

How Noncredit Enrollments Distort Community College IPEDS Data: An Eight-State Study

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Abstract

A commonly used metric for measuring college costs, drawn from data in the Integrated Postsecondary Education Data System (IPEDS), is expenditure per full-time equivalent (FTE) student. This article discusses an error in this per FTE calculation when using IPEDS data, especially with regard to community colleges. The problem is that expenditures for noncredit courses are reported to IPEDS but enrollments are not. This exclusion inflates any per FTE student figure

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calculated from IPEDS, in particular expenditures and revenues. A 2021 IPEDS Technical Review Panel (TRP #62) acknowledged this problem and moved campus institutional research offices a step closer to reporting noncredit enrollment data (RTI International, 2021). This article is the first to provide some numbers on the magnitude of this problem. It covers eight states—California, Iowa, New Jersey, New York, North Carolina, South Carolina, Tennessee, and Virginia. Data on noncredit community college enrollments were made available from system offices in all states. In addition, discussions were held at both the system level and the campus level to verify the data and assumptions. Figures provided by states were merged with existing IPEDS data at the campus and state levels, and then were adjusted to account for noncredit enrollments. The results provide evidence that calculations using IPEDS data alone overestimate the resources that community colleges have to spend on each student, although distortions vary greatly between states and among colleges in the same state. The results have important implications for research studies and college benchmarking.

Keywords: community college spending, noncredit enrollments, IPEDS

INTRODUCTION

This study builds on previous research explaining how noncredit enrollments impact Integrated Postsecondary Education Data System (IPEDS) data, particularly how they impact community colleges. The earlier study covered the states of California, New Jersey, New York, and North Carolina (Romano et al., 2019). The current study adds the states of

Iowa, South Carolina, Tennessee, and Virginia, using the same methodology. A target year of 2012–2013 was used in both studies to provide continuity, and Table 1, which is presented in the Results section of this article, integrates the major findings from all eight states. This target year was judged to be a more-or-less normal year for funding and enrollments, since it occurred before the pandemic but after the economic downturn of 2007–2009. Even though funding for public higher education had recovered somewhat from that downturn by 2012, public higher education kept up the claim that it was underfunded.

Backing up this claim, community college advocates often pointed to the amount colleges spend on each student compared to what is spent by their 4-year public counterparts. Thus, for our target year of 2012–2013 the national average for public research universities was \$39,793 per full-time equivalent (FTE) student, \$19,310 per FTE student for public master's colleges, and \$14,090 per FTE student for public community colleges. These figures are taken from the IPEDS, which is the most widely used source of data on postsecondary education in the United States. Each year, the US Department of Education collects these data from all colleges that wish to be eligible for federal funding, such as Pell Grants and student loans.

Almost all studies of comparable spending levels use data from IPEDS and lead to the same conclusion: community colleges serve the neediest students but have the least to spend on them (Hillman, 2020). The current study is not designed to argue this point; for a review of this issue, see Romano and Palmer (2016). Our objective is to show that the expenditures per FTE figures can be inaccurate and are actually lower than those found when strictly using IPEDS data, especially for the community

college sector. The same can be said of revenues per FTE, but we focus exclusively on expenditures because they more accurately measure what it costs colleges to educate students. For the difference between costs and prices and what drives each, see Feldman and Romano (2019).

Colleges have invested considerable resources in collecting, reporting, and analyzing IPEDS data. If comparisons and claims are to be made in regard to outcomes, funding, and policy, it is important that the figures are accurately measured—or, at the very least, that they are contextualized to communicate their shortcomings.

DEFINING NONCREDIT

Our definition of noncredit follows that of the National Center for Education Statistics (NCES, 2021), which defines noncredit courses as those “having no credit applicable toward a degree, diploma, certificate, or other recognized postsecondary credential” (p. 27). Based on this definition, noncredit enrollments are not reported to IPEDS as part of the annual reporting requirements; however, the revenue and expenditures for those courses are included in college budgets and, thus, are reported to IPEDS (Erwin, 2020). It is important to note that the two reporting stipulations (first, that enrollments are not reported, but second, that their expenses are reported) are critical elements underpinning this study.

Noncredit courses are often short in length and may be offered through a division of continuing education either on or off campus. Most often designed for workforce training or to meet various community demands, they cover a wide range of

topics from ballroom dancing to truck driving, health care, and manufacturing, depending on local area needs.

One major difficulty in isolating credit from noncredit offerings in state and college databases centers on English as a Second Language (ESL) and remedial/developmental education courses. The precollege courses offered by regular academic departments are not usually part of degree programs; however, they carry institutional credit and may be counted for the purposes of financial aid. This is allowed under federal regulations. In these cases, courses are reported to IPEDS and do not fit our definition of noncredit. Similar conditions exist for some ESL classes. Thus, when Voorhees and Milam (2005), for instance, found that, in public 2-year colleges, 24% of noncredit enrollment is in remedial studies, 25% is in recreational courses, and 52% is in career and technical training, no clear distinction is made between those courses that were reported to IPEDS and those that were not reported.

Additional, more-recent efforts have occurred to define noncredit types. Using an established typology for noncredit community college education (D’Amico et al., 2014), D’Amico et al. (2020) identified enrollment patterns and selected outcomes for community college noncredit programs in the state of Iowa. Their noncredit course clusters and the percentage of students enrolled in 2016–2017 were occupational training (64.3%), personal interest (17.0%), contract occupational training (9.7%), and precollege remediation including adult, secondary, and developmental education (9.0%).

These findings differed from a previous analysis of 33 states that had nearly equal splits of occupational, sponsored occupational, and

precollege education (28%, 29%, and 28%, respectively), as well as personal interest (11%) (D'Amico et al., 2017). Seeing the differences between one state's distribution and a broader sample, one of those authors' conclusions was that noncredit offerings are mission driven, state and/or institution specific, and may reflect the focus of the credit programs. The data and conclusions from this study helped frame our thinking for the current study—not only for the state of Iowa but, as it turned out, for all of the states in our analysis.

It is not unusual for colleges to point out that enrollments in noncredit programs are higher than those in credit programs. On a national level, this does not appear to be the case. The American Association of Community Colleges (AACC) estimates that, in the fall of 2019, 5 million out of 11.8 million (42%) enrollments were in noncredit courses (AACC, 2021). The number of FTEs is unknown but is surely much lower because most, if not all, of these courses have fewer contact hours than a typical credit course. For instance, an early study of this issue using Wisconsin state data by Grubb et al. (2003) found that a 264,320 headcount of noncredit enrollments turned into only 4,225 FTEs. In the present study, in Iowa an enrollment of about the same number as in Wisconsin, 248,440, generated 7,581,717 contact hours, which resulted in an FTE count of 12,636 in 2012–2013. For our purposes, the FTE count is the important figure, and contact hours, not headcount enrollments, are what are needed for accurate and consistent calculations.

PREVIOUS RESEARCH

Noncredit activity has attracted a modest amount of interest among scholars, largely because the community college workforce development mission is delivered, in part, through this mode. Most of these studies have been done on the type of noncredit offerings at community colleges, methods of funding, the characteristics of the students taking such courses, and selected outcomes (e.g., D'Amico et al., 2014; D'Amico et al., 2017; Van Noy et al., 2008; Xu & Ran, 2015). All of these studies provide important information on noncredit courses, but none addresses the measurement problem found in the line of research that we are developing.

Reclassification Problem

An important study of a measurement problem within IPEDS is of particular interest to us. It was done by the Community College Research Center (CCRC) at Teachers College, Columbia University. In this study, Fink and Jenkins (2020) found an undercounting problem due to the reclassification of some community colleges as 4-year colleges once they had begun to offer bachelor's degrees.

The result is an undercounting of the number of community colleges nationally, and therefore an undercounting of community college students. This especially affects the states of Florida, where 27 colleges were eliminated; Washington, which lost 26 colleges; and California, which lost 15 colleges. The reclassification results in a significant problem with calculating the overall reach of community colleges. From 2000 to 2017, 95 colleges and 1.4 million students (2016–2017) were reclassified even though the number of bachelor's degrees awarded by these colleges is very small and they are widely considered to be community colleges by their states.

In the state of Florida, for instance, only one of the 28 two-year public colleges is currently classified as a community college in IPEDS. Because of this reclassification, the number of FTEs recorded for the state in NCEES data fell from 173,433 in 2000 to 16,516 in 2017. As the authors point out, “Studies that rely on the IPEDS ‘public two-year’ sector definition undercount these institutions and provide a misleading picture of community colleges in many states and nationally” (Fink & Jenkins, 2020, para. 3).

In order to estimate the extent of undercounting, the CCRC used IPEDS data to develop a new dataset of public 2-year colleges that includes institutions that are generally recognized as community colleges by the AACC and state systems. This dataset has been shared with us and is a major source of information for the present study. It is discussed further in the Sources of Data and Methods section in this article.

Prior Recognition of Per FTE Undercounting Problem

Another major study of an undercounting problem within IPEDS concerns the undercounting of enrollments from noncredit programs and therefore the calculation of an inaccurate spending per FTE figure for community colleges (Romano et al., 2019). The current study builds on this previous research, which covered the states of California, New Jersey, New York (City University of New York [CUNY] and State University of New York [SUNY]), and North Carolina. In these five state systems, the authors estimated that mean state college expenditures per FTE (2012–2013) were overestimated when using IPEDS data alone by \$1,031 for California, by \$913 for New Jersey, by \$3,492 for New York (CUNY), by \$487 for New York (SUNY), and by \$3,710 for North Carolina.

We have used a target date of 2012–2013 for the current study so that the findings may be more easily integrated with the previous one (Romano et al., 2019). An integration of the results can be found in the Results section and in Table 1, both in this article.

It is not that the undercounting problem under study has not been recognized. Baum and Kurose (2013) pointed out that “a major problem with [IPEDS] data is that the counts of students include only those registered for credit . . . [, which] biases [community college] revenues and expenditures upward relative to those computed for four-year institutions” (p. 80).

A study undertaken for the National Postsecondary Education Cooperative by Kolbe and Kelchen (2017) also stated the problem very clearly: “Providing finance data separately or otherwise accounting for non-credit students (such as those enrolled in continuing education or certain types of remedial coursework) would create a more accurate expenditure metric than pre [*sic*] -FTE metrics that are only based on credit-bearing courses” (p. 16). Two recent IPEDS Technical Review Panels (TRPs) have been convened on the matter. The first in 2008 (TRP #22) noted the problem of not including noncredit enrollments in the denominator of expenditure calculations (RTI International, 2008, p. 2) and recommended that noncredit enrollments be included in the future; however, the recommendations were not implemented. The second, issued in 2021 (TRP #62), restated the problem, invited public comments, and noted that the undercounting problem affected “most often 2-year public institutions” (RTI International, 2021, p. 2). TRP #62 provides a sign that we are getting closer to measuring this type of activity.

The second, TRP #62, heavily referenced a report on how noncredit data could be collected on the IPEDS survey. This report noted that “the exclusion of noncredit enrollment from IPEDS has a negative effect on the quality of IPEDS data, specifically the calculation of per FTE student ratios” (Erwin, 2020, p. 27). It also acknowledges the importance of the findings that the current study is built on:

In 2019, Romano, Kirshstein, D’Amico, Hom, and Van Noy conducted a study to assess the effect of the mismatched coverages of enrollment and finance components. They concluded that “the addition of noncredit FTEs reduces what would typically be reported as expenditure per FTE student,” but that “there is a significant difference between the states in the study” (p. 13). Their findings suggest that the issue related to the calculation of per FTE student revenue and expense ratios identified by TRP #22 is valid and remains unresolved. (Erwin, 2020, pp. 8–9).

Considering the recognition of this noncredit undercounting problem, our research seeks to build a more complete picture of the measurement problem and of the nature of college costs in general.

SOURCES OF DATA AND METHODS

Our data come from two sources: IPEDS, and state system offices that collect data from individual colleges on noncredit enrollments. Since there are no national data on noncredit enrollments, it is left to the states to collect them. But the states that collect those data do so with varying definitions and coverage. Culling state-level databases for only the noncredit courses that fit our definition was a necessary part of our study. In addition,

structured campus and/or system communications and searches of campus and system websites were important sources of information in each state.

IPEDS Data

IPEDS is our source of information on college expenditures and FTE credit enrollments. In the previous study of California, New Jersey, New York, and North Carolina, researchers used a compilation of the IPEDS data produced by the Delta Cost Project (DCP). In particular, they used the DCP online dataset found in *Trends in College Spending* (Desrochers & Hurlburt, 2016). This online tool, which is no longer available, covered the years from 1987 to 2015. It was valuable because it allowed researchers to match college noncredit data obtained from the states with the colleges reporting to IPEDS (the two lists of colleges were not always the same).

The DCP data that we need, however, have been replaced and updated to the year 2018 by the CCRC for the study by Fink and Jenkins (2020) mentioned above. This dataset, hereafter referred to as CCRC/IPEDS, has been made available for the current study. It contains information from 2000 to 2018 on FTE enrollments, expenditures, sources of revenues, and selected outcomes of all of the community colleges in the states that are part of this study.

The colleges in the CCRC/IPEDS dataset are a limiting factor in the present study. If the college is not listed it is not included. This did not prove to be a problem because the lists of college noncredit contact hours provided by the states were easy to match with those taken from IPEDS, although 3 of the possible 67 colleges had to be eliminated due to either lack of data or conflicting data.

State Data

The system offices in each of the states in the present study provided the data by college on enrollments and noncredit student contact hours for as many of the recent years after 2000 that they had. Only Iowa converted these contact hours into FTEs, which is a necessary part of the current study. In Iowa they divided the number of contact hours by a standard divisor to get the FTE count. The divisor used was 600 in Iowa, but the most common divisor that has been found in other states is 450, so that became the default divisor for our study. In our previous work, Romano et al. (2019) found that a divisor of 450 was the most common but that 525 was used in California. In the current study, South Carolina, Tennessee, and Virginia did not specify a divisor, so we used 450. In calculating the noncredit FTE, we used the divisor preferred by the state, but the choice of the divisor can have a large effect on the results; see, for instance, the example of Iowa in Table 1 (in the Results section).

The 450 figure is based on the calculation used in credit courses. The number assumes that a full-time student in credit courses attends 15 hours of class a week, that there are 15 weeks in a semester, and there are two semesters a year, so $15 \times 15 \times 2 = 450$ contact hours = 1 FTE. California uses a 17.5-week semester so for that state we calculate $15 \times 17.5 \times 2 = 525$ hours = 1 FTE. Tennessee uses 900 for its technical colleges (not included in this study), and this divisor is mostly for non-classroom instruction. If IPEDS were to require the reporting of noncredit contact hours at some point, it will be necessary to address the divisor issue.

Also, in each of the eight states found in Table 1, the fact that expenditures and revenues from noncredit contact hours were included in college budgets and

reported to IPEDS was verified by state systems offices, by campus interviews, and by looking at the budgets on selected campuses.

In the Results section that follows, the sources of our data and methods used are presented for each of the four new states in the current study. Methods of calculating some of the data are deferred to this section, where they can be more closely followed. Where possible, brief comparisons are made between noncredit and credit enrollments in years other than our target year of 2012–2013.

RESULTS

Table 1 displays a summary of the most important findings of our study. That is, that IPEDS per FTE calculations are inflated by the exclusion of noncredit enrollments. For comparative purposes, we have included the results from the previous study; that study covered different states but produced similar results. The methods used in both studies were identical. The details of the previous study will not be repeated here, save a brief mention in the discussion below.

To move from the official IPEDS data to the adjusted figure in Table 1, we converted the noncredit contact hours provided by the state system office into noncredit FTEs using the divisors specified previously. Noncredit FTEs were then added to the IPEDS credit FTEs of the same academic year and the total was divided into the expenditure figures to obtain the adjusted expenditures/FTE figure for each college using the Consumer Price Index configured to the academic year. Colleges were then summed to obtain the state average.

Table 1. Summary of the Impact of Community College Noncredit Courses on IPEDS Expenditures per FTE (2012–2013 dollars)

State (System) Current and Previous Study	Mean Expenditures/FTE (IPEDS)	Noncredit FTEs as % of credit FTEs	Mean Adjusted Expenditures/FTE	Difference
Iowa-1	\$12,401	18.9%	\$10,364	(\$2,037) 16.4%
Iowa-2	\$12,401	25.2%	\$9,445	(\$2,956) 23.8%
South Carolina	\$12,855	9.5%	\$11,771	(\$1,084) 8.4%
Tennessee*	\$11,784	3.02% (3.3)	\$11,448	(\$336) 2.9%
Virginia	\$11,463	6.7%	\$10,764	(\$699) 6.1%
Previous Study (Romano et al., 2019)				
New York (SUNY)	\$12,495	4.1%	\$12,008	(\$487) 3.9%
New York (CUNY)	\$15,971	28.0%	\$12,479	(\$3,492) 21.9%
California	\$12,811	6.1%	\$11,780	(\$1,031) 8.0%
North Carolina	\$14,726	27.6%	\$11,016	(\$3,710) 25.2%
New Jersey	\$10,949	9.1%	\$10,036	(\$913) 8.3%

Note: * Workforce only. Iowa-1 Contact hours are divided by 600, the way the state does it. Iowa-2 contact hours are divided by 450, the way New Jersey, New York, and North Carolina do it. We used a divisor of 450 for South Carolina, Tennessee, and Virginia. The Tennessee ratio, and adjusted IPEDS numbers, are based on the workforce training hours provided by the state. The 3.3% for Tennessee is the state estimate if non-workforce courses are included.

As Table 1 shows, the inclusion of noncredit enrollments deflates the official IPEDS data. The percentage figure for each state and/or system in the difference column shows the percentage reduction in the IPEDS data that is necessary to get to the “real” adjusted figure. Community colleges spend less per FTE student than when compared with figures calculated with IPEDS data alone, but there are great variations among states.

In general, the larger colleges in each state generate more noncredit enrollments but the story may be different when adjusted for size. The noncredit-to-credit ratio, expressed as a percentage, is an easy way to estimate this relative measure. On this measure the leaders are New York (CUNY), and the state systems in Iowa and North Carolina. The lowest ratios are found in Tennessee and New York (SUNY). Higher ratios generate greater distortions in the

IPEDS data but there is also a range of differences within each state.

The previous study collected data for only the target year, 2012–2013. For the current study we had noncredit contact hours and FTEs for a number of years. This allowed us to see that the variation from year to year for most colleges, and certainly for the state, was much greater than the variation in credit FTEs. It also gave us some faith that our target year of 2012–2013, was more “normal” than some of the other years. Some of the variation from year to year might be related to the business cycle but a lot of it reflects new or lost contracts, competition from other vendors for the same market, or changes in state policy that impact noncredit offerings. All of these things can affect credit market as well, but have a greater impact on noncredit offerings.

The following is a brief discussion of the differences found in each state within the current study, along with additional information found within the data but not displayed in Table 1. We also provide a few educated guesses on what might account for some of the differences between the states, many of them derived from campus/system interviews.

Iowa

The state of Iowa is divided into 15 community college districts; 11 of the 15 are rural colleges with a median FTE credit enrollment of 2,651 in our target year of 2012–2013. Detailed records on noncredit enrollments, as well as contact hours at the college level and by topic, were provided by the Iowa Department of Education. A structured interview was conducted at both the system and college levels to verify data received from the state and to answer questions that the data could not answer.

Noncredit enrollment data for the three public 4-year colleges in the state were also obtained from the Iowa Board of Regents for comparative purposes. For the three public universities—Iowa State University, University of Northern Iowa, and University of Iowa—the noncredit enrollments for 2018–2019 were 655,310, while total enrollments at the 15 community colleges for that year were 204,233. The surprising finding is that public 4-year colleges had three times the enrollment in noncredit courses. Table 2 shows some expansion of this idea.

As Table 1 shows, we estimate that, in our target year of 2012–2013, the official IPEDS expenditure of \$12,401 is inflated by \$2,000 to \$3,000, depending on which divisor is used. Among the individual colleges, the largest, as measured by credit FTEs, is Des Moines Area Community College. It has the

greatest number of noncredit FTEs (2,238), but its noncredit-to-credit ratio is only 16.5%. A college about a third as large, Eastern Iowa Community College, has a ratio of 27.6%. The statewide range on this measurement is 6.2% to 27.6%, so there is considerable difference among colleges.

Looking at credit enrollments from 2000 to 2017 for the system of community colleges, we see a steady climb, with a few minor interruptions from 2000 to 2009, with an upward surge due to the recession of 2007–2009, and after that a steady decline to 2017. This follows national patterns.

The pattern for noncredit courses—whether measured by enrollments, contact hours, or FTEs—is quite different. Here we see a steady decline from 2000 to 2019, with only two up years: 2007 and 2016. The statewide FTE count in 2000 of 20,543 fell to 9,927 in 2019, a decline of 52%. Campus interviews indicate that increased competition from other public and private providers had contributed to the decline in noncredit enrollments. State figures show large declines in areas, which can be read as positives. Fewer drunk drivers, less need for secondary education, and more college academic success courses are all good signs but lead to reduced need for those services. Perhaps the generally expanding economy and improved education upgrades reduced the demand for these courses. However, this would not explain the decrease in enrollments for leisure or recreational courses.

Nevertheless, the noncredit numbers for Iowa remain the highest in our sample. It is not difficult to see why, since the state has provided generous support for these programs, including need-based student aid, which can cover the full cost of

attendance for workforce courses that the state prioritizes. In 2020–2021, for instance, Kirkwood Community College had more than \$1 million for this purpose. This high degree of state support for noncredit offerings contributes to the impressive results found in Table 1.

South Carolina

The state is divided into 16 community college service areas, most of which are multicounty, with an FTE credit enrollment in our 2012–2013 target year of 61,798. This makes South Carolina only slightly smaller than Iowa in terms of credit enrollments (61,798 vs. 64,472), with roughly the same urban–rural divide. But what is true for credit enrollments is not true for noncredit contact hours, which register as 2.3 million in South Carolina versus 7.3 million in Iowa in our target year.

Noncredit contact hours for each college were provided by the South Carolina Technical College System for the years 2001 to 2017. Although we had data for all 16 colleges in the system, one of the smaller colleges was eliminated from our analysis because of incomplete and/or conflicting data.

Table 1 shows that the adjustment for this state is less than half of that for Iowa. This is because the noncredit contact hours are far fewer. Still, its noncredit to credit ratio of 9.5% is the second largest among the new states added to this study. The range on this metric was even greater than that found in Iowa, going from 1.5% at the smallest college in the state with only 396 credit FTEs to 22.6% at another small college with only 1,788 credit FTEs in our target year.

Looking at the variation of noncredit contact hours and FTEs over the 2001–2018 period, we see a

great deal of volatility around a secular decline in all measures of enrollment, with FTEs falling from 9,242 in 2001 to 5,030 in 2017. This volatility is greater than that found in the other states in this study and might have been due in part to the persistent challenges in noncredit data reporting, as discussed by D’Amico et al. (2017). However, for our target year of 2012–2013, noncredit FTEs were reported to be 2.5 million, which is near the median of 2.6 million from the 2009–2010 to the 2017–2018 period. Again, this gave us some confidence that our target year could be classified as a more typical year for purposes of analysis.

While the state of South Carolina does not provide specific funding for noncredit education, the state’s system includes noncredit contact hours along with credit enrollments in its funding formula when allocating state funds to individual colleges. A notable exception would be training funds that are supported through economic development incentives or other special workforce development arrangements, but these sort of training funds are also found in most other states.

Tennessee

Tennessee has 13 community colleges and enrolled 58,786 credit FTEs in our target year of 2012–2013. This makes Tennessee only slightly smaller than two other community college systems added to our study (vs. Iowa with 64,472 and South Carolina with 61,794). Data on noncredit contact hours were provided by the Tennessee Board of Regents for the years 2008–2009 to 2019–2020. The colleges on the state list were identical to those we found on the CCRC/IPEDS list, so none had to be eliminated due to missing data. Unlike other state lists in this study, the courses for Tennessee include only activities

approved as workforce training. Recreational and personal interest courses are not included. However, it was revealed during our interviews that student record data would indicate that the courses not measured would not make up more than an additional 10% of the total. (Table 1 provides an estimate.)

It is important to note that the 27 Tennessee Colleges of Applied Technology (TCAT), which are part of the public system of postsecondary education, were not included in this study and might account for lower noncredit enrollment numbers across Tennessee's community colleges. As we learned from information provided by the state system, TCAT delivered more than 12 times the noncredit contact hours as the community colleges in recent years. The example of the TCAT colleges serves as a reminder that the current study does not provide a complete inventory of the workforce effort in these states, and instead focuses on only the measurement problem when using IPEDS data.

As Table 1 shows, Tennessee has the lowest noncredit to credit ratio of all eight states in our study, which is partially a reflection of the TCAT issue discussed above. Even when we add an estimate of the non-workforce activity, the percentage is only 3.3%. In fact, 7 out of 13 colleges have a noncredit to credit ratios of 1% or less, with the most active college at 9%. As in other states, the colleges in Tennessee exhibit a wide variation, even with these decidedly lower numbers. Moreover, the variation in noncredit enrollments does not mirror those on the credit side of the house, with eight up years and four down years since 2007–2008.

Although we have not tested this in any way, the presence of performance funding in the state could have also reduced the number of students

in noncredit courses at the community college. Workforce training contact hours are given some weight in the state point system, but degrees and certificates are favored. This has caused some bundling of noncredit courses into award programs that are then reported to IPEDS and for which students are eligible for more financial aid.

Virginia

The Virginia Community College System (VCCS) consists of 23 comprehensive colleges. The largest, Northern Virginia Community College, at 30,172 FTEs in our target year, draws on the suburbs of Washington, DC, and enrolls a disproportionate share of university transfer students. The smallest three comprehensive community colleges, registering from 539 to 800 credit FTEs, serve a decidedly different rural population.

The VCCS data, sent to us by the system office, include noncredit enrollments and contact hours for 22 colleges. One college, Reynolds Community College, was not included because its enrollment data and expenses for noncredit programs were shared with John Tyler Community College. To avoid double counting, both were eliminated from the study since it was impossible to isolate the enrollments and the general revenues and expenditures for them attributable to each college. We were left with 21 out of 23 colleges representing 2,571,523 of the VCCS total of 2,788,650 student contact hours for 2012–2013.

Virginia has the largest community college system, measured by credit enrollments of 96,862 FTEs, of any of the four new states in the current study. The largest community college, Northern Virginia Community College with a credit FTE count in our

target year of 30,172, also has the largest number of contact hours in noncredit courses (841,537). When adjusted for size, however, it shows a noncredit to credit ratio of 6.2%, just below the state average of 6.7%. The smallest community college in the system, Eastern Shore Community College, with 539 FTEs and 29,780 contact hours, has a ratio of 12.3%. Overall, the range on this measure is from 3.9% to 18.2%.

Data show that the number of contact hours and FTEs in noncredit courses increased from 6,197 FTE in 2013 to 6,795 FTE in 2018. Over that same period, the system saw two years with decreased noncredit FTEs and three years with increased noncredit FTEs. Declines of 42% at the largest college, from 2013 to 2018, were offset by impressive gains at 16 of the other colleges. It is notable that this cyclical pattern does not follow the FTE enrollments in credit programs. In fact, looking only at descriptive data, no pattern can be found in the noncredit numbers of the four states in this study, with rising numbers in Tennessee and Virginia and much larger falling numbers in Iowa and South Carolina. Local conditions are most surely the controlling factor in both credit and noncredit programs, but the swings are greater in the noncredit programs.

Although Virginia invested \$4.8 million in the VCCS noncredit programs in 2013, it has not generally provided much targeted public subsidy for the programs. Workforce development contact hours are not included in the state performance funding system as they are in Tennessee.

Comparisons: Community Colleges vs. 4-year Institutions

This study has shown that the real expenditure per FTE figure for community colleges is lower than the official IPEDS numbers used by researchers and the media. In comparing community college spending with that of other public colleges in the nation, for instance, the IPEDS figures in our target year of 2012–2013 were \$39,793 for public research universities, \$19,310 for public master's colleges, and \$14,090 for community colleges. Our work has shown that, once noncredit enrollments are included, the expenditure per FTE figure falls, making the per student spending gap between the community colleges and other public institutions even wider. But is the gap wider?

To get a more accurate picture of the gap in spending (and funding) among public colleges we would need to adjust the 4-year college expenditures per FTE for noncredit courses in the same way that we have for the community colleges. We do not have enough data to measure the magnitude of noncredit offerings at all of the public 4-year colleges in our sample. The figures we do have raise some interesting questions, however, and are intriguing enough to be presented in Table 2.

The sample shown in Table 2 is limited in many ways when compared with the community college data we have. It is only for two states and three systems—certainly important information on these states but hardly enough from which to draw generalizations for a national perspective. Interestingly, in our sample the noncredit FTEs and/or enrollment generated by the research universities in two of the systems, Iowa and New York (SUNY), is much larger than that of the community colleges. Though

Table 2. Noncredit Comparisons: -Public 4-Year and 2-Year Colleges, Selected Data and Years

State (System)	Public Research	Public Master's	Community Colleges
Panel A*: Average FTE Per College			
New York (SUNY)	3,346	57	473
New York (CUNY)	0	773	3,319
Panel B**: Enrollments (Number of Colleges)			
Iowa	646,582 (2)	8,738 (1)	214,563 (15)

Note: *2012-13, **2018-2019.

there are limitations, these figures do not provide a legitimate comparison, given our definition of noncredit.

In Iowa, 498,555 of the state's total noncredit contact hours for 4-year colleges of 655,310 (76%) are generated by Iowa State University, the state land grant institution. Of that, 99% are from cooperative extension activities (i.e., agriculture and 4-H youth programs). Land grant institutions generate a lot of activity.

Within the SUNY system, Cornell University (or at least a portion of it) is the land grant university. Its cooperative extension activities make up 50% of the noncredit contact hours and FTEs of the five public research universities in the SUNY system. Moreover, the state instructs colleges to include in their reporting all noncredit activity for grants, conferences, and faculty consulting in the community (Romano et al., 2016). Interestingly, the other public college system in the state, CUNY, asks colleges not to report any of these activities, giving the research universities zero activity in their reports to the state. Clearly the definition of noncredit is important and is not applied consistently.

In the state reports with which we have been working, the land grant institutions have been asked to claim cooperative extension activities. However, the revenue and expenses from these activities do not appear to be in university budgets. As such, they would not meet the definition of noncredit activity that impacts our study. The following is a statement received from a vice president at one of the large land grant institutions in our study: "I have connected with our Cooperative Extension administration and they have explained that the revenues and expenses associated with these non-credit contact hours are recorded in the financial systems of each local Cooperative Extension association. These revenues and expenses are not in the university's general ledger or financial statements and therefore would not be in the IPEDS numbers." This statement was circulated to two other land grant institutions, which signaled agreement with it. Land grant cooperative extension courses are not in university budgets but receive separate state appropriations for their operations. With the land grant numbers out of the picture, we can safely say that the community colleges in our sample of states generate more FTEs and offer more noncredit courses to the community than public

research universities in their states. This is even truer of public master's level colleges, against which community colleges are more likely to be compared.

The public master's colleges in our sample of states have lower noncredit hours than any of the public colleges included in our study, including public bachelor's colleges, which we did not show. One caveat here is that, in geographic areas not serviced by a community college, the noncredit offerings of nearby public 4-year colleges may be higher than in our sample. This possibility is suggested in a recent study by McClure et al. (2021) of 118 rural 4-year colleges in 39 states.

Looking beyond the figures shown in Table 2, we have found that, even more than the community colleges, the 4-year colleges and universities in our small sample offer noncredit courses that closely conform to their credit offerings and the specialties of their faculty. This is especially true for those institutions with professional schools, such as schools of medicine, law, business, agriculture, and/or pharmacy.

In the final analysis, even considering the adjustments necessary to account for the noncredit courses offered by public 4-year colleges, the gap in the expenditure per FTE figures between the community college and 4-year sectors will grow beyond those shown in official IPEDS figures

DISCUSSION AND FURTHER RESEARCH

Issues involving the nature of college costs are of great interest to students and/or parents, policymakers, taxpayers, and the media. The key metric in measuring college costs is what colleges spend to educate students, in particular their expenditures per student FTE. This article is concerned with the proper measurement of this metric and has shown that the official figures that measure it are inflated for all colleges that offer noncredit education, but in particular those that are inflated for community colleges.

When considering the issue from either an expenditure or a revenue perspective, community colleges are at an even greater financial disadvantage than IPEDS figures indicate, due to the exclusion of noncredit enrollments. Our study reinforces the previous work done on this issue and shows that figures within the current IPEDS universe that depend on a per student FTE figure will be inaccurate. Additionally, not accounting for noncredit enrollments results in an undervaluing of the comprehensive mission of community colleges, particularly the mission of the noncredit workforce development function.

Using our sample, the measurement error created by the exclusion of noncredit enrollments can be as much as 25% (North Carolina) or as little as 2.9% (Tennessee). Researchers and the media often like to use figures drawn from the nation instead of from the states, but it is not possible for us to give anything but an educated guess on what that figure might be. We do have some large states in our sample, and national data often track that in California because that state enrolls about 20% of

the national total of credit students. Weighting our sample of states by their enrollments, we would estimate that the community college expenditure figures per FTE, as calculated from official IPEDS data, could be reduced by 8%–10% to take into account the exclusion of noncredit enrollments.

We are also not able to discern definite national trends in noncredit enrollments from our sample of states since our target year of 2012–2013. However, they appear to be downward, which means that the measurement error is decreasing. The impact of the pandemic will throw all of our trend numbers into disarray, but surely future research will be engaged in examining the impact of this event on enrollments and outcomes, further reinforcing the need for noncredit data collection at the national level.

Future research will also be shaped, in part, by what the NCES does about including noncredit enrollments in the IPEDS database. The new numbers will generate new lines of research. At present, research will continue to grapple with what we have found. This includes questions about the role that noncredit courses play in workforce education, precollege remediation, and other community needs. In addition, the central collection of data could lead to more-robust studies of noncredit funding, since we know from previous research (D'Amico et al., 2017) that not all states fund noncredit activities.

Both this and the previous study (Romano et al., 2019) have a number of limitations. First, the results shown in Table 1 are based on a single point in time. We are reasonably confident that our target year of 2012–2013 is not an outlier; given the volatility in noncredit enrollments, however, a longer time

frame would be desirable. Second, even though our sample of states accounts for 42% of the credit enrollments in the nation, some large states are not included, Florida and Texas in particular. Clearly, the inclusion of more states could change our estimate of a national average.

Another shortcoming of our studies is that our conclusions are based on estimates. There is no uniform national framework for collecting data on noncredit enrollments or other noncredit activity. We choose to be hopeful that TRP #62 (RTI International, 2021) marks additional interest and momentum toward national data collection that would include noncredit enrollments. Though it would be an additional burden on states to collect and report these data, using a standardized noncredit typology (e.g., D'Amico et al., 2014) and reporting contact hours that could be converted into FTEs would allow states, researchers, policymakers, and others to accurately report per FTE calculations and better capture the full mission of community colleges, in particular. States could consider beginning to prepare for such data collection in advance of reporting mandates. It is our hope that, by illustrating some of the issues with per FTE calculations and shortcomings with data collection, this study will provide additional context for both state and national discussions on noncredit data gathering.

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