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ABSTRACT

These three research briefs, all by the same author, offer different perspectives on the earnings of North Carolina community college students. "Earnings of Community College Students before Enrolling" documents the income levels of the entering cohort of new freshmen for the 1991-92 academic year and attempts to establish the correlation of income to age. Data indicate that the median quarterly income, prior to enrollment, of new students was below $2,500 for the fourth quarter of 1990 and the first three quarters of 1991, and that there was no impact of age on earnings. "Impact of Community College Program Completion of Median Earnings" compares earnings prior to enrollment in a community college program with earnings following program completion. Data reveal that the median income of completers was over $1,600 per quarter greater than that for entering new freshmen with reported prior earnings, even controlling for inflation. If a representative individual were to remain in his/her chosen field for 30 years and were to be employed for all of that time, a projected life-time increase in earnings would be over $192,000. "First Year Earnings of Public Postsecondary Education Completers" compares the earnings of students who completed a postsecondary program by type of degree (i.e., certificate, diploma, associate in applied science (AAS), bachelor's degree, master's degree, and doctorate). Data indicate in the first year of employment, AAS graduates in Florida earned more ($23,102) than bachelor's degree graduates ($21,923). (KP)

Earnings of Community College Students before Enrolling, and the Impact of Community College Program Completion on Their Median Earnings
[and]
First Year Earnings of Public Postsecondary Education Completers
Research Brief

Bob Vanderheyden

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RESEARCH BRIEF

January 1994 No. 1994-02

A Publication of the Planning and Research Section, N.C. Dept. of Community Colleges

EARNINGS OF COMMUNITY COLLEGE STUDENTS BEFORE ENROLLING

The adoption of a new mission and goals statement for the North Carolina Community College System (October 14, 1993) reemphasized community college efforts on workforce preparedness and literacy in support of a "Sterling Silver" workforce for the state of North Carolina. Consequently, input and outcome measures of workforce preparedness and literacy are needed to document the success of community college efforts in support of these components of the overall system mission and goals.

While workforce preparedness and literacy have always been an inherent part of the mission of community colleges in North Carolina, measurement of outcomes of workforce preparedness has been difficult. Two outcome measures of successful workforce training are employment rates and median salary of program completers. This paper will examine the median earnings of first time freshmen in North Carolina community colleges.

Measuring the impact of a community college on median earnings of former students would require a "control" group to make comparisons. The ideal control group would be the group of high school graduates with similar demographic characteristics to the completers studied. This control group is necessary since factors such as time in the workforce, parental income, and access to training may have a significant impact on an individual's earnings.

At the current time, data on a control group as described above are not available. This report will simply document income levels of the entering cohort of new freshmen for the 1991-92 academic year and attempt to establish the general correlation of income to age.

The Data:

As the result of many years of work by the North Carolina State Occupational Information Coordinating Committee, new data regarding employment of current and former North Carolina community college students are now available for analysis. These data collection efforts parallel similar efforts in the state of Florida. The data are derived from matching student identifiers with the North Carolina Unemployment Insurance (UI) file maintained by the North Carolina Employment Security Commission (ESC).

The data available include eight quarters of earnings, ESC information such as filing and registration dates and employer names and addresses. In addition, cross matches can be made with other federal and state governmental agencies participating in the project, including North Carolina Division of Employment and Training, Department of Public Instruction, Department of Labor, Department of Social Services, and Vocational Rehabilitation Services and the United States Department of Defense.

The students in the cohort examined were new freshmen in a North Carolina community college enrolling in the fall, winter or spring quarter of the 1991-92 academic year.

The ESC retains earnings data for eight fiscal quarters. The data used in this analysis begin with the fourth quarter of 1990 (October 1, 1990 through December 31, 1990) and end with the third quarter of 1992 (July 1, 1992 through September 30, 1992). Therefore, three fiscal quarters of pre-enrollment earnings data are available for the cohort studied and an additional fiscal quarter of information is available on new freshmen enrolling in the winter or spring academic quarters. These data represent over 18,500 students per fiscal quarter.

An additional limitation of the database is that the database does not indicate whether employment is part or full time. Consequently, the values reported will underestimate full-time median salaries.

Methodology:

The data used for this brief come from the collaborative efforts mentioned above. The students in the cohort studied completed their program during the 1991-92 academic year. The specific data elements that are used are:

> Quarterly earnings for the most recent eight quarters[1]
> that were available in mid-March of 1993,

For the purpose of this paper, measures for each quarter are calculated independently of the other seven quarters. This methodology parallels traditional calculations of employment measures.

Due to the nature of the data collected, people who were self-employed, employed as an unpaid worker in a family owned business, or employed by the railroad are not included in the analysis. The earnings data on these people are not available since Unemployment Insurance is not paid on earnings for these people.

Results:

As can be seen in Table 1, the median income, prior to enrollment, of new students for the 1991-92 academic year is below $2,500 for each of the four quarters. The variances in median income levels between quarters can be attributed to quarterly business cycles.

TABLE 1
QUARTERLY EARNINGS BEFORE ENROLLMENT
OF 1991-92 FIRST TIME CURRICULUM STUDENTS BY YEAR-QUARTER

Year- Quarter[2]	Number	Median
1990- Fourth	25,687	$2,418
1991- First	25,285	$2,366
1991- Second	26,679	$2,319
1991- Third	18,950	$2,348

[1] The fourth quarter of 1990 thrugh the third quarter of 1992.

[2] An annual inflation rate of three percent was used to adjust earnings in the first year.

As stated in the introduction, a considerable amount of research has been done to document the relationship between age and earnings. As a general rule, as experience in the workforce (which can generally be measured by age) increases, so does earnings.

To control for erroneous results due to extreme values, the individuals in the cohort studied during this phase of analysis were between 18 and 50 years of age. When we calculated the Pearson Correlation Coefficient, which attempts to measure such a relationship, we found that for the students in the cohort, there was no impact of age on earnings[3]. This could be an indicator that the students who choose to enroll in community college programs have experienced some sort of ceiling on earnings.

Since these students elect to attend a community college, the above results do not indicate a contradiction to previous studies. Instead, the results do support the widely accepted premise that students enroll in community colleges to gain skills to obtain a better paying job.

A follow-up paper will use the results of this paper and a related previous paper in an attempt to measure the gain due to the completion of the program. The discussion of the assumptions and conditions necessary to make such a comparison are beyond the scope of this paper.

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[3] The Pearson Correlation Coefficients for all four quarters were between 0 and 0.004 (p greater than 0.6).

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RESEARCH BRIEF

January 1994 No. 1994-03

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IMPACT OF COMMUNITY COLLEGE PROGRAM COMPLETION ON MEDIAN EARNINGS

Central to the mission of North Carolina community colleges is workforce preparedness. An important measure of the effectiveness of colleges in training individuals for better jobs is the increase in earnings experienced by program completers. This paper is the third in a series[1] that attempts to address the impact of North Carolina community college programs on completers earnings.

The data used in this study are eight quarters of earnings for students enrolled in a community college curriculum program in either the 1990-91 or 1991-92 academic years. The eight fiscal quarters for which these data are available are the fourth quarter of 1990 through the third quarter of 1992[2].

These data are the result of several years of work by the North Carolina State Occupational Information Coordinating Committee to obtain information from the Unemployment Insurance files maintained by the Employment Security Commission. What follows is a preliminary attempt to gain insight into the income patterns of completers of North Carolina community college programs.

In the first paper, titled "Employment of Community College Completers," quarterly employment patterns and median earnings for individuals completing North Carolina community college curriculum programs during the 1990-91 academic year were reported. As can be seen in Table 1, this information included median earnings for the fourth quarter of 1991 through the third quarter of 1992. These earnings figures are of interest since they represent post-completion earnings for all of the individuals in the 1990-91 cohort for whom earnings data are available.

The second paper, titled "Earnings of Community College Students Before Enrolling," reported the median adjusted[3] earnings of new freshmen students who enrolled in the 1991-92 academic year. As can be seen in Table 2, this information included adjusted earnings for the fourth quarter of 1990 through the third quarter of 1991. These figures represent earnings prior to enrollment for the 1991-92 cohort of new freshmen students for those students who had reported earnings.

An important finding from the second paper is the lack of influence of age on income for new freshmen. This result implies that, in general, these students should not expect a change in real income unless they experience a significant change in skills or opportunity.

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[1] For additional background information, please read the first two papers in this series titled "Employment of Community College Completers" and "Earnings of Community College Students Before Enrolling."

[2] October 1, 1990 through September 30, 1992.

[3] The earnings figures were adjusted for three percent inflation.

TABLE 1
MEDIAN QUARTERLY EARNINGS OF 1990-91 COMPLETERS BY YEAR-QUARTER

Year-Quarter[4]	Number	Median
1991- Fourth	11,901	$4,026
1992- First	11,631	$3,979
1992- Second	11,976	$4,079
1992- Third	11,808	$4,279

TABLE 2
MEDIAN QUARTERLY EARNINGS BEFORE ENROLLMENT OF 1991-92 FIRST TIME CURRICULUM STUDENTS BY YEAR-QUARTER

Year-Quarter[5]	Number	Median
1990- Fourth	25,687	$2,418
1991- First	25,285	$2,366
1991- Second	26,679	$2,319
1991- Third	18,950	$2,356

The next step in the analysis of earnings data is to compare the quarters in one year of earnings prior to enrollment in a community college program with like quarters of the year following program completion. While this may be a logical step, the following data issues must be addressed before such a comparison can be made.

1. The different tables represent different groups (cohorts) of students.
   a. The proportion of full-time versus part-time employment is likely to differ somewhat between cohorts.
   b. The mix of student occupations is likely to differ between cohorts.

2. The tables represent different time periods, and therefore, economic forces that impact earnings in an unusual fashion may be present.

[4] An annual inflation rate of three percent was used to adjust earnings in the first year.

[5] An annual inflation rate of three percent was used to adjust earnings in the first year.

In the first paper, the 1990-91 completers were assumed to be representative of community college completers for any given year. In other words, there is nothing different or unusual about the 1990-91 completers that would result in their earnings being unusually high or low if compared to completers for other years. In a similar fashion, the pre-enrollment earnings of the 1991-92 new freshmen were assumed to be representative of earnings for new freshmen of other years. This does not imply that the proportion of individuals in each cohort that were working full time were the same nor that the mix of occupations in which students were employed were the same.

Traditionally, to make a comparison of earnings for two different groups of individuals, the researcher must control for the influence of differences in proportion of full-time employment between the groups as well as the differences in occupational choice between the two groups. However, the most significant impact of a community college's programs may be the increased opportunities for career choice and availability of full-time employment that completers experience. Therefore, it will be assumed that any such differences will be due to the training received at the community college.

Another factor that may cause differences in earnings between groups of individuals is the possible presence of "personality" traits that may be more prevalent in one group than another. An example of this type of factor could be characterized as career motivation.

If the individuals who complete programs are more career oriented (than the entering cohort), they may be willing to work longer hours and strive for career advancement and therefore have higher earnings. The fact that these individuals completed a program may be an indicator of this type of personality trait. At the present time, data to measure the existence of some sort of inherent personality difference do not exist. In the future, the 1991-92 cohort, for whom pre-enrollment data exist, can be tracked and as a group their post-completion earnings can be compared to their pre-enrollment earnings. This will control for the "personality effect" that may exist.

A third factor that could have an impact on earnings is a significant change, either positive or negative, in the state's economy during the time period examined. As can be seen in Table 3, median family earnings in North Carolina increased 1.1 percent from 1991 to 1992. In comparison, the 5.0 percent increase from 1990 to 1991 is larger, but not large enough to invalidate the assumption that increases found in students' earnings were the result of some factor other than a general change in the state's economy.

TABLE 3
MEDIAN FAMILY INCOME FOR NORTH CAROLINA[6]

Year	Income	% Change
1990	$32,400	
1991	$34,000	5.0
1992	$34,400	1.2

[6]Source: U.S. Department of Human and Urban Development.

With these basic assumptions in mind, differences in the adjusted pre-enrollment earnings of new freshmen for 1991-92 and the post-completion earnings for completers in 1990-91 are valid measures of impact of community college programs.

As can be seen in Table 4, the median income of completers is over $1,600 per quarter greater than that for entering new freshmen with reported prior earnings, even when controlling for inflation. Since individuals without training should not expect an increase in real income, the representative individual, whose earnings equal the median for each of the eight quarters in Table 4, would experience an annual income increase of more than $6,400.

If this representative individual were to remain in the chosen career field for thirty years[7] and were to be employed for all of that time, a projected life-time increase in earnings would be over $192,000. Note, this projection is based on a average difference of $1,600. The data indicate that the difference in real earnings is increasing over time. If the difference in earnings were projected to increase over the next several years, the projected life-time increase would be considerably larger.

TABLE 4
MEDIAN QUARTERLY POST-COMPLETION EARNINGS
VERSUS
ADJUSTED MEDIAN QUARTERLY PRE-ENROLLMENT EARNINGS

	Post-Completion	Pre-Enrollment	Difference
Fourth Quarter	$4,026	$2,418	$1,608
First Quarter	$3,979	$2,366	$1,613
Second Quarter	$4,079	$2,319	$1,760
Third Quarter	$4,279	$2,356	$1,923

As data collection efforts continue, studies comparing post-completion earnings with the same groups pre-enrollment earnings will be possible. Additional studies may include an examination of earnings changes of non-completers and the long range impact of completion on an individual's earnings.

[7] Assuming a 30 years of employment for the average community college student who is 30 years of age.

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RESEARCH BRIEF

May 1994 No. 1994-05

A Publication of the Planning and Research Section, N.C. Dept. of Community Colleges

FIRST YEAR EARNINGS OF PUBLIC POSTSECONDARY EDUCATION COMPLETERS

During the past five months, the Planning and Research Section of the North Carolina Department of Community Colleges published three reports that document the financial returns to a community college education. The reports simply looked at quarterly earnings of community college graduates for one year after graduation. In this study, annual earnings of completers of all public higher education degree programs, by type of degree, will be examined to determine the relative worth of graduation from a two-year associate of applied science (AAS) degree program.

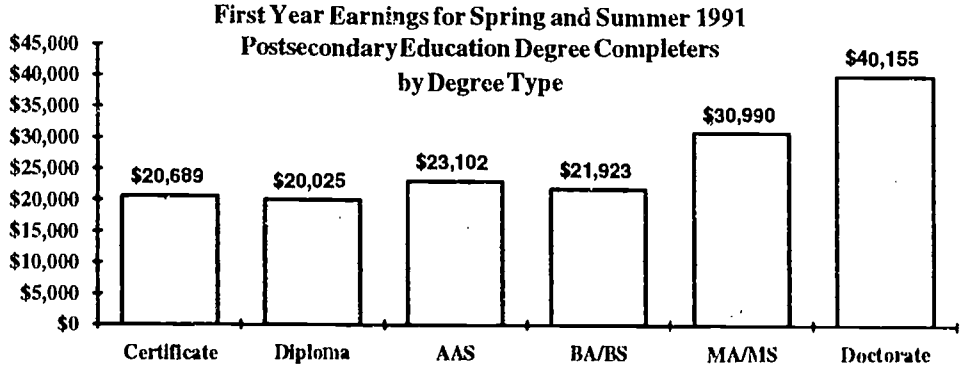
A study such as the one proposed above has been conducted in the state of Florida. In a recent report published in the state of Florida[1], students who had completed an associate of science[2] degree at a public Florida community college were reported to have had higher earnings their first fiscal quarter after degree completion than their bachelor degree counterparts from the state's university system.

Earnings of graduates were obtained by matching public community college and university records with the unemployment insurance quarterly earnings files maintained by the North Carolina Employment Security Commission. Note that this methodology will not include earnings outside the state of North Carolina.

Earnings can be expected to fluctuate from quarter to quarter due to a number of reasons such as short-term unemployment, underemployment, part-time employment, training and education, moonlighting, overtime, etc. Therefore, annual earnings are a more appropriate measure. In this study, the researchers will report earnings on former students who had earnings of at least $2,040[3] per quarter in each of the four fiscal quarters following their program completion.

As can be seen in Table 1, former North Carolina community college students who completed an AAS degree in either the spring or summer quarters of 1991 had higher first year earnings than corresponding University of North Carolina bachelor degree recipients.

Table 1



[1]The information was presented in a newsletter article "Information in Action" contributed by Jay Pfeiffer.

[2]The associate of applied science degree in the North Carolina Community College System is equivalent to the associate of science degree in the Florida system. Both degrees are awarded for technical programs that are intended to prepare a student for the work place and in some instances can be used to transfer to a four-year institution.

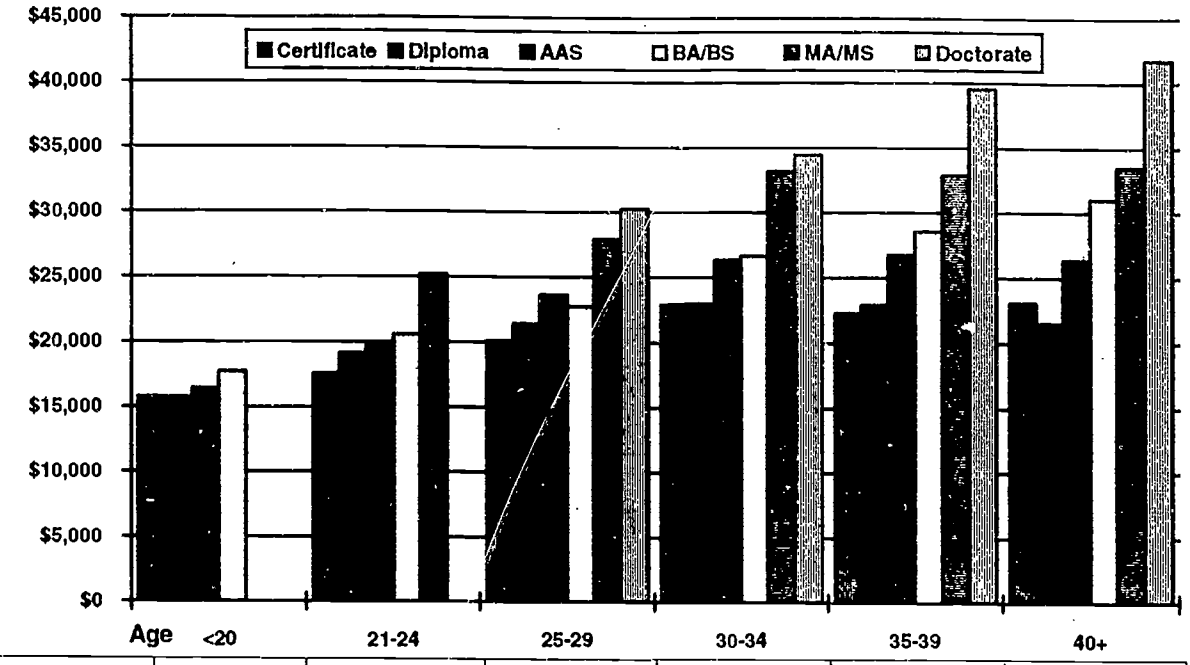
[3]This figure was used since an individual who worked 40 hours per week for 12 weeks of the quarter at the minimum wage rate of $4.50/hr would earn $2,040 per quarter.

However, due to differences in student populations, this representation can be misleading. The study conducted by the researchers in Florida neglected to account for the very real differences in the average age of students enrolled in the two higher education systems. Community college students tend to be older than their counterparts enrolled in the public university system. As a general rule, older individuals tend to have more work experience which will usually result in higher earnings. Therefore, a more appropriate methodology for a study such as this would be to examine earnings by age. To simplify reporting, age clusters are used in this study.

As can be seen in Table 2, bachelor degree recipients earn more than their AAS degree counterparts in all but one age category. The apparently conflicting results, from the two tables, are due to the differences in the proportions of students in each of the different age categories. Over 70 percent of the bachelor degree recipients are under 25 while over 60 percent of the AAS degree recipients are 25 or older which leads to the two apparently different results.

Table 2

First Year Earnings for Spring and Summer 1991
Postsecondary Education Degree Completers
by Age and Degree Type



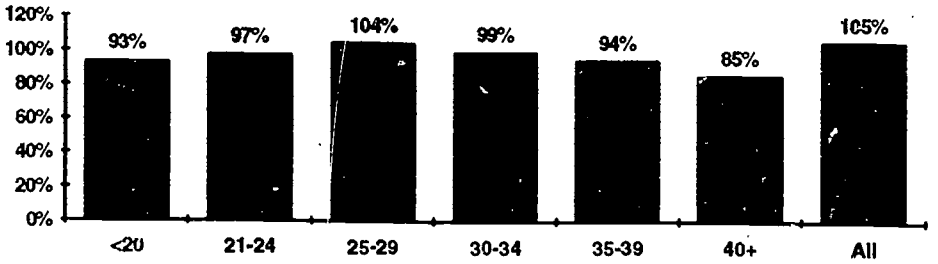
Certificate	15,760	17,578	20,076	22,910	22,306	23,125
Diploma	15,752	19,100	21,414	22,945	22,903	2[illegible],537
AAS	16,391	19,996	23,649	26,300	26,781	26,383
BA/BS	17,6[illegible]4	20,569	22,763	26,675	28,554	31,034
MA/MS		25,188	27,943	33,245	32,921	33,582
Doctorate			30,247	34,498	39,592	41,794

As can also be seen in Table 2, the AAS degree recipients trail their bachelor degree counterparts by only a small margin. This situation is better depicted in Table 3 where the AAS degree earnings are expressed as a percentage of bachelor degree earnings. In each age category, the difference is less than 15 percent and in all but one category the difference is seven percent or less. In fact, in the 21 to 24 years of age category, which constitutes a large majority of the UNC BA/BS completers, the average first year earnings of AAS degree completers was 97 percent of the BA/BS average. While the average earnings

of 25 to 34 year olds with AAS degrees (32 percent of all AAS degree completers studied) exceeds those of the UNC BA/ BS degree receipients. This last category is important to community college administrators since it represents the population of community college students who enroll for retraining and represents 36 percent of the AAS completers studied.

Table 3

First Year Earnings of NCCCS[4] Associate of Applied Science Degree as a Percentage of UNC[5] Bachelor's Degree Earnings



Spring and Summer 1991 Postsecondary Education Degree Completers

These results help confirm the value of the completion of a community college program. Longitudinal studies are planned to attempt to document the long range effects of postsecondary education. Additional studies are currently being conducted to document the pre-enrollment earnings of community college students as well as the earnings of individuals who do not complete programs. The results of these studies will help in the planning of educational objectives within the community college system as well as the state.

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