranges from 26.8 percent to 50.8 percent.
- Obtain certificates ranges from 0.1 percent to 27.5 percent.
- Obtain two- and four-year degrees ranges from 6.6 percent to 22.5 percent.

Because very large earnings differences are associated with each of the above outcomes, cross-college differences in earnings-enhancing effects are also very large.

The study further finds that:

- Students are much more likely to have higher-return outcomes if they graduated from high school with A/B+ grade point averages (GPAs) or came from rural high schools.
- There are large cross-college differences in the percentage of students with A/B+ GPAs and in the percentage of students coming from rural high schools.

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[*] These earnings effects are estimated using schooling and wage record data covering 35,000 students who entered the 9th grade in 1996, attended Florida community colleges between 2000 and 2007, and had some earnings after leaving college. The details of this analysis are presented in my longer study by the same name.

As a result, adjusting for the large cross-college differences in the percentages of student with A/B+ GPAs and coming from rural high schools substantially alters the ranking of community colleges with respect to how much difference an individual college makes in the percentage of its students who leave college in the three outcome groups with the highest earnings.

Several key practical conclusions stem from the above finding.

- Policymakers can *only* make meaningful cross-college comparisons by taking into account differences in student characteristics.
- Researchers can better identify factors that lead some colleges to have high proportions of students in the Top-3 outcome groups by using adjusted cross-college comparisons.
- Administrators can pinpoint how well their colleges are performing relative to their peers, set obtainable goals for increasing the proportion of students with high-return concentrations, and monitor progress in meeting goals by using the adjusted comparisons.
- Students can make better informed choices and better attain their goals by using information about the relationship among factors such as A/B+ high school GPAs, concentrations, credentials, and earnings.

Perhaps most importantly, having accurate measures of the college's contribution to meeting students' goals is essential if state and college officials want to create incentives that substantially increase college's contributions to students' rates of success. Having accurate measures are indispensable to creating incentives by:

- Giving recognition to colleges, academic departments, and student-support organizations that substantially increase the extent to which students achieve their goals.
- Allocating resources to expand programs and services that contribute to improving student outcomes, such as by awarding cash bonuses to colleges for each student obtaining a certificate, a two-year degree in a moderate- or high-return concentration, or a four-year degree after obtaining a two-year degree.

This analysis hopes to stimulate state and individual college policy-makers to take actions that improve outcomes from students' points of view, as well as to encourage policy-makers to use accurate, comprehensive information to monitor progress in reaching goals and to create incentives to improve outcomes. Having more precise information about what expenditures are most effective in helping students meet their goals is especially relevant in a period where resources are decreasing and critically important decisions must be made about how best to allocate whatever resources are available.

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Policy Brief

IMPROVING COMMUNITY COLLEGE OUTCOME MEASURES
USING FLORIDA LONGITUDINAL SCHOOLING AND EARNINGS DATA

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INTRODUCTION

This policy brief presents the central findings of practical value from my much longer and more detailed research report, *Improving Community College Outcome Measures Using Florida Longitudinal Schooling and Earnings Data.*

The first part of this brief describes new performance measures that combine the traditional measures — credits completed and credentials earned —with the new measure: effects on earnings. It then discusses how this new combination of measures leads to a pragmatic and realistic perspective about: (1) how community colleges can best meet the goals of its students; and (2) the strengths and weaknesses of current programs. Finally, it assesses the potential for the measures to greatly increase the likelihood of students' achieving their individual goals, given that more than half of community college students' attend college in order to enhance their careers.

The second part examines the need to take into account the characteristics students bring with them when entering college. This adjustment is necessary to: (1) accurately assess a college's contribution to meeting students' goals; (2) create incentives that foster improvement by rewarding excellence; and (3) identify best practices. This part investigates how characteristics students bring with them upon college entry, such as their high school grade point average, affect outcomes that substantially raise earnings, and how these characteristics vary across Florida's community colleges. It then examines how to adjust for these differences in student attributes in order to provide meaningful comparisons.

PART I: THE RELATIONSHIP BETWEEN EARNINGS AND POSTSECONDARY EDUCATION OUTCOMES

One central finding in the full report is that combining traditional and new community college outcome measures leads to a fresh perspective on what education outcomes are most desirable from the point of view of students. The traditional outcome measures are credentials obtained and credits completed. The new measure is the effect of credits, credentials, and field of study (concentration) on post-college earnings.

As shown in Figure 1, three outcomes are associated with especially high post-college earnings, defined here as median annual earnings ranging from $34,000 to $36,100. These outcomes, which I call the "Top-3," are:

- Obtaining four-year degrees after obtaining two-year degrees
- Obtaining two-year degrees with high-or moderate-return concentrations[2], but not obtaining four-year degrees.
- Receiving career-oriented certificates.[3]

Three other outcomes are associated with post-college earnings at least $8,700 lower than the Top-3, either because credentials are not obtained, or the credentials are obtained in low–return concentrations. The median annual earnings of these outcomes range from $22,100 to $25,300.   I will refer to these outcomes as the "Bottom-3":

- Obtaining two-year degrees with low-return concentrations, and not obtaining four-year degrees.
- Leaving college with no credential after completing at least 24 credits — a year's worth.
- Leaving college with no credential after completing fewer than 24 credits.

Figure 1. Median Earnings by Education Outcome
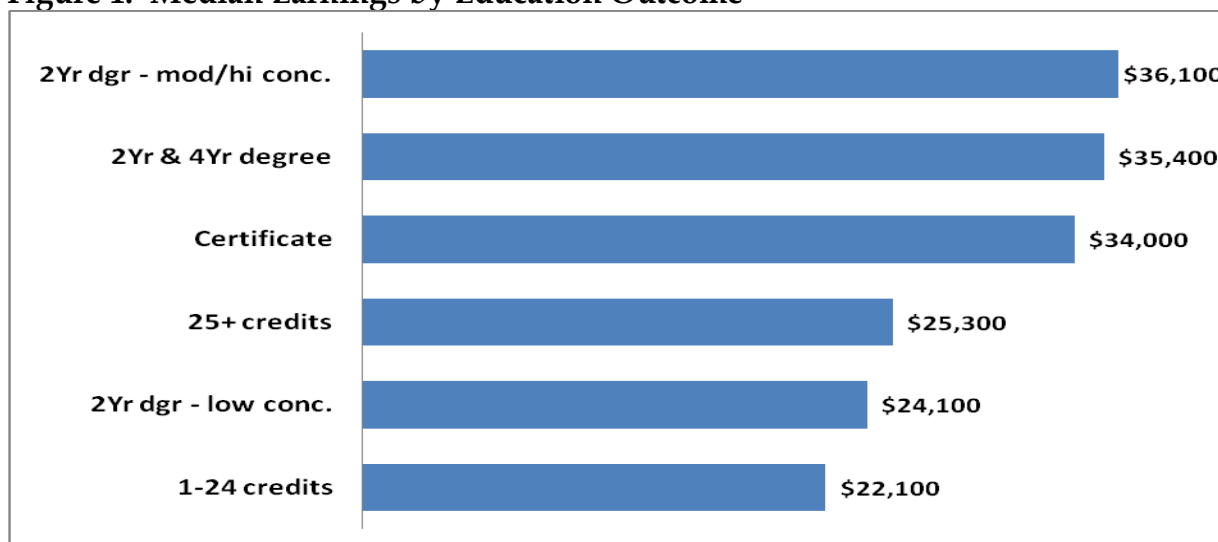
Source: These statistics, and all other statistics in this brief, are the author's calculations using the student database provided by the Florida Department of Education covering all students who entered the 9th grade in 1996 and attended Florida community colleges from 2000 to 2007.

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[2] See Appendix A for a description of the low, moderate, and high return concentrations and an explanation for why additional groups were not broken out by concentration.
[3] The certificates examined in this study generally required completing a year's worth of credits. Community colleges also offer much shorter-term certificate programs, but those we excluded from this analysis.

The median earnings displayed in Figure 1 are derived by analyzing the wage records from the Florida Department of Education's outstanding data warehouse covering 35,000 students who were first-time 9th graders in Florida public schools in 1996, attended Florida public community colleges between 2000 and 2007, were not also enrolled in high school or four-year colleges during the bulk of their community college stays, and had at least some earnings after leaving college.

While the most striking result in Figure 1 is the very large difference in median earnings between the Top-3 and Bottom-3 outcome groups, an equally important result is that **students reaching higher education levels did not necessarily have higher earnings than students reaching lower levels**. Most notably, students with two-year degrees in low-return concentrations had earnings that were $10,000 less than students with certificates and $1,200 less than students with 25 or more credits and no credential. Similarly, students with two-year and four-year degrees had earnings that were $700 less than students with two-year degrees in moderate- or high-concentrations. This small difference arises from students with two-year degrees in health-related fields, particularly registered nursing, having earnings that average $7,000 per year more than the earnings of students with both two- and four-year degrees with science, technology, engineering, and math (STEM) concentrations—the highest-return concentrations for students with two-year degrees who went on to obtain four-year degrees.

That reaching higher levels of education does not guarantee higher levels of earnings is crucial evidence that **the new earnings-related measures presented here provide a more nuanced look at the extent to which students achieve their individual goals**.

The Relationship Between A/B+ High School Grade Point Averages and Education Outcomes

A second central finding in the longer report is that **students might be able to dramatically increase their earnings by substituting moderate- or high- return credits for low-return ones—without completing more credits overall or more academically challenging credits**.

In this section we examine whether there is a need to complete more challenging credits in order to attain the Top-3 outcomes by using the percentage of students with A/B+ high school GPAs in each outcome group as the index of academic "challenge"—the level of academic skill needed to end up in a given group.[4] We posit that the higher the

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[4] We use the percentage of A/B+ students rather than average GPA as the index of challenge because students with high GPAs have not only acquired the academic skills needed to get high grades, but they also worked hard to complete their assignments. Thus, they are especially likely to possess the hard and soft skills needed to succeed in college.

A/B+ percentage for a given outcome group, the more demanding the academic challenge. Thus, if a higher return group also has a higher percentage of A/B+ students than a lower return group, the harder it will be for students to successfully shift from the lower-return to the higher-return group. But the reverse also is true. If the percentage of A/B+ students in a higher-return group is about the same or less than the percentage in a lower-return group the easier it will be to successfully make the shift.

Figure 2 shows that the percentage of students with A/B+ GPAs was 85 percent for students with degrees, but only 43 percent for students without degrees -- a 42–point difference. This finding suggests that major academic impediments might prevent many students who leave college without credentials from obtaining degrees

Among students with degrees, the percentage with A/B+ GPAs was: (a) about 10 percentage points higher for students who obtained two-year and four-year degrees than those who obtained two-year degrees with moderate- or high-return concentrations, and (b) about 12 points higher for students who obtained two-year degrees with moderate- or high-return concentrations than those who obtained two-year degrees with low-return concentrations. These findings suggest that: (a) academic impediments prevent relatively few students with two-year degrees in low-return concentrations from leaving college with two-year degrees in moderate- or high- return concentrations; but (b) academic impediments prevent substantially more students with low-return two-year degrees from completing four-year degrees.

Figure 2. Percent of Students with A/B+ High School-GPAs by Education Outcome
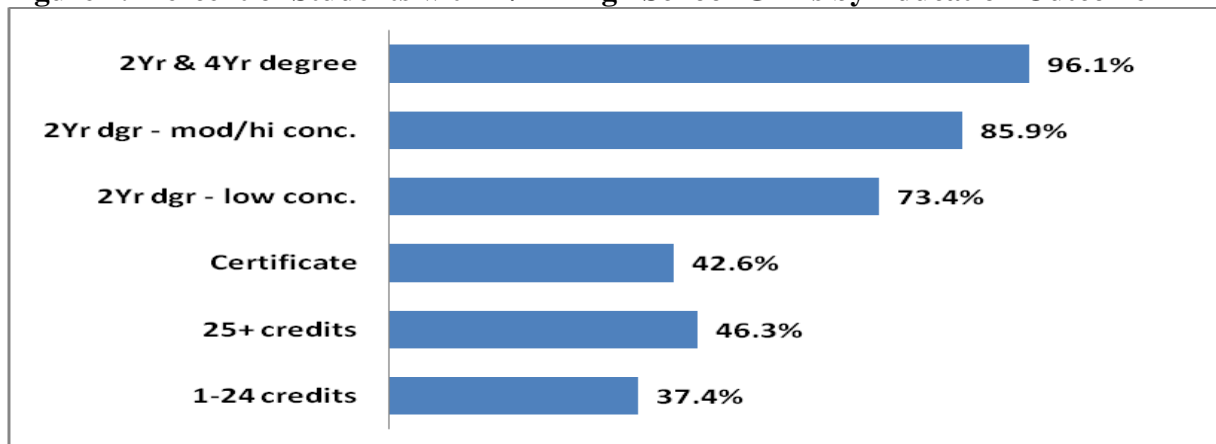
Among students without degrees, the percentage of students with A/B+ GPAs was about: (a) 3 points *lower* for students with certificates than for students with 25+ credits but no credential, but (b) 9 points *higher* for students with 25+ credits and no certificates than for students with 1–24 credits. These results suggest that no major academic impediments prevent students with 1-24 or 25+ credits from leaving college with certificates.

The Relationship Between Education Outcome and Credits Completed

In this section we examine whether there is a need to complete more credits in order to boosts future earnings by examining the number of credits students completed in each of the six outcome groups. We posit that the more credits students complete in a given outcome group, the more difficult it will be for students to enter that group. Thus, if students in a higher return group have more credits than students in a lower return group, the harder it will be to successfully shift from the lower- to the higher- return group. But the reverse also is true. If the number of credits students complete in a higher-return group is about the same or less than the number students in a lower-return group the easier it will be to successfully make the shift.

Put another way, a variety of impediments prevents some students from completing more credits. It may not be feasible for them to obtain more credits, but it should be feasible for them to alter the mix of credits so they end up with concentrations and credentials that lead to substantially higher earnings, without altering the total number of credits obtained.

Figure 3. Community College (CC) and Four-Year College (4YC) Credits per Student by Education Outcome
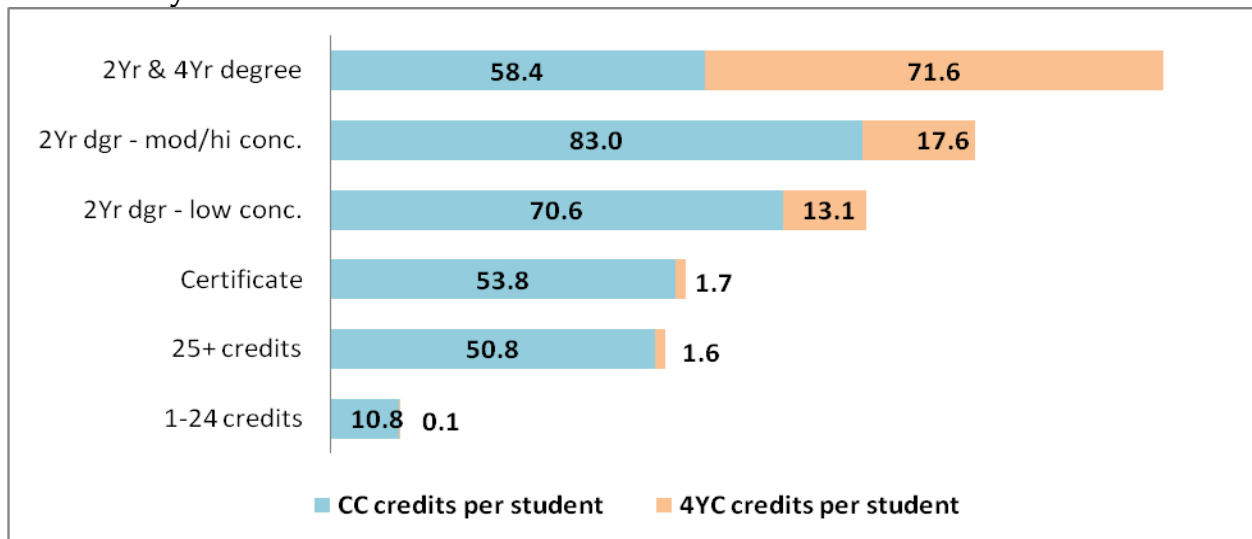
The two most important results in Figure 3 are that: (a) students with certificates completed about the same number of credits as students with 25+ credits and no credential; and (b) students with two-year degrees in moderate- and high- return concentrations completed only slightly more credits than students with two-year degrees in low-return concentrations. In both of these cases, students who completed only a few more credits ended up with much higher earnings suggesting that these movements from the lower to higher return could be easily accomplished.

In distinct contrast, students with certificates completed about five times more credits than students with 1-24 credits. This suggests that it would be difficult for the 1-24 students to reach any of the Top-3 outcome groups.

Figure 3 also indicates that there are large differences in credits completed between students with no degree and those with a two-year degree and between those with a two-year degree and a four-year degree. These findings suggest that while all students, except those with 1-24 credits, have high-return options open to them that do not require completing more credits, it would be difficult to go from no degree to a two-year degree and go from a two-year degree to a four-year degree.

Further evidence suggesting that the two-year to four-year degree transition is particularly difficult to accomplish comes from few students leaving college with two-year degrees completing many four-year college credits, while students who go on to obtain four-year degrees complete slightly more *community college credits* than students with 25+ credits, and then complete the bulk of their credits at four-year colleges.

Taken together, the above results and those in the preceding section indicate that **two groups of students could substantially increase their earnings via changes in outcomes that are highly achievable because they require no major increase in the number of credits completed nor completing credits that are more academically challenging**. One group is students leaving college with 25+ credits who could instead obtain certificates. The second group is students leaving college with two-year degrees in low-return concentrations who could switch to moderate- or high-return concentrations.

While there are other outcome changes that would raise the earnings of members of these two groups, and of students with 1-24 credits, **all of them require completing more credits, and more academically challenging credits**.

POLICY IMPLICATION I —IDENTIFYING WAYS TO INCREASE EARNINGS THAT DO NOT REQUIRE COMPLETING MORE CREDITS OR MORE ACADEMICALLY CHALLENGING CREDITS[5]

The above findings demonstrate that major differences in earnings are associated with the number of credits completed and the number of credits completed in different concentrations. In particular, the results show that three outcomes generate especially

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[5] The primary policy implications of this brief relate to reducing the number of students who leave school without completing many credits in total, or many higher-return credits; and increasing the number of students who complete a substantial number of higher-return credits. There are many reasons why students should progress as far as they can through college that are unrelated to earnings effects. Thus, while the difference in earnings between the Top-3 and Bottom-3 outcomes are very large and should be considered by administrators in setting goals and by students in selecting programs of study. I do not want to give the impression students capable of obtaining two- and four- year degrees should be discouraged from doing so because earnings gains are likely to be small.

high post-college earnings: <u>obtaining a four-year degree after obtaining a two-year degree; obtaining a two-year degree in a moderate- or high-concentration; and obtaining a certificate</u>.

Comparing these Top-3 outcomes to other outcomes reveals two striking results:

1. Students with certificates in career-enhancing concentrations earn $8,000 more per year, on average, than those with at least one year's worth of credits who do not obtain credentials.
2. Among students with two-year degrees, those with moderate- and high-return concentrations earn $12,000 more per year, on average, than students with low-return concentrations.

Just as important, however, students with certificates have almost equal proportions of A/B+ high school GPAs and complete the same number of credits in total as students with 25+ credits and no credential; and students with two-year degrees in moderate- or high-return concentrations have only slightly higher proportions of A/B+ high school GPAs and complete slightly more credits than students with two-year degrees in low-return concentrations. **These results strongly suggest that it would be highly feasible for students in two of the Bottom-3 outcome groups to substantially increase their earnings by changing the mix of credits completed to end up with certificates or two-year degrees with moderate- or high-return concentrations.**

The financial differences are so large, and evidence is sufficiently strong, that at the very least policymakers should ascertain if students would make different choices if they had better information about their options and the consequences of their choices. The simplest way to do this would be to **examine the extent to which students who receive high-quality career counseling end up with higher-return outcomes**. This is a particularly attractive option because the cost of counseling is low and counseling is most unlikely to have negative effects.

An alternative would be to conduct surveys assessing the extent to which students simply do not know what options are available to them or the economic consequences of their choices. If this is the case, it also would point to improving career counseling as means to help students make better-informed choices (but not demonstrate the effectiveness of the counseling).

Surveys could also indicate the extent to which manual dexterity, good "people" skills, inquisitiveness, and other non-academic skills contribute to obtaining career-oriented certificates and degrees in high-return fields such as healthcare and building trades. To the extent this is the case, improved assessment to identify what skills students possess would help them make sounder choices. Finally, surveys could indicate the extent to which students prefer entering lower-paying occupations or attend college for reasons

unrelated to career enhancement. The results could be used to apply earnings-related measures only to students indicating that career-enhancement is an important goal.

POLICY IMPLICATION II – SETTING PRIORITIES TO GREATLY INCREASE THE RETURNS ON COMMUNITY COLLEGE INVESTMENTS

This section examines the economic returns from community college investments in students with different outcomes.   Figure 1 illustrates the monetary return from different education outcomes. Figure 4 illustrates the magnitude of community college investments in different outcomes.

The blue bars in Figure 4 represent the distribution of total credits earned at community colleges across the outcome groups; the distribution of credits indicates the percentage of resources absorbed by each group. The greater the proportion of credits, the greater the investment. The red bars represent the distribution of total students across the outcome groups. The greater the proportion of students in the high-return outcome groups, the greater the return on investment.

Figure 4. Distribution of Students and Credits by Education Outcome in Community Colleges
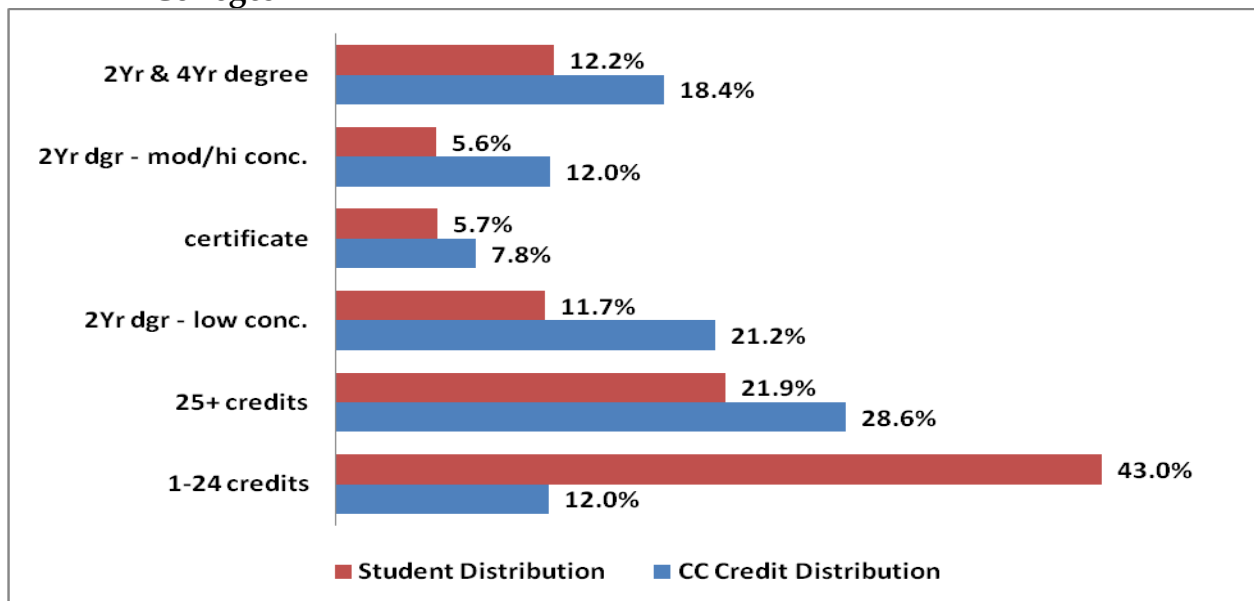
The most important finding shown in Figure 4 is that students with two-year degrees with low-return concentrations and students with 25+ credits but no credential constitute 34 percent of all students and just under 50 percent of all credits, a major proportion of colleges' resources. Because the economic returns for these two groups of students are low, while investment of resources in them is high, a key issue to consider is what community colleges can do so that more of these students accrue higher earnings.

The return on investment is notably higher for students in the Top-3 groups, who constitute 24 percent of the students and 38 percent of the total credits. Because the labor market returns accruing to these students are very high, the community college investment in them represents funds well spent and greatly benefits students (and local employers that depend on a well-trained workforce). It, therefore, would be highly rewarding for all community college stakeholders (the students, the colleges, the local employers, the state and local policymakers) to help more students enter one of the Top-3 groups. For students with A/B+ GPAs completing 50+ credits, such as most of those with two-year degrees in low-return concentrations, the most feasible route would be to alter their mix of credits to end up with moderate- or high- return concentrations. For students with below B+ GPAs completing 25+ credits, the most feasible route would be to obtain certificates.

Finally, students completing 1-24 credits constitute 43 percent of all students but only 12 percent of all credits. In this case, the returns are low, but so are the investments. Thus, shifting more students from the 1-24 credit group to the Top-3 outcomes groups, while desirable, is not nearly as important to raising net returns as helping students who complete 25+ credits or obtain two-year degrees in low-return concentrations enter the Top-3 outcome groups. Moreover, it may be difficult to help students with 1-24 credits even to obtain certificates—the Top-3 outcome requiring the fewest completed courses and the lowest level of academic preparation—because many 1-24 credit students face an array of impediments that prevent them from remaining in college, and many struggle academically.

Nevertheless, many students who graduate far from the top of their high school class go on to prosper at community colleges. Thus, it is possible that the high returns from those students more than counterbalance the low returns for the many with poor high school performance who do not progress very far. Moreover, if students who end up in the 1-24 credit group were given improved career assessment and counseling, many might find pathways that they were unaware of where they can excel and gain the motivation needed to stay in college long enough to obtain earnings-enhancing training.

PART II: USING THE NEW MEASURES TO SET GOALS, CREATE INCENTIVES TO MEET THOSE GOALS, AND MONITOR PROGRESS IN MEETING THOSE GOALS

Because the new measures described here provide a fresh perspective on pathways that better meet students' career-enhancement and academic goals, policymakers should at least consider using them to set goals, create incentives, and monitor progress toward meeting goals.

High-quality outcome measures offer clear indicators of the contribution they make to students success. Such measures can be key tools for encouraging colleges to improve their ability to meet students' needs. They also ensure that the institutions' goals are attainable and reflect widely agreed-upon missions. However, creating high-quality outcome measures requires accounting for the influence of outside factors in order to give colleges credit for what they do, and to make appropriate comparisons across institutions, across instructional and support departments within an institution, and over time. How this can be done is the focus of the next part of the brief.

The Distribution of Outcomes Across Florida's Community Colleges

This section examines how much cross-college variation there is in the proportion of students in the Top-3 outcome groups. The following section examines how much of that variation is associated with differences in the attributes students bring with them upon enrollment in college. Adjusting for student characteristics is necessary to identify how much of the observed differences in outcomes are related to the contribution college's make to helping its students—which is the performance measure that should be used for assessing cross-college performance.

For example, if community college A is located in an area where most enrollees have A/B+ high school GPAs, college A would be expected to have many more students obtain two-year and four-year degrees than college B, located in an area where most enrollees have B-or-below high school GPAs. Thus, actual differences in performance between these two hypothetical colleges tell us very little about the contribution each college makes to help its students. To make that determination it is necessary to adjusts actual performance to reflect what it would be if both college had students with close to identical characteristics.

The length of the bars in Figure 5 shows the range for the percentage of students in each outcome group across 27 of the 28 Florida community colleges. (The enrollment of one college was too small to provide meaningful results.) The key result is that the Top-3 percentage ranges from 15.1 percent to 44.5 percent—a difference of 29.4 percentage points. This means that different community colleges graduate very different percentages of students with high-return outcomes.

The primary source of this Top-3 variation is the percentage of students with certificates, which ranges from 0.1 percent to 27.5 percent—a difference of 27.4 points, an exceptionally large range. The secondary source is the percentage of students with two-year and four-year degrees, which ranges from 6.6 percent to 22.5 percent—a difference of 15.9 points.

At each college, the sum of the percentages across the six groups is 100 percent. Thus colleges with high percentages in the Top-3 groups necessarily have low percentages in

the Bottom-3 groups. Figure 5 suggests that colleges with high Top-3 percentages tend to have low percentages of students who leave college with 1-24 credits; the range for this group is 26.8 percent to 50.8 percent—a difference of 24.0 points. Colleges with high Top-3 percentages also have low 25+ credit percentages; the range for this group is 16.0 percent to 30.9 percent—a difference of 14.3 points.

Figure 5. Cross-College Range of Percentages of Students Reaching Each Outcome for 27 Community Colleges
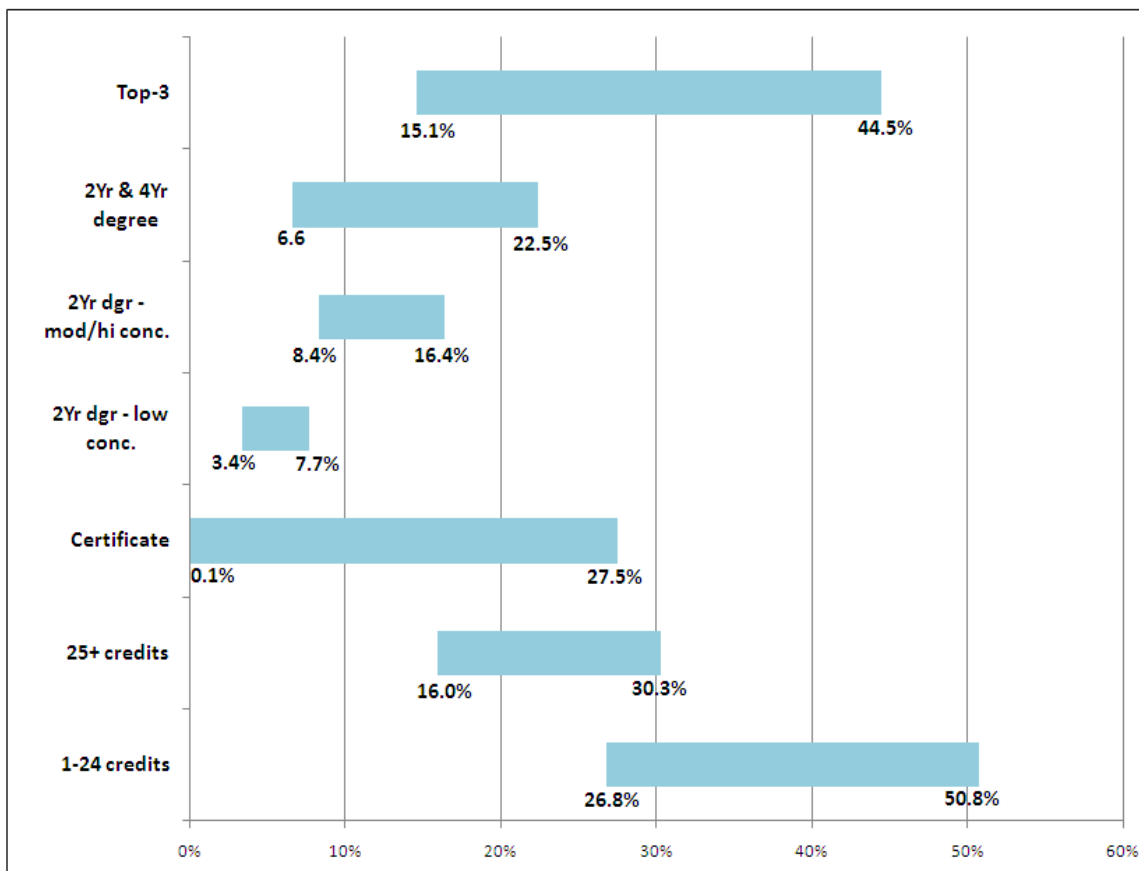
The largest variation among colleges is for the certificate and 1-24 credit outcome groups. Further analysis indicates that colleges with high certificate percentages had low 1-24 credit group percentages and vice versa. If this result was due to differences in what the colleges did once the students arrive, it would reinforce the view that one of the most feasible changes is for more students to get certificates rather than leave college with no credential. But we cannot know what role the colleges played in producing this result until we determine to what extent the above result was due to differences in the characteristics students brought with them on entering college—the topic of the next section.

<u>Adjusting the Outcome Distributions to Account for Cross-College Student Differences</u>

As previously noted, we cannot identify how much difference colleges make in helping students achieve high-return outcomes by comparing the unadjusted percentages of Top-3 students. For example, a college with a low Top-3 percentage and a low percentage of A/B+ students may be providing far more help to its students in reaching Top-3 groups than a college with a high Top-3 percentage and a high percentage of A/B+ students.

The study tested over 30 characteristics that students bring with them to college for their ability to explain cross-college variation in Top-3 percentages. (See Section 8 of the long report for the variables and tests conducted.)

Two-thirds of the Top-3 variation was explained by:

- The percentage of students with A/B+ high school grade point averages (GPAs).
- The percentage of students attending high school in rural areas (Rural).

This exceptionally large amount of explanatory power stems from both variables having very large differences across the 27 colleges as well as being very strongly correlated with differences in the Top-3 percentages.

Colleges with a high proportion of A/B+ students would be expected to have high Top-3 percentages, because students with A/B+ GPAs are likely to have the academic skills required to obtain two-year and four-year degrees. However, it is not at all clear why colleges with many students from rural high schools would have high Top-3 percentages. One possibility is that rural students are especially likely to want to obtain certificates, but the precise reason this appears to be the case merits further investigation.

It also is noteworthy that after controlling for GPA, the Top-3 percentage tended to be high when the percent of low-income students was high, although this result was not statistically significant when Rural was also taken into account. Most likely this result stems from low-income students wanting to save money by completing their first two postsecondary years at low cost, before obtaining bachelor's degrees at institutions where tuition is substantially higher and where it may be necessary to relocate and pay for room and board.

To develop measures that better reflect how much colleges do with their students after they arrive is responsible for differences in attaining the Top-3 outcomes, I adjusted the actual Top-3 percentages to reflect what they would be if each college had the same percentage of students with A/ B+ GPAs and the same percentage coming from rural schools. A three step process was used. First, a regression was run to estimate how

much the Top-3 percentage would change for each one percentage point change in A/B+ and rural students. Second, these estimates were multiplied by a given college's number of A/B+ and rural students' percentage points above or below the average across all 27 colleges. Third, the resulting products were *added to* the actual Top-3 percentage if the percentages were below average or *subtracted from* the actual Top-3 if the percentages were above average. The result was our estimate of what the Top-3 percentage would be if a given college had the average percentage of A/B+ and rural students. (See section 8 of the full paper for additional details about how the adjustments were made.)

Figure 6 shows the effect of the above adjustments on the range for the Top-3 percentages. The top bar shows that the range before adjustment was 29.9 percent. The bottom bar shows that the range after adjustment fell to 15.6 point—a decline of 14.3 points. This large decline stems from the highest Top-3 percent falling from 45.4 percent to 33.6 percent — a decline of 10.9 points, and the lowest Top-3 percent rising from 15.6 percent to 18.0 percent — an increase of 3.4 points.

The large decline in the highest Top-3 percent produced by the adjustment is powerful evidence that, as hypothesized, colleges with the highest actual Top-3 percentages had many A/B+ and rural students—characteristics associated with attaining the Top-3 outcomes regardless of which college was attended. Thus, the colleges' high "success" rates were largely due to enrolling students highly likely to be successful.

Figure 6. Unadjusted and Adjusted Range for Percentage of Top-3 Outcomes
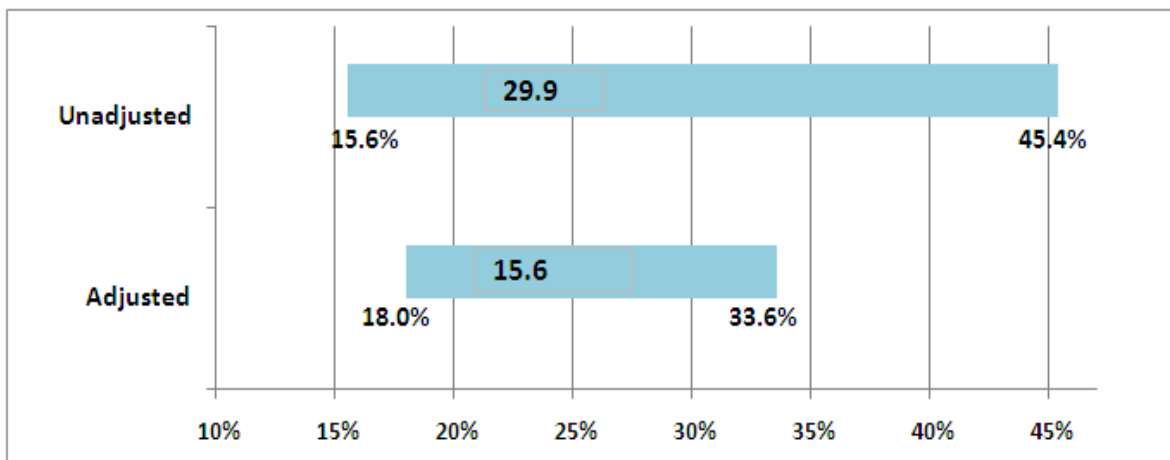
The smaller decline in the lowest Top-3 percent stemmed from some colleges with very low Top-3 percentages having small positive adjustments because their percentage of A/B+ and rural students were not much below average, while other colleges, as expected, had large positive adjustment because they had large adverse distributions of students—that is, many students less likely to attain Top-3 outcomes.

Figure 7 more clearly illustrate the key finding that colleges with the largest *negative adjustments* (because they had the highest percentages of A/B+ and rural students) were also the colleges with the highest or close to the highest Top-3 percentage, and colleges with largest *positive adjustments* (because they had the lowest percentages of A/B+ and rural students) were also the college with the lowest or close to the lowest Top-3 percentages.

The top two bars in Figure 7 show that the four colleges with the largest negative adjustments (adjustments that decreased their Top-3 percents the most) were at or near the top rank of all colleges with respect to the Top-3 percent before adjustment, but after adjustment they fell to just above the middle of the pack. The unadjusted average rank was 2.8, but the adjusted rank was 12.8 – just slightly above the 13.5 middle ranking.[6] The large decline in the rank indicates that the colleges at or near the top of the Top-3 distribution were at the top mainly because of characteristics the student brought with them when they arrived at college.

Figure 7. Unadjusted and Adjusted Rank of CCs with Greatest Negative and Positive Adjustments
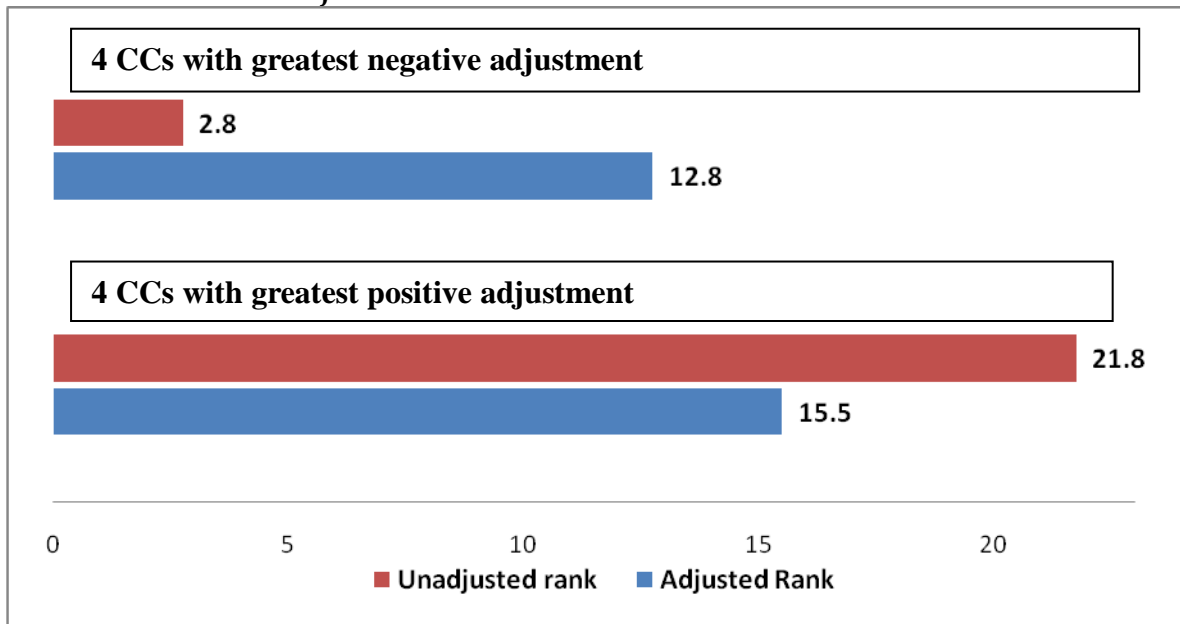
The bottom 2 bars in Figure 7 show that the four colleges with the largest positive adjustments (adjustments that increased their Top-3 percents the most) were at or near the bottom rank of all colleges with respect to the Top-3 percent, but after adjustment they rose to just below the middle of the pack. Before adjustments those four colleges were near the bottom, with an average rank of 21.8, with the very bottom being 27. But after adjustment the average rank rose to 15.5, which is close to the 13.5 middle ranking. The large increase in rank indicates that the colleges at or near the bottom of the Top-3

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[6] Given that 27 colleges were being ranked, the middle of the pack would have a rank of 13.5 (27/2).

distribution were near the bottom mainly because of characteristics the student brought with them when they arrived at college.

In summary, the results in this section demonstrate that:

- Much of the cross-college difference in percentage of Top-3 students is due to differences in the attributes students bring to the colleges prior to enrollment.
- Adjusting for differences in student characteristics substantially alters cross-college rankings.
- Those adjustments are essential to accurately assessing the extent to which differences in outcomes are associated with factors under the colleges' control.

More specifically, colleges where the actual Top-3 percentage is well below average often, but not always, have students whose characteristics make them much *less* likely to attain a Top-3 outcome regardless of which college they attended. Colleges where the actual Top-3 percentage is well above average almost always have students whose characteristics make them much *more* likely to attain a Top-3 outcome regardless of which college they attended. Thus, the adjustments play an important role in "leveling the playing field" so that a college's performance is not regarded as well below average because its students need a great deal of help to reach the Top-3 groups.

POLICY IMPLICATION III – CREATING INCENTIVES TO FOSTER IMPROVEMENT AND REWARD EXCELLENCE

This brief has described new outcome measures that can help students with different GPAs enhance their career outcomes without completing more credits, simply by completing more credits in moderate- and high-return concentrations. But in addition, by adjusting the new measures to account for cross-college differences in student characteristics, state and college decision-makers can use the measures to: (1) develop realistic goals that lead more students to achieve their career-enhancement objectives; (2) accurately assess the extent to which the goals are achieved over time; and perhaps most importantly, (3) provide indicators needed to reward improvement and excellence in ways that create powerful incentives that foster constructive change.

For example, a given college could establish realistic goals by comparing its Top-3 percentage to that of colleges enrolling students with the same characteristics as its own students. Individual colleges could also use the measures to give due credit to various college components that contribute to improved performance. For example, recognition could be given to departments that boost the number of students who attain certificates, who attain two-year degrees in moderate- and high-return fields, or attain four-year degrees after completing two-year degrees. Recognition could also be given to college programs and organizations that provide career counseling and other types of support

to help students better understand their options, go further through college, and end up in the Top-3 outcome groups.

Recognition can strongly motivate individuals and groups to meet clear-cut goals with available resources, and recognition should be a component of any continuous improvement system. Financial rewards, however, have even stronger positive effects.

Colleges can use the measures discussed here to change the allocation of resources in ways that improve outcomes from student perspectives. States also can use the adjusted measures to allocate resources to create incentives to better meet students' objectives. For example, the state could reserve a higher proportion of community college financial support to be allocated to individual colleges based on the number of students achieving positive outcomes. Specifically, bonuses, which have been shown to be successful in other similar research, could be awarded for each student who completes a certificate, attains a two-year degree with a moderate- or high-return concentration, or attains a four-year degree after attaining a two-year degree.

The amount of the awards could depend on the difficulty of achieving the outcome as well as its value to the students. For example, the bonus for students attaining four-year degrees could be considerably larger than for those attaining a two-year degree with a low-return concentration. Also, the bonus could be larger when students with lower GPAs or other impediments achieve more positive outcomes.

An important aspect of proportioning awards to the benefits students receive is that it helps ensure that resources are available to increase the accessibility of high-return concentrations. This is particularly important because many high-return concentrations are in health care and technical fields that require expensive equipment and specialized facilities.

Bonuses could also be offered for *increasing* key positive outcomes above current levels as well as for reaching the levels of the best-performing peer colleges with similar students. Bonuses could be offered for a given amount of improvement (taking into account how far below the maximum level is a college's starting point). Alternatively, large cash awards could be made to colleges that most improve their performance (taking into account their initial level and student characteristics). Economists favor "tournaments," where the winner gets a very large prize and runners-up get small prizes (like golf tournaments); these tend to produce the greatest improvement at the lowest cost.

POLICY IMPLICATION IV – IDENTIFYING BEST PRACTICES

Finally, the regression-adjusted cross-college differences in outcomes could be used to identify factors that facilitate or impede achievement of positive outcomes. Researchers

could work with the colleges to determine what factors (under the colleges' control) differentiate those with the most positive and least positive adjusted outcomes, and what factors have especially large effects. Such identification could lead colleges where performance is lagging to adopt practices likely to have the largest effects and the lowest cost, as well as to drop practices likely to decrease positive outcomes.

For example, it would be well worth determining why large proportions of students at Florida's small rural community colleges obtain certificates, but large proportions of students with similar GPAs at many other colleges complete about the same number of credits but leave college without any credential. This difference is particularly important because the median earnings of students with certificates are $8,700 higher than students with 25+ credits and no credential.

More generally, it would be worthwhile determining why some colleges have actual Top-3 earnings percentages <u>far greater than predicted</u> by the regression model, taking into account the characteristics that students bring with them upon entering college. Understanding the underlying factors and practices that lead similar students to end up in the Top-3 groups could uncover ways to redistribute resources so many more students achieve career-enhancing goals. For example, providing more resources to assessment, counseling, and other student services might greatly help students make better-informed choices leading to superior outcomes from their own point of view. Finding ways to boost positive outcomes with the same or even fewer resources is especially important today when community college budgets are stretched thin and likely to decrease further.

SUMMARY AND CONCLUSIONS

One key goal of the full study was developing new community college outcome measures that align with students' intent to improve career outcomes as well as their intent to obtain various credentials. A second key goal was finding ways to adjust the measures so that they provide meaningful comparisons across colleges by taking into account how the characteristics students bring with them upon enrollment affect outcomes. A third key goal was to illustrate how state and community college officials can use the adjusted new measures to improve community college performance in ways that lead more students to achieve their goals.

This analysis was developed using files from the Florida Department of Education data warehouse covering all students who were first-time 9th graders in 1996 and attended Florida community colleges between 2000 and 2007. These data were sufficient to place each student into one of six outcome groups based on credentials obtained, credits completed, and concentrations in high-, moderate-, or low-return fields of study.

Perhaps the single most important finding in the study was that **students with about the same high school GPAs completing about the same number of credits would very substantially increase post-college earnings simply by substituting moderate- and high-return credits for low-return ones**. In particular:

- Median earnings of students with certificates were $8,700 higher than those of students left college with 25+ credits but no credential.
- Median earnings of students who left college with moderate- or high- return concentrations were $12,000 higher than those of students who left college with two-year degrees in low-return concentrations.

An equally important policy implication follows from the above finding: it is likely that **students would switch to credits that would very substantially raise their earnings if colleges gave them accurate information about the concentrations available to them; the earnings-enhancing effects of those concentrations; and the academic and non-academic skills required to complete different concentrations**.

Because highly relevant information could be imparted at low cost and could make a very large difference to future earnings, it would be very worthwhile to at least test the hypothesis that students lack information and that lack is a major factor in students' not ending up with Top-3 outcomes. This hypothesis could easily be tested through a combination of surveys and demonstrations where randomly selected students would be given relevant information and their subsequent choices of concentration and credentials observed and analyzed.

Another set of important findings relates to variation in the cross-college percentages of students with Top-3 outcomes and how much that variation was due to differences in characteristics students brought with them upon enrollment versus the way colleges performed. The key conclusions are that:

- Top-3 outcomes varied widely across the 27 colleges with sufficient samples to make these comparisons.
- Two-thirds of the outcome differences can be explained by differences in student attributes.

The important policy implications of these findings are that: (1) unadjusted differences are unsuitable for comparing performance across colleges (and most likely across divisions within colleges as well); and (2) substantial residual variation across colleges remains even after adjusting for differences in student characteristics.

Colleges show considerable room for improvement in performance. Significant constructive change can be expected if college decision-makers use the adjusted outcome measures developed in this study to reward excellence, create incentives to

improve performance, and set feasible goals. The results of this study are strong enough to make it highly worthwhile to at least test the effects of using the measures to promote improvement.

This analysis hopes to stimulate action that will lead to: (1) more students achieving career-enhancement and other goals, and (2) more administrators using these measures to effectively set goals, monitor progress, and create incentives that will help more students meet their goals. Both actions are especially relevant at a time when community colleges are becoming the focal point for improving students' career outcomes but have fewer resources to accomplish this critically important mission. Thus, taking the concrete steps suggested by this research could provide precisely **the information needed by students to make better decisions about what concentrations and credentials to pursue and by administrators to make better decisions about how to effectively allocate whatever resources are available**.

Appendix Table A1. Earnings Group by Concentration and Education Level

	Education Level			
	25+ Credits	**Certif- icate**	**2-Yr Degree**	**2 & 4 Yr Degree**
Career and Technical Education (CTE) Concentrations				
1 Agriculture & Natural Resources			L	H
2 Business & Marketing	H	L	M	H
3 Communications & Design	M		L	H
4 Computer Sciences	M		L	H
5 Education	M		L	H
6 Engineering & Architecture	M	L	L	H
7 Health Care	M	H	H	H
8 Personal & Consumer Services	L	L		
9 Protective Services	H	H	M	H
10 Public & Social Services				H
11 Trade & Industry	M	H	M	H
Arts and Sciences Concentrations				
1 English	M		L	H
2 Fine & Performing Art	L		L	L
3 Humanities	M		L	
4 Math	M		L	
5 Science	M		L	L
6 Social Sciences	M	H	L	L

H = high return; M = moderate return; L = low return
Blank = less than 1 percent of students are in a given concentration
The return designations are separately calculated by education level.
Results are broken down only for students with two-year degrees in the main body of the paper because about 65 percent of students with two-year degrees are in the low-return group. At other education levels most students are in a single group.