The AIR Professional File

Fall 2021 Volume

Supporting quality data and
decisions for higher education.

air | ASSOCIATION FOR INSTITUTIONAL RESEARCH

FALL 2021 VOLUME OVERVIEW

Completing a degree that leads to gainful employment at a reasonable cost is a key desired outcome of higher education. Many stakeholders want reliable job placement and return-on-investment information to understand how well institutions achieve this outcome. Prospective students want help making decisions about whether to attend college, where to attend, and what major to select. College graduates are interested in earnings data for their degrees so that they are better prepared for salary negotiations. State policymakers are concerned with student loan default rates and the shares of graduates choosing to leave the state. Job placement and college costs are the topics covered in the current issue of *The AIR Professional File*.

In the article *Using State Workforce Data to Report Graduate Outcomes*, Matt Bryant shares the process and methodology used to measure employment outcomes of graduates of a public university and compares survey data with state wage records. This article is an excellent source of information for institutions seeking innovative methods for studying graduates' earnings and job placements.

In their article *How Noncredit Enrollments Distort Community College IPEDS Data: An Eight-State Study*, Richard M. Romano and Mark M. D'Amico discuss implications of excluding noncredit enrollments when calculating IPEDS expenditures per student full-time equivalent (FTE). As IR professionals, we are frequently asked to benchmark our institutions against peers, and a commonly used IPEDS metric for benchmarking college costs is expenditures per student FTE. The results of this study help us better understand the limitations of this measure and how excluding noncredit enrollments from expenditures per FTE calculations has differential effects across institution types.

Editorial Transition Announcement

In October 2021, Sharron Ronco retired from her role as editor of *The AIR Professional File*, the association's scholarly journal. We thank Sharron for her years of leadership and service! We are pleased to announce that Iryna Johnson and Inger Bergom now serve as editor and assistant editor, respectively.

Iryna Johnson, Editor

Iryna Johnson currently serves as Assistant Vice Chancellor for System Analytics and Business Intelligence at the University of Alabama System (UAS). She has over 17 years of experience in institutional research and has been a member of AIR since 2004. Iryna's publications and presentations emphasize appropriate statistical methods for institutional research data. She received the AIR Charles F. Elton Best Paper Award on three different occasions. Iryna holds equivalents of Ph.D. and Master's degrees in Sociology from Taras Shevchenko National University of Kyiv, Ukraine.

Inger Bergom, Assistant Editor

Inger Bergom is an institutional researcher in the Boston area and has worked in higher education since 2007. Inger earned a Ph.D. and M.A. from the Center for the Study of Higher and Postsecondary Education at the University of Michigan, specializing in evaluation and assessment, learning and teaching, and faculty work. Her work has been published in peer-reviewed journals including Journal of Higher Education, Review of Higher Education, and Journal of Engineering Education.

ISSN 2155-7535

Table of Contents

Using State Workforce Data to Report Graduate Outcomes

Matt Bryant

About the Author

Matt Bryant, MEd, is a higher education consultant who specializes in strategic planning, program assessment, and performance reporting. He lives in Bellingham, Washington, where he currently works in the Enrollment and Student Services division at Western Washington University.

Acknowledgments

This case study describes a process for refining and applying methodology outlined by David Troutman and Jessica Shedd in their 2016 article, "Using State Workforce Data to Examine Postgraduation Outcomes," published in issue 169 of *New Directions for Institutional Research.* Many thanks to the authors for their informative scholarship, to my supervisors at Western Washington University for supporting this work, and to John Krieg, PhD, for his insight and mentoring.

Abstract

Survey methodology is the dominant approach among universities in the United States for reporting employment outcomes for recent graduates. However, past studies have shown that survey methodology may yield upwardly biased results, which can result in overreporting of employment rates and salary outcomes. This case study describes the development and application of an alternative reporting methodology, by which state wage records are analyzed to determine employment and salary outcomes for recent graduates. Findings at Western Washington University suggest the significant sample sizes that can be achieved using wage record methodology may provide a more reliable option than survey methodology for accurately reporting graduate outcomes.

Keywords: graduate outcomes, graduate employment, earnings reporting, wage records data

The AIR Professional File, Fall 2021

Article 154

https://doi.org/10.34315/apf1542021

Introduction: Why Not Survey?

For decades, universities in the United States have relied on survey methodology to report employment outcomes for recent graduates. Survey methodology has been recognized as a best practice for reporting graduate outcomes since the late 1970s (Pace, 1979). More than 360 universities use survey methodology every year to report graduate outcomes to the National Association of Colleges and Employers (NACE), an organization considered to be the national authority on graduate outcomes reporting (NACE, 2019a). Western Washington University (WWU), the sample institution for this case study, has used survey methodology to report graduate outcomes through its annual *Employment Status Report* since 1990.

Despite the history and prevalence of survey methodology, survey results might not accurately reflect graduate outcomes due to nonresponse biases. Meta-analysis of survey research shows that "large nonresponse biases can happen in surveys," and indeed such biases are often present (Groves & Peytcheva, 2008, p. 183). In particular, analysis of graduate follow-up surveys find that successful graduates are more likely to respond, yielding upwardly biased results and thus negatively impacting external validity (Dey, 1997; Grosset, 1994). This sort of bias has been observed across survey elicitation methods; while it can sometimes be corrected through postsurvey weighting techniques, such adjustments require auxiliary variables that are typically beyond the scope of such instruments (Dey, 1997; Groves, 2006; Hudson et al., 2006).

Bafflingly, NACE addresses neither nonresponse biases nor data validity in its standards and protocols for graduate outcomes surveying. NACE does recommend a minimum response rate (using the term "knowledge rate") of 65% (NACE, 2019b). However, while "good survey practices dictate striving for a high response rate as an indicator of the quality of all survey estimates" (Groves, 2006, p. 670), it is also the case that "higher response rates do not necessarily reduce nonresponse bias" (Groves, 2006, p. 663). Nevertheless, "overall response rate is one guide to the representativeness of the sample respondents" and a minimum survey response rate of 50% is considered "adequate for analysis and reporting" (Babbie, 2001, p. 256).

Unfortunately, WWU saw the knowledge rate for its employment status reports gradually decline from more than 60% in the 1990s to around 40% in the 2010s, which is consistent with national trends in survey research (Groves, 2006; WWU 1990, 2016a). Furthermore, the knowledge rate reported throughout the 2010s was not the actual survey response rate, but rather the percent of graduates for whom any data were collected, either by survey *or* by a supplementary process. This supplementary process (which by 2014 was included as a suggestion in the NACE protocols) was to search the LinkedIn website for employment records for graduates, and to include those with employment records on the website in the report sample (NACE, 2019b).

Regrettably, this *modified survey methodology* resulted in a significant percentage of the sample being selected based on the primary outcome variable of the study. Since LinkedIn data can be sampled only for those with recent employment records, those data can capture only positive employment outcomes. This sampling methodology represents a systematic form of selection bias that positively skews results and negatively impacts internal validity (Mare & Winship, 1992). Additionally,

this process provided little information beyond when and where an individual was employed; consequently, other measures in the employment status reports were presented as representative of the population, despite being based on only a very small number of survey responses. For example, the average salary reported for 2015–2016 bachelor's degree graduates (a population of 3,280 individuals with a reported sample of 45%) was based on only 100 survey responses (since salary data are not available on LinkedIn, and the salary item was optional on the survey instrument), and therefore represented only 3% of the overall population (WWU, 2017).

Finally, by 2016 it had become apparent that the employment status reports for WWU were in conflict with data from other sources. Since 2012 the university alumni survey (administered 1 to 2 years after graduation) had yielded employment rates 5%–9% lower than those presented in the employment status reports (administered 9 to 12 months after graduation), and did so with more-robust methodology and higher (actual) response rates (WWU, 2016b). Clearly, WWU needed better methodology in order to report outcomes more accurately[1] for recent graduates. This case study describes the process of identifying, developing, and implementing a new methodology for reporting employment outcomes based on state wage records, and presents initial findings and considerations for further research.

ALTERNATIVES: AVAILABLE DATA SOURCES

When initial efforts began in 2017 to implement new methodology for reporting graduate outcomes at WWU, the author was unable to identify a single public university in the United States that was reporting employment rates using any form of alternative methodology.[2] Without exception, every university in the Pacific Northwest region and every peer institution in the country was reporting graduate outcomes using survey methodology (of various levels of modification) according to the NACE protocols.

Graduate outcomes consist of two primary measures: percentage of graduates employed, and percentage of graduates seeking further education (within 6 months of graduation, according to NACE). For the latter measure, subsequent enrollment records for graduates were already available to WWU through the National Student Clearinghouse; this rate could be calculated with a high degree of accuracy. However, there was no comparable national source for employment records available in 2017, and there is still no such resource available in 2021.

Publicly available employment data exist in three primary forms: as national census data (based on survey responses), as national social security data (based on tax records), and as state wage record data (collected directly from employers). However, the Higher Education Opportunity Act of 2008

1. To be clear, I describe here the former practices at WWU not to call into question the work of the fine professionals who preceded me, but because those professionals were simply observing best practices advocated by a leading national organization, and because similar practices are still in use presently at many other institutions.

2. The University of Texas began providing graduate earnings data based on wage records in 2014; however, these data were not used to determine employment rates and reflected earnings starting only 1 year after graduation, and not during the critical 6-month postgraduation time period typically emphasized in graduate outcomes reporting.

banned the linking of national data to student-level record information, making it impossible to use federal data sources at the institutional level for outcomes reporting. This left wage record data, which were already being used in Washington State to report average earnings for graduates 1 or more years after graduation (Education and Research Data Center [ERDC], 2017).

However, although wage records "account for the vast majority of workers in a state" and are "considered to be one of the most accurate data sources," these records were presumed to provide insufficient data for calculating employment rates (Troutman and Shedd, 2016, p. 89). In fact, in the article that inspired this case study, this argument was presented on the basis that wage data are limited to workers employed in a given state, and therefore "without data on employment out-of-state, institutions would be underestimating, to varying levels of degree, the true employment rate of graduates" (Troutman and Shedd, 2016, p. 89). There was also the limitation that wage data cannot account for all types of employment, because the records exclude federal and self-employed workers, and therefore cannot provide outcomes even for all graduates employed in-state. Nonetheless, while the apparent shortcomings of using wage records to report graduate outcomes proved to be challenges, it was determined these limitations could be accounted for with appropriate methodology (see Methods section, this article).

PROCESS: ACCESSING DATA

In many states, individual-level wage records are available to public institutions for evaluative purposes through state agencies, but these institutions can access the records only once an appropriate data-sharing agreement has been established. The specific agency and process for establishing such an agreement will vary by state, and those interested in obtaining wage records should begin the process by contacting their state labor office.[3] For this case study, a data-sharing agreement was established with the Employment Security Department (ESD) of Washington State, thus providing access to wage records (including wages earned, hours worked, and employer details) for WWU graduates.

Worth noting here is the timeline of this process. Because graduate employment outcomes are measured 6 months after graduation,[4] it is necessary to wait two fiscal quarters after the last members of the cohort have graduated in order to capture outcomes for those graduates who gained employment during the second quarter. Furthermore, it is necessary to wait an additional fiscal quarter to capture a full quarter of earnings for those graduates who gained employment during the second quarter, since records of employment gained during the second quarter will not include a full quarter of wages for estimating annual earnings.

3. The data-sharing agreement for this case study required nearly 6 months to be finalized; those interested in establishing such an agreement may wish to initiate this process as soon as possible to ensure timely access to data.

4. It is also worth noting that wage record methodology provides an advantage over survey methodology in observing this reporting timeline. NACE recommends surveying each graduating class the following December, which results in capturing outcomes 15 months after graduation for those cohort members who graduated in the summer quarter, and outcomes 6 months after graduation for those cohort members who graduated in the spring quarter (for institutions using quarterly scheduling). Wage record methodology allows for effectively analyzing results for an entire cohort exactly 6 months after graduation, regardless of the term of completion for each individual.

In the state of Washington wage records become available approximately 8 weeks after the end of the fiscal quarter. Therefore, for a full analysis of outcomes for an annual class of graduates (by the methodology described in the Methods section), it is necessary to wait three fiscal quarters plus an additional 8 weeks, or approximately 11 months, for data to become available. Likewise, to capture educational outcomes for individuals 6 months after graduation, it is necessary to wait for enrollment records to become available for the third quarter after graduation to capture outcomes for those graduates enrolled in programs that commenced at the end of the 6-month time period. (The preceding is based on the assumption that intent to enroll was established during that time period, and to account for the varying academic calendars and program start dates across the myriad higher education institutions in the United States.)[5] It is worth noting that this timeline does not yield outcomes data by the deadlines set by NACE to be included in its annual First-Destination Survey. This timeline can be considered a limitation of the methodology applied for this case study, or a weakness of the current methodology used by NACE for reporting graduate outcomes, the timeline of which is simply not long enough to allow for using actual employment and enrollment records to verify or report outcomes.

To request wage records, it is necessary to provide identifying data for individuals. To analyze annual graduate employment outcomes, it is necessary to provide identifying data for all individuals in the defined graduating class. For the methodology described in the Methods section, the group of all graduates in a given class represents the study population.

State agencies responsible for processing wage record requests will likely require social security numbers to identify individuals. For the purpose of this case study, student university identification numbers were also provided, allowing for social security numbers to be removed from the returned records, while maintaining the ability to identify individuals. Those university identification numbers were then matched to institutional records for each individual, including degree program, demographic data, and permanent address. Finally, these data were matched with enrollment records for those individuals, requested through the National Student Clearinghouse, to allow for comprehensive analysis of outcomes for the study population.

METHODS: CALCULATING OUTCOMES

Once enrollment and wage records have been obtained for a graduating class, data should be cleaned, matched, and sorted for analysis. Troutman and Shedd provide excellent guidance on data cleaning and preparation for analysis, including a decision tree for processing inconsistencies in wage records, which is a tedious but necessary task "to ensure data are accurate and reliable" (Troutman and Shedd, 2016, p. 23). At a minimum, this process requires removing unidentified and duplicate records, appropriately sorting instances of multiple records (for graduates with multiple employers), and identifying any outlier records to be excluded from the sample dataset.[6] A variety of software programs of varying degrees of sophistication can simplify this process; for the purposes of this case study, the use of Microsoft Access with simple queries to join,

5. At WWU the academic year ends in June. As a result, enrollment records for each annual cohort are requested from the National Student Clearinghouse the following March, and wage records from the ESD the following May. These records are used to calculate outcomes for an annual report of graduates from the previous academic year; the report is published each June.

6. The ERDC of Washington State also provides useful guidance for linking and cleaning data in its *Employment Data Handbook* (ERDC, 2012). Note that part of the data-cleaning process at WWU has included removing from the sample any individual records reflecting less than 1 hour of work at minimum wage in order to avoid skewing aggregate outcomes with isolated earnings unrepresentative of continuing employment.

compare, and filter records proved to be sufficient for data preparation.

Once data have been properly prepared, calculations for graduate employment outcomes are not particularly sophisticated, and primarily depend on accurately defining the measures to be analyzed. As mentioned above, the population for each report consists of all individuals in the graduating class, and definitions are provided in Table 1 for each measure of that population.

Table 1. Measure Definitions

Measures	Definitions
Sample	Population individuals with permanent addresses in the state
Seeking Further Education	Sample individuals with enrollment records within three quarters of graduation
Employed	Sample individuals not enrolled in further education with positive wage records in the second quarter after graduation
Earnings	Annualized earnings based on third quarter wage records for individuals considered "Employed"
Other	Sample individuals who do not meet criteria above for "Seeking Further Education" or "Employed"

Calculating these measures is a fairly straightforward process:

1| The sample is selected based on permanent address. If, at the time of analysis, an individual has an in-state permanent address in the student information system, that individual is included in the sample.[7]

2| National Student Clearinghouse enrollment records are then analyzed for the second and third quarters after graduation for each individual in the sample. Those with enrollment records in the second or third quarter are considered to be "Seeking Further Education," and wage records are not analyzed for those individuals.

3| Wage records are then analyzed for the second quarter after graduation for the remaining individuals in the sample (those not "Seeking Further Education"). Those with positive wage records in the second quarter are considered to be "Employed."

4| Wage records are then analyzed for the third quarter after graduation for each individual considered to be "Employed," with third quarter wages for each individual quadrupled to estimate annual earnings.

7. This is a critical component of the methodology for this study. The permanent address field in the student information system at WWU is updated quarterly based on United States Postal Service records and alumni outreach efforts and is considered to be a reliable indicator of a graduate's current residence. If a high percentage of graduates reside in-state, then limiting the sample to those individuals represents a workaround to the issue of not capturing out-of-state employment. With approximately 90% of WWU graduates residing in-state, sample sizes have provided confidence in assuming outcomes for in-state graduates are also generally representative of graduates who reside out-of-state. This suggestion is supported by the fact that Washington has the second-highest median wage of any state and also has a statistically average employment rate. Even if all graduates who left Washington ended up moving to Massachusetts, which is the state with the highest median wage and among the highest employment rates, employment and average earnings for the population would increase by less than 0.5% overall (StatsAmerica, 2020). However, this methodology may not be effective for institutions with graduates who are more geographically dispersed, although it could be possible to obtain wage records from neighboring states to account for broader geographical dispersion (Troutman and Shedd, 2016).

5| The remaining individuals in the sample (those not "Seeking Further Education" or not "Employed") are considered to be "Other," a category that accounts for graduates who are still seeking employment or who are engaged in other activities (nontraditional employment, parenting, traveling, volunteering, etc.).

Once these calculations have been made, some adjustments are necessary to determine accurate outcomes rates. The issue of wage records capturing only in-state employment is addressed by limiting the sample to graduates living in-state (see footnote 7). In order to address the issue of wage records capturing only certain types of employment, however, it is necessary to adjust the employment rate to reflect unrepresented types.

Wage data "cover approximately 90 percent of the workforce, including private businesses, state and local governments, some nonprofit organizations, and Indian Tribes" (Mullin, 2012, p. 76). This results in two primary unrepresented types of employment: federal employment and self-employment.[8] In order to account for these types of employment, the sample employment rates for this case study have been adjusted based on the federal employment (2.2% [Office of Personnel Management (OPM), 2017]) and self-employment rates (10.5% [Hipple & Hammond, 2016]) for Washington State. Applying these rates as ratios, a total proportional increase of 14.5% was made to the sample employment rate,[9] with corresponding decreases to the rates of students categorized as "Other," to determine the overall employment rate for each cohort.

8. The ESD of Washington State publishes a useful guide on types of nonfederal occupations that are not represented in unemployment insurance wage data. A thorough review reveals a variety of occupations that can be categorized as either nontraditional work (elected, religious, small-scale [less than $1,000/quarter], inmate/patient/student, unpaid) or self-employment work (ESD n.d.). For the purposes of this study, nontraditional employment is assumed to be minimal and to be reflected in the "Other" category; federal and self-employment are accounted for by the adjustment described in footnote 9.

9. For this adjustment, the federal and self-employment rates noted above are used to determine a ratio for federal/self-employed workers to other worker types in the state, a value of .145. That value is then applied to the rate of other worker types observed in the sample, to account for unrepresented types of workers in calculating the overall employment rate.

FINDINGS: ANALYZING OUTCOMES

In 2018 WWU began using the wage records methodology described above to report outcomes for the 2016–2017 graduating cohort. However, WWU also requested records for the 2014–2015 and 2015–2016 graduating cohorts, for whom outcomes were previously reported using modified survey methodology, in order to compare outcomes by methodology for the same cohorts. Cumulative outcomes by methodology type for each of those cohorts are presented in Table 2.

Table 2. Outcome Comparisons

Measures	14–15 Survey	14–15 Records	15–16 Survey	15–16 Records
Population	3,174	3,174	3,308	3,308
Sample	42.7%	93.4%	45.2%	92.3%
Employed	82.7%	75.2%	83.1%	75.6%
Further Education	11.9%	12.0%	13.2%	12.9%
Other	5.4%	12.8%	3.7%	11.5%
Salaries Reported	296	1,945	100	2,011
Average Salary	$38,732	$29,782	$43,570	$30,083

Source: WWU, 2016a, 2017.

Basic analysis comparing the different outcomes sets in Table 2 indicates that, for each cohort, modified survey methodology produced an approximately 10% higher employment rate (for an overall rate increase of 7.5 percentage points) and a 30%–45% higher average salary measure, based on a 50% smaller sample than wage record methodology. These comparisons provide some indication of the extent to which the modified survey methodology used previously may have resulted in overreporting of graduate outcomes. Furthermore, the significant sample sizes that can be achieved using wage record methodology suggest it may be the most reliable option for accurately reporting graduate outcomes. For this case study, differences in sample sizes between modified survey and wage record methodology are especially apparent with regard to the average salary measure. Wage records provided salary data for more than 60% of the population, whereas survey responses previously provided salary data for less than 10% of the population. At WWU, where regional and demographic factors allow for sampling sizes exceeding 90% of the population, wage record methodology has proven to provide more-consistent and more-reliable data for a far greater number of graduates and has consequently become the primary approach used at the university for reporting graduate outcomes.[10]

10. WWU has since implemented a graduate outcomes report dashboard summarizing wage record data for cohorts dating back to 2006–2007 (using a slightly modified version of the methodology described in this article), and no longer publishes past employment status reports. The graduate outcomes report dashboard can be viewed at WWU (2021).

DISCUSSION: CONSIDERING IMPLICATIONS

While the wage record methodology described in this article was designed to minimize confounding factors, it does rely on some imperfect assumptions: that most graduates are working in the state in which they reside, that outcomes for in-state graduates are generalizable to out-of-state graduates, and that graduates acquire federal employment and self-employment at the same rates as the state workforce. There are also some additional limitations to using wage record methodology to report graduate outcomes. As previously mentioned, the timeline for requesting wage records does not allow for the resulting outcomes to be submitted for inclusion in NACE's First-Destination Survey, an annual national publication. More significantly, wage records do not include job titles, a key piece of outcomes information often requested by prospective students, which is critical for determining a rate for field-related employment. While it is not possible to determine whether employment reflected in wage records is field-related, job titles for individual graduates can be reported more reliably using survey methodology. At WWU, sample job titles for recent graduates are reported separately based on responses collected for the university alumni survey. Finally, wage records might not allow for reporting outcomes for very small programs or majors without the risk of aggregate data becoming individually identifiable. At WWU, employment outcomes are suppressed for programs or majors with four or fewer members in the sample for this reason.

This case study presents one possible methodology for using wage records to report graduate outcomes. Depending on the institution, other methodologies for using wage records could be more appropriate. In particular, institutions with graduates who are more geographically dispersed might need to obtain data from neighboring states to accurately report employment outcomes. In 2018 a partnership was announced between the University of Texas System and the United States Census Bureau's Longitudinal Employer-Household Dynamics (LEHD) program to report national aggregated data of graduate earnings by institution and major. This reporting was accomplished through a "powerful but 'imperfect' workaround to the current ban on a federal database that would link student-level educational data to national employment data, which was forbidden by the 2008 Higher Education Act" (Bauer-Wolf, 2018, para. 2). Partnering with the LEHD program might provide public institutions with access to national wage record data, but partnerships must be established at the state level, and only nine states currently provide data for a majority of graduates (United States Census Bureau, 2021).

Additionally, for those institutions without access to wage records data, this case study may provide some best practices in improving survey methodology to report graduate outcomes more accurately. One of these best practices may be to avoid the modified process for data collection advocated by NACE (using LinkedIn profiles), which results in selection bias, positively skews results, and negatively impacts internal validity. Another best practice may be to collect identifying information and auxiliary variables for survey respondents, in order to correct nonresponse bias through postsurvey weighting. It might also be useful to require critical items (e.g., salary) to maintain strength of sample size, as well as to include items beyond economic outcomes (e.g., satisfaction

questions) to encourage engagement from those with less-favorable outcomes.

Finally, it is worth mentioning that there are other potentially unexplored uses for wage records data that could prove meaningful to institutional research efforts. Wage records data, including hours worked, wages earned, and employer industry, can be used to analyze employment outcomes by demographics, to measure the impacts of specific employment support interventions, and even to analyze the impacts of employment for students who are currently enrolled. Ultimately, wage records represent a promising data source for use by higher education administrators to increase accountability and transparency, and to inform efforts to improve graduate outcomes.

REFERENCES

Babbie, E. (2001). *The practice of social research* (9th ed.). Wordsworth.

Bauer-Wolf, J. (2018). A "workaround" to U.S. ban on student-level data. *Inside Higher Education.* https://www.insidehighered.com/news/2018/03/27/university-texas-system-releases-new-student-outcome-database

Dey, E. (1997). Working with low survey response rates: The efficacy of weighting adjustments. *Research in Higher Education, 38*(2), 215–227.

Education and Research Data Center (ERDC). (2012). *Employment data handbook.* https://www.erdc.wa.gov/sites/default/files/publications/EmploymentDataHandbook_v1.pdf

Education and Research Data Center (ERDC). (2017). Earnings for graduates dashboard. https://erdc.wa.gov/data-dashboards/earnings-for-graduates

Employment Security Department (ESD). (n.d.). Occupations exempted from unemployment insurance coverage. https://media.esd.wa.gov/esdwa/Default/ESDWAGOV/employer-Taxes/ESD-exempt-professions-chart.pdf

Grosset, J. (1994). The biasing effects of nonresponses on information gathered by mail surveys. Office of Institutional Research, Community Colleges of Philadelphia.

Groves, R. M. (2006). Nonresponse rates and nonresponse bias in household surveys. *Public Opinion Quarterly, 70*(5), 647–675.

Groves, R. M., & Peytcheva, E. (2008). The impact of nonresponse rates on nonresponse bias: A meta-analysis. *Public Opinion Quarterly, 72*(2), 167–189.

Hipple, S. F., & Hammond, L. A. (2016). Self-employment in the United States. Spotlight on Statistics, Bureau of Labor Statistics.

Hudson, D., Seah, L-H, Hite, D., & Haab, T. (2006). Telephone presurveys, self-selection, and non-response bias to mail and internet surveys in economic research. *Applied Economics Letters, 11*(4), 237–240.

Mare, R., & Winship, C. (1992). Models for sample selection bias. *Annual Review of Sociology, 18,* 327–350.

Mullin, C. M. (2012). Understanding the workforce outcomes of education. *New Directions for Institutional Research, 153,* 75–88.

National Association of Colleges and Employers (NACE). (2019a). *First destinations for the college class of 2018.* https://www.naceweb.org/job-market/graduate-outcomes/first-destination/class-of-2018/

National Association of Colleges and Employers (NACE). (2019b). *Standards and protocols for the collection and dissemination of graduating students initial career outcomes information for undergraduates.* https://www.naceweb.org/uploadedfiles/files/2020/publication/first-destination/first-destination-survey-standards-and-protocols.pdf

Office of Personnel Management (OPM). (2017, September). Federal civilian employment: Policy, data, oversight; data, analysis & documentation. https://www.opm.gov/policy-data-oversight/data-analysis-documentation/federal-employment-reports/reports-publications/federal-civilian-employment/

Pace, C. R. (1979). *Measuring outcomes of college.* Jossey-Bass.

StatsAmerica. (2020). *Occupational median annual wage in 2020.* https://www.statsamerica.org/sip/rank_list.aspx?rank_label=ow_c&item_in=00-0000&ct=S09

Troutman, D. R., & Shedd, J. M. (2016). Using state workforce data to examine postgraduation outcomes. *New Directions for Institutional Research, 169,* 87–102.

United States Census Bureau. (2021). *Post-Secondary Employment Outcomes.* https://lehd.ces.census.gov/data/pseo_experimental.html

Western Washington University (WWU). (1990). *1989–1990 Graduate survey.* Out of print, copy available from author.

Western Washington University (WWU). (2016a). *2014–2015 Employment status report.* Out of print, copy available from author.

Western Washington University (WWU). (2016b). WELS [Western Educational Longitudinal Study] *Alumni Survey 2012–2016.* https://oie.wwu.edu/wels/alumni-survey/

Western Washington University (WWU). (2017). *2015–2016 Employment status report.* Out of print, copy available from author.

Western Washington University (WWU). (2021). Graduate outcomes report. Office of Institutional Effectiveness. https://oie.wwu.edu/employment-security-wage-data/

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

Richard M. Romano and
Mark M. D'Amico

About the Authors

Richard M. Romano is Professor Emeritus of economics at Broome Community College (State University of New York) and director of the Institute for Community College Research. He is also an affiliated faculty member at the Cornell Higher Education Research Institute at Cornell University. Mark M. D'Amico is professor of higher education at the University of North Carolina at Charlotte. Prior to his faculty role, he was an administrator in the South Carolina and North Carolina systems of higher education.

Acknowledgments

Although they bear no responsibility for the current study, this line of research would not have been possible without the coauthors who worked with us in the previous study (Romano et al., 2019): Rita Kirshstein (George Washington University), Michelle Van Noy (Rutgers University), and Willard Hom (California). For the current study, a number of state- and campus-level people helped us in the preparation of data and agreed to interviews. Some wished to remain anonymous. Others were Vladimir Bassis, Jason Pontius, and Brenda Ireland (Iowa); Tammy Lemon and Russ Deaton (Tennessee); Carrie Douglas and Catherine Finnegan (Virginia); and Rosline Sumpter and Brad Neese (South Carolina). We also benefited from the help of John Fink and Davis Jenkins (Columbia University), Anthony Carnevale (Georgetown University), Ron Ehrenberg (Cornell University), and Pamela Eddy (College of William & Mary). Asking states for data during the pandemic was risky business; despite reduced staffing and the demands of the state systems to generate information for budget decisions, however, state representatives were generous with their time and were always available for follow-up questions. We are very grateful for their effort.

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

The AIR Professional File, Fall 2021

Article 155

https://doi.org/10.34315/apf1552021

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 NCES 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 × 15 × 2 = 450 contact hours = 1 FTE. California uses a 17.5-week semester so for that state we calculate 15 × 17.5× 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.

REFERENCES

American Association of Community Colleges (AACC). (2021). *Fast facts 2021.* https://www.aacc.nche.edu/wp-content/uploads/2021/03/AACC_2021_FastFacts.pdf

Baum, S., & Kurose, C. (2013). Community colleges in context: Exploring financing of two-and four-year institutions. In *Bridging the higher education divide: Strengthening community colleges and restoring the American dream* (pp. 73–108). Century Foundation Press. https://production-tcf.imgix.net/assets/downloads/20130523-Bridging_the_Higher_Education_Divide-Baum_Kurose.pdf

D'Amico, M. M., Morgan, G. B., Katsinas, S. G., Adair, J. L., & Miller, M. T. (2017). A national analysis of noncredit community college education: Enrollment, funding, accountability, and contextual issues. *Community College Journal of Research and Practice, 41*(4–5), 288–302. https://doi.org/10.1080/10668926.2016.1251349

D'Amico, M. M., Morgan, G. B., Robertson, S., & Houchins, C. (2014). An exploration of noncredit community college enrollment. *Journal of Continuing Higher Education, 62*(3), 152–162. https://doi.org/10.1080/07377363.2014.953438

D'Amico, M. M., Morgan, G. B., Thornton, Z. M., & Bassis, V. (2020). Noncredit education enrollment and outcomes: Exploring the "black box" of noncredit community college education. *Career and Technical Education Research, 45*(2), 17–38. https://doi.org/10.5328/cter45.2.17

Desrochers, D. M., & Hurlburt, S. (2016). *Trends in college spending 2003–2013.* Delta Cost Project, American Institutes for Research. https://www.air.org/sites/default/files/2021-08/Delta-Cost-Trends-in-College-Spending-January-2016.pdf

Erwin, M. (2020). *Noncredit enrollment and related activities* (NPEC 2019). National Postsecondary Education Cooperative, with US Department of Education funding. https://nces.ed.gov/ipeds/pdf/NPEC/data/NPEC_Paper_Noncredit_Enrollment_and_Related_Activities.pdf

Feldman, D. H., & Romano, R. M. (2019). Drivers of community college costs and prices. *Change: The Magazine of Higher Learning, 51*(3), 21–27. https://doi:10.1080/00091383.2019.1606583

Fink, J., & Jenkins, D. (2020, April 30). Shifting sectors: How a commonly used federal datapoint undercounts over a million community college students. *The mixed methods blog.* Community College Research Center, Columbia University. https://ccrc.tc.columbia.edu/easyblog/shifting-sectors-community-colleges-undercounting.html

Grubb, N. W., Badway, N., & Bell, D. (2003). Community colleges and the equity agenda: the potential of non-credit education. Community College Research Center, Columbia University. https://ccrc.tc.columbia.edu/publications/potential-of-noncredit-education.html

Hillman, N. (2020, November 20). *Why rich colleges get richer & poor colleges get poorer: The case for equity-based funding in higher education.* Third Way. https://www.thirdway.org/report/why-rich-colleges-

get-richer-poor-colleges-get-poorer-the-case-for-equity-based-funding-in-higher-education

Kolbe, T., & Kelchen, R. (2017). *Identifying new metrics using IPEDS data* (NPEC 2017). National Postsecondary Education Cooperative. https://nces.ed.gov/ipeds/pdf/npec/data/npec_paper_new_ipeds_finance_metrics_2017.pdf

McClure, K. R., Orphan, C. M., Fryar, A. H., & Koricich, A. (2021). *Strengthening rural anchor institutions: Federal policy solutions for rural public colleges and the communities they serve.* Alliance for Research on Regional Colleges. https://www.regionalcolleges.org/project/ruralanchor

National Center for Education Statistics (NCES). (2021). IPEDS 2020–2021 data collection system: Glossary. https://surveys.nces.ed.gov/ipeds/public/glossary

Romano, R. M., & Palmer, J. C. (2016). *Financing community colleges: Where we are, where we're going.* Rowman & Littlefield.

Romano, R. M., Kirshstein, R. J., D'Amico, M., & Hom, W. (2016). Adjusting college cost figures for non-credit enrollments. Working Paper 176, Higher Education Research Institute, Cornell University. https://archive.ilr.cornell.edu/sites/default/files/cheri%20wp176.pdf

Romano, R. M., Kirshstein, R. J., D'Amico, M. Hom, W., & Van Noy, M. (2019). Adjusting college costs for noncredit enrollments: An issue for data geeks or policy makers? *Community College Review, 47*(2), 159–177. https://doi.org/10.1177/0091552119835030

RTI International. (2008). *Report and suggestions from IPEDS TRP #22 collecting data on noncredit instructional activity.* https://edsurveys.rti.org/ipeds_trp_docs/prod/documents/trp_22_collecting_data_on_noncredit_instructional_activity.pdf

RTI International. (2021). *Report and suggestions from IPEDS TRP #62: Capturing noncredit enrollment and activity in the IPEDS surveys.* https://edsurveys.rti.org/ipeds_trp_docs/prod/documents/trp62_summary.pdf

Van Noy, M., Jacobs, J., Korey, S., Bailey, T., & Hughes, K. L. (2008). *Noncredit enrollment in workforce education: State policies and community college practices.* American Association of Community Colleges and Community College Research Center.

Voorhees, R. A., & Milam, J. H. (2005). *The hidden college: Noncredit education in the United States.* https://www.voorheesgroup.org/voorheesgroup-pubs/Hidden%20College.pdf

Xu, D., & Ran, F. X. (2015). Noncredit education in community college: Students, course enrollments, and academic outcomes. Working Paper No. 84, Community College Research Center, Columbia University. https://ccrc.tc.columbia.edu/publications/noncredit-education-in-community-college.html

THANK YOU

Authors who submit materials to AIR Publications receive feedback from members of the AIR community. AIR expresses sincere appreciation for the individuals who serve as peer reviewers.

The following individuals reviewed manuscripts recently submitted to *The AIR Professional File*.

Gary Aguayo	Andrew English	Jay Parrent	Karen Vance
Adam Blanford	Nora Galambos	Jessica Shedd	Felix Wao
Timothy Chow	Jessica Ickes	Justin Shepherd	Melinda Whitford
Carley Dear	Jocelyn Milner	Melanie Sullivan	Robert Wilkinson
Brianna Doyle	Vianka Miranda	David Troutman	

ABOUT *THE AIR PROFESSIONAL FILE*

The AIR Professional File features journal-length articles grounded in relevant literature that synthesize current issues, present new processes or models, or share practical applications related to institutional research. All submissions are peer-reviewed. For more information about AIR Publications, including *The AIR Professional File* and instructions for authors, visit www.airweb.org/publications.

Association for Institutional Research
Christine M. Keller, Executive Director and CEO
www.airweb.org
ISSN 2155-7535