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ABSTRACT

In an effort to obtain a more complete picture of student outcomes, the City Colleges of Chicago (CCC) undertook a 6-year study of the academic experiences of 10,777 students who entered in fall 1986 with no previous college experience. In addition to basic data on student characteristics, the study gathered information on student persistence in the college, completion of a degree or certificate, and transfer to a four-year institution. Outcomes for fall 1986 to spring 1992 for the entire cohort revealed that 12.9% transferred, 8.1% completed a degree or certificate, and 4.4% of students were still enrolled. Analyses were also conducted for those students in the cohort who completed at least 12 credit hours, completed at least 2 semesters, and/or were in baccalaureate/transfer programs, as well as by student goals. Rates for students with at least 12 credits were significantly higher than for the whole cohort regarding transfer, completion, and persistence, while rates were moderately higher for those with 2 semesters and in transfer programs. The study also sought to identify important factors in determining student success, finding that: (1) student grade point average and an intent to transfer were positively related to success; (2) both age and weekly job hours were negatively related to success rates; (3) ethnicity and original intent were also found to be significantly related to outcomes; and (4) factors which had no significant impact included gender, student enrollment in a baccalaureate or transfer program, and family income. (Contains 15 references.) (KP)

A Longitudinal Model for Assessing Student Outcomes at a Community College

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Abstract

This paper summarizes the results of a longitudinal study of a cohort of students at the City Colleges of Chicago (CCC); it examines the rates these students transferred to four-year colleges, completed degrees and certificates, and persisted in the City College system. It examines the outcomes achieved by over 10,000 college credit students who entered the CCC in the fall of 1986. This longitudinal study is the first of its kind at the City Colleges; before it was undertaken, there was no systematically-collected dataset following our students over the course of their studies. The aim of this study is to produce systematic measurements of selected student outcomes, as a part of the ongoing process of assessing institutional effectiveness and enhancing institutional accountability. Subsequent reports, following a similar methodology, will assess other outcomes.

A Longitudinal Model for Assessing

Student Outcomes at a Community College

Introduction

Evaluating the success of a community college system is always very difficult. Numerous questions arise about how to define success, how to judge whether or not students do well and what types of students or programs to focus on. In most cases, however, the overriding problem is that adequate information does not exist. Rarely do community colleges have the resources to follow their students for a sufficient amount of time. Up to this point, the City Colleges of Chicago have only been able to monitor student outcomes in limited ways, especially in light of increased requirements for documenting student outcomes, improving the level of research is important.

The CCC Office of Institutional Research has embarked on a long-term project to meet this need. The aim is to produce systematic assessments of how well the City Colleges are meeting their goals. A key ingredient here is raising the quality of available information. Therefore, one of our first tasks was to construct a dataset which follows a cohort of entering students through six years of their college experience. It is only with this type of prolonged tracking of students that one can accurately address critical questions. The following report attempts to answer several such questions. Among them are:

- What percentage of students earn an associate degree or certificate, and how long on average does it take to earn one?
- How many students transfer to a four-year college?

- How long do students stay in the college system, and how often do they leave and then re-enroll?
- Do the students' academic goals and intentions determine what they accomplish at the City Colleges?
- What other factors affect whether students transfer, earn a degree, or drop-out?

There is a serious problem when one tries to transform these types of questions into operational indicators. Definitions have become a thorny issue for institutional research. For example, when computing how many students transferred, one can look at all students, or only at those who entered the City Colleges with the actual intent of transferring. Many other such choices exist. Always involved is the decision of whether to narrow the student body down to a group of "academically-oriented" students. In fact, many studies compute transfer rates or degree-completion rates for a restricted subset of the student population. Various criteria have been used in making this restriction; for example, the student must have stated at the outset that he/she wanted to earn a degree; or the student completed at least 12 credit hours (Cohen, 1991).

On the one hand this practice makes sense. Students enroll in community colleges for many reasons. Outside of the "academic" students there are those who want to learn English, others who hope to train for a new occupation, and still others who attend for personal enrichment. In light of this diversity, it does not make sense to compute a transfer or degree-completion rate for all students.

On the other hand, a central goal of a community college is to prepare and train students for a competitive and demanding labor market, even if they lack basic skills or

have demanding family and work responsibilities. For example, if a student enters the system trying to earn a GED and then completes it, the college would encourage further study, perhaps toward a degree. Indeed, as shown below, students often raise their goals as they take courses and "catch up" to college level ability. These considerations would point against restricting one's focus to a specific subset of students.

Since this is an exploratory study, this report will take both approaches. We first describe general outcomes for the entire student body, and then the behavior of particular groups is examined. This is a fair compromise and avoids the appearance of selecting a particular approach which may yield more favorable statistics.

Literature Review

Student outcomes assessment is a prevalent topic in institutional research literature. Numerous studies have been produced dealing with student persistence, attainment and achievement. Landmark studies include: Tinto (1975), Bean (1985), Pascarella, Smart, and Ethington (1986), Lee and Frank (1990), and Cabrera, Nora and Castenada (1992). However, the current interest in student outcomes assessment has transcended from the field of academicians and education researchers and penetrated the realities of college administrators, policy makers, governing boards, accreditation agencies, and the general public. This study takes a practitioner's approach to assess three student outcomes: persistence in the community college, completion of a degree or certificate in the community college and the transfer from a community college to a four-year institution.

The college-based studies reviewed for this project were mainly targeted to community colleges; the populations studied were credit students. A common limitation is that different studies use different methodologies in terms of the criteria they use for defining entering cohorts, calculating persistence, graduation rates, and transfer rates. In order to achieve comparability of results among the studies it is necessary for institutional researchers to develop common methodologies for conducting longitudinal studies. In the case of four-year institutions, because there is more homogeneity in the student academic goals, it is relatively easier to identify completers (earned degree), persisters (continuously enrolled), stopouts (left and return), and dropouts (left and did not return) (Porter 1989). However, in the case of community colleges it is considerably more difficult to come up with comparable studies because of the diversity of the interests and aspirations of community college students. However, this is a challenge that community colleges must address.

There are a number of important factors which must be considered by any study dealing with persistence and retention in community colleges. Community colleges are often referred to as "two-year colleges," yet it takes those who obtain associate degrees an average of four years or more (Dillon, 1990; Garcia & Thompson, 1990). In addition, data from another study indicates that most students take a total number of units that exceeds requirements for an associate degree (Dillon). Other data from several studies show that three in five students stopped out for at least one semester in the time of their pursuit of associate degrees, (Porter; Pascarella, Smart & Ethington, 1986). The literature identifies factors which increase chances of transfer from a two-year program

to a four-year college: higher socio-economic status (SES), predisposition to transfer, attendance at Catholic high schools, higher test scores, full-time student status, and employed part-time or less (Lee & Frank, 1990). In accord with much of this data are studies indicating that minority students tend to have lower rates of transfer (Lee & Frank; Nora & Rendon, 1990; Dillon). Again, it should be noted that the findings in most of these studies shift depending on approach. For instance most persistence rates increase when the initial cohort includes only those who intend to transfer in the first place.

Palmer's (1990) research reviews student tracking systems developed by community colleges with the purpose of helping colleges to associate the relationships between student outcomes, student intentions, and student attributes. Palmer states:

> Student tracking systems are longitudinal data bases that identify attributes and educational goals of entering students, track student progress toward those goals on a term-by-term basis, and provide informational feedback for institutional planning and improvement (p 6.)

Also from a practitioners perspective, the work of Ewell (1987) contains useful information that should be taken into consideration in the design and construction of longitudinal files for conducting retention and student flow studies.

The Data and Definition of Outcomes

The Office of Institutional Research constructed a longitudinal dataset of an entering class of students. This means that the we followed the same group of students as they progressed through the college system. Specifically, the cohort consists of 10,077 new students with no previous college experience who entered any one of the City Colleges of Chicago in the fall 1986 semester. This group was tracked for six years, until the end of the spring 1992 semester.

A variety of information was collected along the way. First, of course, basic student characteristics such as race/ethnicity, age, working status, income, academic goals and intentions, etc. Second, semester-by-semester data on whether the student registered; how many courses he or she completed; remedial courses taken; whether financial aid was received, etc. Third, the highest degree the student earned during the six years, and when it was obtained. And finally, whether or not the student transferred to a four-year college. This information was taken from a 1990 Illinois Community College Board transfer study (1992). This study determined whether students transferred by searching registration records from four-year colleges throughout the state for the students in this cohort. An important point here is that since the transfer study was conducted using the Transfer Assembly model (Cohen, 1991), it missed students who may have transferred after fall 1990. This is a fact that must be noted whenever transfer rates are presented. [1]

This report focuses on a specific set of outcomes--a number of other outcomes are just as important, but will be taken up in later reports. First, we look at the "degree completion rate". That is, the percent of students who earned either an associate degree

or an advanced or basic certificate within the six years. The great majority of the students (92%) who fall into this category earned an associate degree, with a small number earning certificates. Secondly, we look at the "transfer rate," i.e. the percent of students who transferred to a four-year college between 1986 and 1990. This number will probably be underestimated since it does not include students who transferred after 1990. It must be kept in mind that the transfer data for this study came from the Illinois Community College Board transfer study. Third, we focus on "persistence," i.e. the percent of students who were still enrolled in one of the city colleges in the spring 1992 semester. We also use the term "stop-out," meaning a time period where the student left college for one or more semesters but then re-enrolled. We avoid use of the term "drop-out." From the available information it is impossible to tell whether a student truly dropped-out or simply left college after having achieved his or her goal.

Student Characteristics

The students in the sample form a highly diverse group; only a brief sketch is given here. A detailed description of the typical entering student body at the City Colleges of Chicago can be found in two reports produced by the Office of Institutional Research (Gutierrez-Marquez, 1993; Gutierrez-Marquez & Gonzalez, 1991). In our cohort, women slightly outnumber men. The majority of the entering class is non-white (70%). In fact, one out of every two students is African-American. While a good number of students have families to support, many are single and have no children. This is in part because the student body tends to be young, although a significant portion are in their 30s and 40s. Overall, two-thirds of the students work at least part time, and a

large number are unemployed. Yearly family income tends to be low; many earn less than $20,000 a year, and 44% of the students earn less than $9,000.

Outcomes for the Entire Student Body

The focus begins with an examination of indicators of student achievement for the entire entering class. Table 1 describes what the 10,077 students accomplished in the City Colleges of Chicago between the fall 1986 semester and the spring 1992 semester.

Table 1: Selected Outcomes For All Students (N=10,077)

Outcome	% of students	No. of students
Student transferred	12.9	1,298
Student completed degree or certificate	8.1	816
Student was still enrolled at the end of six years	4.4	444
Student falls into one or more of the above categories	21.7	2,186

Thus, roughly one out of eight students transferred to a four-year college at some point in the four years after enrollment. Fewer received an associate degree or a certificate in the six years, roughly one out of twelve, and the number enrolled at the end is quite small. Overall, one-fifth (22%) of the entering student class achieved one of the standard outcomes that researchers typically look for.

One reason these rates are low is that many students do not stay in the college system for a sufficient amount of time. In fact, more than one-half of the entering class permanently left college after the first or second semester, as Table 2 shows.

Table 2: When did students leave the City Colleges of Chicago? (N=10,077)

Student left the college:	% of students	Cumulative %
After 1 year	55.8	55.8
After 2 years	13.5	69.4
After 3 years	10.3	79.6
After 4 years	7.1	86.7
After 5 years	5.7	92.4
After 5 1/2 years	1.7	94.1

It is necessary to examine whether enrollment patterns indicate an unusually high attrition or whether some students actually only plan to attend a college for a short period and accomplish their goals within that time. However, the large number of students leaving after one year may indicate that there are insufficient support services to retain students in the colleges. Empirically it appears that both arguments hold. Of the students who left college after one or two semesters, there were indeed many who enrolled for short-term purposes, such as preparing for a new occupation or improving job-related skills. However, 40% of these students said they wanted to transfer to a four-year college or earn an associate degree. This latter group clearly had long-term goals but for a number of reasons could not remain in college long enough to achieve them.

In fall 1991, the Office of Institutional Research released a report addressing the nonreturning student issue. The report indicates that personal and work-related problems are the most common reasons that prevent students from returning to school (Gutierrez-Marquez, 1991).

In either case, it is clear that the transfer, completion, and persistence rates are low because many students leave college too quickly to achieve one of the three outcome categories. Completing a degree or certificate takes a considerable amount of time. Table 3 gives a sense of this process for the 816 students who earned a degree or certificate.

Table 3: Amount of Time Students Took to Earn a Degree or Certificate

No. of years	% of students earning degree or certificate[a] N=816
1	4.8
2	15.9
3	35.7
4	22.7
5	11.4
6	9.6

[a] associate degrees 753 (92%); certificates 63 (8%)

A majority of students did not earn an associate degree or certificate in the "expected" time period of two years. Most required three or four years, and roughly a

fifth required five or more years. Part of the reason for such long time spans is that students frequently took time off as they worked toward their degree. More than 80% left and returned to college at least once. In fact, one-third of them did so three or more times. This high incidence of stop-outs for degree-earners almost certainly indicates that students face many external obligations while attending college. It may also begin to suggest why so few students actually manage to complete a degree or certificate.

Accumulating sufficient credits and skill to transfer to a four-year college also takes time, although not as much. The students in our sample who transferred tended to enroll for at least one more semester than those who did not. They also accumulated more than twice as many credits. Preparing for transferring clearly requires time, commitment, and resources; those students who transferred stopped-out less and thus could work consistently toward their goal.

In sum, many students in our sample were not enrolled long enough to achieve one of the basic outcomes. Table 4 vividly shows how this operated. The trend is striking. For students who enrolled eight or more semesters (665), close to one-half earned a degree or certificate, which is a much higher rate than for the entering class as a whole. Similarly, out of the students who enrolled six or seven semesters (773), more than twice as many transferred to a four-year college as compared to all students.

Table 4: How Outcomes Were Affected by Length of Stay in the CCC

Total no. of semesters student completed	% of group that:	
	Transferred N=1,290	Completed degree or certificate N=816
	7.7	.1
2 - 3	12.7	1.9
4 - 5	20.7	11.9
6 - 7	26.5	35.1
8 - 9	18.8	46.2
10 or more	9.6	50.9

In light of this strong relationship, many would argue that it is misleading to compute outcome rates for all students. Why, after all, include students who only enroll for one or two semesters and only take a couple of courses? Such students want something very different from their college experience, the argument goes, and so should be excluded from the analysis. Success for a college means providing the services students want, and so transfer or completion rates should only be computed for students who want transfer or earn a degree.

We, therefore, turn to a more focused analysis and test whether or not the basic rates are higher for specific sets of students. As will become clear, the answer varies depending on which selection criterion used.

Outcomes for Certain Types of Students

First, three criteria are defined which are commonly used by college researchers. The first is completion of 12 or more credit hours. The second, suggested by findings from the previous section, is completion of two or more semesters. These two approaches are quite similar and attempt to include students with some sort of perseverance or tenacity. The third criterion is enrollment in baccalaureate/transfer programs vis a vis occupational or vocational programs. The idea here is that enrolling in these types of programs indicates a student who intends to earn a degree or transfer. Indeed this seems to be the case, to some extent at least, as seen in Table 5. The last row repeats the outcome rates for all students so that comparisons can be made.

Table 5: Outcomes for Restricted Groups

Restricted group, students who:	Transfer rate	Degree completion rate	Still enrolled by spring 1992	N
completed at least 12 credit hours	19.1%	17.3%	10.5%	4,640
completed 2 or more semesters	16.7	13.9	9.6	5,815
baccalaureate/transfer programs	15.5	8.3	5.9	5,770
All students	12.9	8.1	5.9	10,077

Clearly all the outcome rates benefit from restricting the student body in some way. The improvement is most pronounced when looking at students who completed at least 12 credits. Here the degree completion and persistence rates actually double in size, and the transfer rate increases significantly. The same is true for students who completed two or more semesters, although the effect is weaker. There is obviously considerable overlap between these two groups, and they seem to tap the same student characteristic. Surprisingly, students who enrolled in degree/transfer programs do not show as strong a difference from the overall student body in their outcomes. Only the transfer rate is higher. One expects larger differences since enrolling in these types of programs vis a vis occupational or vocational ones seems to indicate a more "academic" orientation. Here is one indication that many other factors enter into students' achievement of tangible goals in college.

Rather than using these somewhat indirect measures, however, one could also just look directly at the aspirations that students have when they enter college. The students in our sample answered two questions along these lines. The first question was presented when students entered the college system at registration for the fall 1986 semester and probed for the student's intent in enrolling.[2] Table 6 collapses the answers into several groups and shows outcomes for each.

Table 6: Effect of Students' Original "Intent" on Outcomes

Student's original intent	Transfer rate	Degree completion rate	Still enrolled by spring 1992	N
Transfer to a four-year college	33.0%	11.4%	4.7%	1,511
Prepare for a new occupation or career	10.3	9.3	4.3	5,998
Improve skills	7.3	3.2	3.8	1,448
Other	6.7	3.6	5.3	1,120

Clearly strong differences occur depending on the goals students set for themselves. Roughly one out of three students who wanted to transfer did. Compared to the entire student body, this is a much higher rate. In an absolute sense this figure indicates that a majority of the students who intended to transfer were not able to for one reason or another. There is also the problem of shifting goals and intentions as students progress through the college system. A good number raise their aspirations in this process, perhaps after having taken enough remedial courses to "get up to par". For example, 10% of the students who originally wanted just to take courses to improve their career chances later changed their goals to transferring to a four-year college. Thus, the students' most recent goals were also recorded. For students with the recent intent of transferring, the transfer rate was lower (28%), although still sizeable. This may have resulted because students who recently changed their goals did not have time to attain

them. It may also result because a less selective group has entered the pool--students with more diverse backgrounds and skill levels.

Another question was asked which focused on specifically academic objective. The problem with this question is that only the most recent response was recorded, not the original one. The same type of changes that occurred with the first question could have taken place with this one in the intervening time period. Still, as Table 7 shows, there is clearly an effect.

Table 7: Effect of Students' Academic Objectives on Outcomes

Student's academic objective	Transfer rate	Degree completion rate	Still enrolled by spring 1992	N
Earn an associate degree	13.3%	15.1%	7.3%	4,097
Earn an advanced or basic certificate	11.3	5.5	4.7	1,776
Take courses	13.2	2.4	1.5	4,204

Clearly the degree completion rate is much higher for those who actually intended to earn a degree. On the whole, one must conclude that the outcome rates are not as high as hoped. More often than not, even students who apparently have the aspirations to transfer or earn degrees do not.

Other Determinants of Outcomes

We, therefore, move to an examination of other factors that may be affecting students' accomplishments in the CCC. This is a difficult task. Although our dataset is the most informative to date, it does not contain much of the information one would want.. We do not know exactly what caused a student to leave college or to fail to accomplish his or her goals. At most one can infer what happened by looking at a number of indirect indicators.

Demographic characteristics

Unfortunately, we do not have information on students' personal characteristics. For example, the majority of students did not give us their marital status or the number of children they have, so that analysis of these factors is not possible. But we were able to compare some demographic aspects. In terms of gender, there are few differences between men and women in transfer rates, completion rates, and persistence. Age also does not have as big of an effect as expected. The only noticeable difference lies in the transfer rate. Students who were between 16 and 23 years old when they entered the CCC system were noticeably more likely to transfer (19%). Students older than this had roughly similar transfer rates with a slight decline evident for those in the 40-50 age range. This is in part a function of increased family and work responsibilities for older students. Lastly, there are also few differences between the various races and ethnic groups--again a surprise. The only marked pattern is that Asians were more likely to transfer (23%). All other groups showed few differences, and in terms of degree-completion and persistence, none of the groups stood out with higher rates.

Academic performance and skills

How well students perform in college, and the skills that they bring with them also play important roles. We have several indications that this is so. First, students with higher grades transferred and completed degrees more often and remained in the college system longer. Those that had a cumulative grade point average of A or B tended to transfer almost twice as often (20.9%) as those with lower GPA's. The degree-completion rate (15.6%) was also noticeably higher.

Many would conclude that this relationship takes place because better motivated students both accomplish more and perform better academically. However, part of the explanation is the skill-level that students bring to the college system. An indicator of academic preparedness is the extent to which students took remedial courses. Therefore, we looked at how many courses a student took and identified the proportion that were remedial courses. The effect is quite strong. Students who took only a small number of remedial courses (10% or less) were four times as likely to transfer than those who took mostly remedial courses. Moreover, no one out of this latter group completed a degree or certificate. Thus, although students may be motivated, the lack of adequate skills presents a formidable barrier. "Catching up" to college-level abilities takes a lot of time and hinders one's ability to work toward a degree or accumulate enough credits to transfer.

Financial Resources

Financial resources are a potential factor in student accomplishment in college. For example, being able to pay for a sufficient number of years of attendance is no small matter for a student body that is generally poor, and we also know that degree-

completion rates go up significantly with time spent in college. The presence of other providers can also allow a student to work less and therefore have more time for school, and we know that uninterrupted, intensive college attendance is conducive to transferring. Unfortunately, we do not have complete information on the student's family income for close to one-third of the students; the following numbers are therefore merely suggestive.

Students with higher incomes transferred more frequently, reaching a high of 19.1% for those in the $24,000 to $30,000 income range. In addition to the reasons given above, it may be that these students could also better afford to transfer to four-year colleges, which often cost more. Degree-completion rates did not, surprisingly, differ that much between income groups; but persistence did. For students with family incomes of $30,000 or higher, the percentage still enrolled by 1992 was twice that of the entering class. Clearly money affects how long students remain enrolled and subsequently attain tangible goals. In fact, the higher the income, the more semesters a student completes. Moreover, students with higher incomes are much less likely to: (a) Register for courses but then withdraw or drop out from them, and (b) Register for a semester and drop out altogether.

Time Commitment

It should be clear that time is another critical resource. Work and family responsibilities can greatly limit the amount of time and energy a student can commit to college; transfer rates, completion rates, and persistence go up strongly with the number of semesters a student completes.

Employment also has a strong role to play. The problem, again, is that we do not have employment information for 32.5% of the entering class. Nevertheless, the effect is strong. Students who worked full time had noticeably lower transfer and completion rates. Students who worked only part time transferred more often (21.3% as compared to 12.2%) and were twice as likely to complete a degree or certificate (13.5% as compared to 6.9%). Unemployed students fell in between these two groups. Unquestionably, working full time reduces what a student can expect to accomplish in college. What makes this important is that close to one-half of the student body (43.1%) worked full time. Other indicators of the disadvantage this status creates is that such students completed markedly fewer semesters of college. And they were also less likely to carry at least some type of financial aid (17.1% as compared to 31.9% for part-time workers). Lastly, they were also more likely to register for, but then drop, courses; working full time evidently makes course-completion more difficult.

It might be argued that students who work full time enroll in the CCC for a diverse number of reasons--that the basic outcome rates are low because these students often enroll for short-term reasons or personal enrichment. This may be true to some extent. However, three out of four of the students working full time declared that they wanted to transfer or earn a degree. We must conclude then that work responsibilities often prove to be detrimental to students' college goals.

The importance of time plays itself out in other ways as well. The incidence of stop-outs in a student's college career signifies something about how much a student is able to commit himself or herself to college. Students who have a large number of stop-

outs may still be motivated but need to take time off at various points to fulfill other obligations in their lives or accumulate enough money to register again. When one looks at how often students stop-out, it becomes clear that basic outcomes are adversely affected. The following results are for students who were still enrolled after the first year of college;this is because students who left after one year or earlier could not have experienced a stop-out.

Table 8 shows clear differences. Students who were able to enroll continuously were roughly twice as likely to transfer and almost twice as likely to complete a degree or certificate. The absolute rates for these students are also quite high; note, however, that very few students are able to enroll continuously. Apparently, attending college for any significant amount of time without interruption is very difficult. Lastly, the fact that students with one or more stop-outs are much more likely to be registered at the end of six years is self-explanatory--the more often one takes time off from college, the longer one requires to accomplish one's goals.

Table 8: Effect of Stop-outs on Outcomes

for Students Who Were Enrolled After One Year of College

No. of stop-outs the student experienced:	Transfer rate	Degree completion rate	Still enrolled by spring 1992	N
None	31.0 %	26.8 %	2	407
1 or more	16.8	16.6	441	4,043

Finally, another facet to time commitment is the student's ability to enroll full time. The effects are as expected. If students enroll full time for most of the semesters attended, the transfer and degree completion rates are much higher. This recalls the impact of employment status discussed above. Students who frequently enroll full time are likely those who have been able to reduce the amount of hours they work, freeing up their time to commit to their college education.

Explaining "Success"

There now is some sense of the range of factors that can help one understand why some students accomplish tangible goals in college while others do not. But we need to know more. Just how strong are these factors? Which ones are more important? Do they have as strong an impact as the students' motivations, aspirations, and goals? This section tries to give some preliminary answers to these questions. Definitive answers will have to wait until we have better data on what happens as students progress through the CCC system.

Further, we will try to identify what differentiates two groups of students: First, those students who either transferred, earned a degree or certificate, or were still enrolled at the end of six years. For lack of a better word, these are students who "succeeded." Second, those students who did not accomplish any of these three tangible outcomes and therefore "did not succeed."

The first point is that academic goals are by no means the only or even the dominant factors that distinguish the groups. Of the students who did not succeed, the majority nevertheless had high aspirations. Fully 60% intended to transfer to a four-year college or earn a degree or certificate. While these percentages are lower than for those

students who did succeed, they are quite large. Clearly it is not the case that students who failed to transfer or earn a degree were largely attending college for other reasons.

Another point is that two-thirds of the students who did not succeed left college within a year after registering (64.7%). One year of attendance is not long enough to accumulate enough credits for a degree or for transferring, and yet many of these students wanted to do so. This is important for how computing the three basic outcome rates. If one restricts the calculation to students who completed more than 12 credits, as many colleges do, then one misses these students, who have high aspirations but are not able to act on them.

What then accounts for success or lack of it? In order to answer this question, statistical models were used which allow us to predict success with a variety of factors. The critical benefit of using these models is that one can identify which factors are more important. Table 9 gives the results of our first attempt at predicting success, using some of the factors discussed in the preceding section.

Table 9: How Some Basic Factors Predicted Student "Success"

(see text for definition of success)

Factors which were very important	- The student's grade point average - The student's age - The student's weekly job hours - The student's ethnicity	- Increases success rate - Decreases success rate - Decreases success rate -Significant
Factors which had no significant impact	- The student's family income - The student's gender	Not significant

The variables in the table are listed in declining order of statistical significance, i.e. the most important factor identified by the model was cumulative grade point average-the least important was gender. The most surprising result is that family income doesn't determine success.[3]

. However, measures of a student's goals and aspirations were not included in the model. It may well be, as many researchers argue, that goals and motivations are the dominant factors in determining what a student accomplishes in college. Our second model therefore a.lds the following factors: the student's academic objective; the student's original intent (as coded in 1986); the student's last intent; and whether the student enrolled in a baccalaureate/transfer program. The results are given in Table 10. Note first that the effect of ethnicity decreases once these additional factors are included. This means that part of the effect of ethnicity is a function of the student's goals; although the signs of the estimated effects remain the same as before.

Table 10: How a More Diverse Set of Factors Predicted Student "Success"

(see text for definition of success)

Factors which were very important	- The student's grade point average - The student's age - The student's academic objective - The student's intent to transfer - The student's weekly job hours	- Increases success rate - Decreases success rate - Increases success rate - Increases success rate - Decreases success rate
Factors which were moderately important	-The student's original intent -The student's ethnicity	-Significant -Significant
Factors which had no significant impact	- The student's gender - Whether the student enrolled in a baccalaureate/transfer program - The student's family income	Not significant

Again, the variables in the table are listed in declining order of significance. The student's academic objective and intent to transfer are clearly both important factors and result in a significantly higher success rate. The type of program enrolled in does not appear to have a large effect.

But other factors remain critical, even after we take into account the student's college goals. Working status also retains its place of importance, as does age. The preeminent effect in both models is grade point average, with a partial association more than twice that of any other variable.

A final word of caution. These results are not overpowering for the following reason; taken as a whole, the factors tested in the above models do not come close to accurately predicting (69% and 73%) whether or not a student will "succeed" in college. The effects are significant and striking, but they are nowhere near comprehensive. What this simply tells us is that the analysis is trying to understand a very complex process. Knowing a handful of details about our students is not enough. There are clearly a whole set of other factors which play a role, which we do not have information on and cannot be measured. This is the task of future research.

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Footnotes

[1]It should be noted that due to the method used for creating the longitudinal file for this study, the number of the students in the cohorts of the Illinois Community College Board transfer study and this study are not identical.

[2](1) Prepare for new occupation; (2) Prepare for a promotion; (3) improve job skills; (4) explore courses; (5) transfer to a 4-year institution; (6) remedy basic skills; (7) personal interest; (8) prepare for GED; (9) learn English; (10) Obtain a HS diploma; (11) other.

[3]Another qualifier. Income is a variable with a large percentage of missing cases (over 2800), so until a better understanding of the relationship between missing values and income can be established, the results need to be viewed with caution.