The Need for Better Data on Online Program Outcomes

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Executive Summary

As more students enroll in online programs at traditionally in-person colleges and universities, concerns have been raised about the quality of these programs and whether students benefit from this trend. A flashpoint in this discussion is programs powered by so-called online program management (OPM) companies, which provide a range of non-instructional services including recruitment and marketing that help colleges develop and grow their online offerings. [2]Yet there has been little research that has examined the post-college outcomes of students who graduate from online programs—whether supported by OPMs or not—at traditional higher education institutions.

Using a list of OPM-supported programs from more than 100 public and private nonprofit institutions provided by leading companies in the industry, including 2U, Pearson, and Wiley,[3] I set out to evaluate the debt and earnings of graduates of OPM-supported programs versus in-person graduates of similar programs. However, federal program-level data for completions, debt, and earnings make this sort of comparison impossible on a large scale. The key issues are the following:

- Nearly all colleges with online programs powered by OPMs appear to have in-person versions of the same program. Neither Integrated Postsecondary Education Data System data on the number of students who graduate nor College Scorecard data on debt and earnings break down data separately for online versus in-person programs. Completions and outcomes data at the program level need to be separated for in-person versus online programs to allow for accurate comparisons to be made.
- If enrollment in the online version of a program dwarfed enrollment in the in-person version, then it would be more reasonable to use combined outcomes data that currently exist. Yet in the sample of programs across four OPM providers, more students graduated from in-person versions of the program than the online version. This makes it impossible to reasonably analyze the effectiveness of OPMs or likely most online programs at campus-based institutions.
- The federal government requires colleges to identify whether students cannot complete a program online as well as whether students can complete a program online in its data collection queries. This has a key limitation—asking whether students can complete a program online does not clarify whether the program is exclusively offered online. Data

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[2] As used in this report, "OPM" broadly includes companies that host and/or support online courses and programs.

[3] Each of the OPM participants are completely independent third-party providers, unrelated from institutions they support.

collection should be modified to indicate whether on-campus and online versions of the same program exist.

As the number of OPM-supported programs continues to increase, it is crucial to determine whether students and taxpayers are receiving a fair return on their investment relative to on-ground programs. But the above data issues must be addressed before that answer can be determined, and the U.S. Department of Education should take steps to improve data collection in order to make an analysis possible that might guide policy.

Introduction

The share of students participating in online higher education was rising steadily before the coronavirus pandemic forced nearly all students online in 2020. Between 2012 and 2019, the share of undergraduate students taking all classes online rose from 11.3% to 14.8%. Meanwhile, the percentage of graduate students enrolled in fully online programs jumped from 22.0% to 32.6%.[4] Online programs provide convenience and flexibility for students who may not be able to access on-campus programs due to caregiving responsibilities, work schedules, or a lack of options within commuting distance.

In addition to meeting student needs, online programs also meet the needs of many colleges and universities. As concerns about the financial viability of higher education institutions have increased due to challenging local demographics and rising expenses, entrepreneurial colleges started new online degree and certificate programs to serve a broader market and increase revenues. The coronavirus pandemic likely increased this existing trend as colleges were forced to pivot to online instruction in the spring of 2020, simultaneously gaining experience in online education and facing new financial challenges due to pandemic-related losses.

While online programs have expanded access to higher education, there have been concerns about the quality of the education provided and the returns provided to students and taxpayers. Much of the research comparing online to in-person classes finds that in-person classes are associated with better academic outcomes, although it is crucial to also consider that in-person classes may not be an option for many students reached by online education.[5] One research study concluded that students attending colleges that are primarily or fully online generally do not see sufficient earnings increases to cover the tuition that they pay.[6]

Yet prior research generally has not considered the returns to attending online programs at colleges that also offer a substantial number of in-person programs. This is an area of rapid growth in higher education, with a substantial portion of the growth being driven by programs supported by online program management (OPM) companies. OPMs typically provide a range of administrative and other services, often in exchange for a share of future tuition revenue, allowing colleges to rapidly scale up online offerings without large upfront expenditures.[7] There have been concerns raised within the higher education community about the value of OPMs, and

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[4] Author's calculation using tables from the U.S. Department of Education's Digest of Education Statistics reports.

[5] For summaries of the literature, see Baum, S., & McPherson, M. (2019). The human factor: The promise and limits of online education. *Daedalus, 148*(4), 235-254 and Ortagus, J. C., & Derreth, R. T. (2020). "Like having a tiger by the tail": A qualitative analysis of the provision of online education in higher education. *Teachers College Record, 122*(2), 1-32.

[6] Hoxby, C. M. (2018). Online postsecondary education and labor productivity. In C. R. Hulten and V. A. Ramey (Eds.), *Education, skills, and technical change: Implications for future US GDP growth* (pp. 401-460). University of Chicago Press.

[7] While revenue sharing is customary, there are other OPM arrangements in which colleges pay a fixed fee instead of or in addition to a share of revenue.https://www.holoniq.com/notes/594-universities-established-an-opm-bootcamp-or-pathways-partnership-in-2021/ .

three Senate Democrats recently sent a letter to several large OPM providers requesting more information about their business models and student outcomes.[8]

A key policy question is whether online credential programs from colleges that have traditionally focused on in-person programs have value to students and taxpayers. Yet given the way that the federal government currently collects data on student enrollment and outcomes at the program level, this crucial analysis is extremely difficult to conduct at this time. In this report, I detail the limitations of current data sources and propose a path forward that would allow for valid comparisons between online programs and other alternatives.

About Program-Level Data

Although there are multiple sources of program-level data that are currently available from the U.S. Department of Education, these data sources define programs and institutions in different ways. Combined with substantial limitations in how the modality of programs is identified in federal data, there are numerous challenges created in trying to identify the outcomes of fully online programs in higher education. This section provides a primer on program-level data and some of the key limitations of existing data with respect to online programs at institutions that offer a mix of online and in-person instruction. The most important takeaway of this section is that it is often impossible to separate the outcomes of online and in-person programs due to how data are currently collected and reported.

The federal government classifies programs of study using the Classification of Instructional Programs (CIP) taxonomy developed by the National Center for Education Statistics.[9] CIP codes can have up to six digits, with the first two digits specifying the broad field of study, the next two digits specifying a narrower subfield, and the final two digits specifying a precise program of study. For example, CIP code 52.0212 is the six-digit CIP code for retail management. It is nested within the four-digit CIP code of 52.02 (business administration, management, and operations) and the two-digit CIP code of 52 (business, management, marketing, and related support services). Notably, colleges determine which CIP codes their programs are classified under, meaning that colleges may choose to classify the same program of study under different CIP codes.

The U.S. Department of Education collects program-level data using two different sources. The first is the Integrated Postsecondary Education Data System (IPEDS), which collects data from institutions on enrollment, completions, finances, and a range of other topics. Most data collected are at the institution level, but there are two relevant data elements that are collected at the program level. The first is the number of students who completed a program within each six-digit CIP code and credential level. This metric can be used as a proxy for whether a program is in operation in a given year as well as showing which programs students complete.

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[8] Vasquez, M. (2022, January 14). Online program management firms are thriving. And these Democrats want answers. *The Chronicle of Higher Education*. https://www.chronicle.com/article/online-program-management-firms-are-thriving-and-these-democrats-want-answers.

[9] For more information, see https://nces.ed.gov/ipeds/cipcode/default.aspx?y=56.

The other IPEDS data element is the extent to which programs of study within a six-digit CIP code can be completed via distance education. Beginning in the 2019-2020 award year, colleges were asked to report whether none, some, or all programs within that CIP code can be completed via distance education. Prior to this period, colleges were asked how many programs they had within a CIP code and how many could be completed via distance education. Neither of these classification schemes clearly specifies whether all programs in a CIP code can only be completed through distance education, which would be required in order to tell the modality of each of the programs sharing the same CIP code. This is important as colleges occasionally indicate the presence of multiple programs within a six-digit CIP code by indicating that some programs can be completed through distance education.

The second source of program-level data is the College Scorecard, which contains debt and earnings information (collected through the Department of Education and its partner federal agencies) for graduates of individual programs. Notably, the Scorecard defines programs differently than IPEDS in ways that make harmonization with IPEDS data challenging.[10] One challenge is that colleges report IPEDS data at the UnitID level, which is more along the lines of what is generally considered to be an individual college or university. Scorecard data are available at the OPEID level, which often combines multiple institutions together in the case of systems of higher education.[11] For example, the University of Wisconsin and Indiana University systems have separate OPEIDs for each UnitID, while the Rutgers and Ohio State University systems share the same main OPEID for reporting across the system in spite of having separate UnitIDs for each branch campus.[12] This means that debt and earnings outcomes are combined across multiple colleges at many public university systems and at some private colleges with branch or satellite campuses.

The other harmonization issue is that Scorecard debt and earnings data are reported at the four-digit CIP level, which requires rolling up programs that are reported in IPEDS at the six-digit CIP level. The Department of Education decided to report program-level data using four-digit CIPs in order to report data for as many students as possible. The Department did this even though one previous federal data collection effort (the 2017 reporting of gainful employment metrics, which primarily affected for-profit colleges) was at the six-digit CIP level. In 2018, just over 15% of all four-digit CIP codes in IPEDS contained multiple six-digit CIP codes; including the cases with multiple UnitIDs within one main OPEID further increases the share of observations for which College Scorecard outcomes data combines multiple programs.[13] These

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[10] Another issue is that the College Scorecard combines two graduating cohorts in their debt and earnings data reporting, while IPEDS reports individual cohorts. This is arguably less of a concern than the issues described here, but is still worth noting nonetheless.

[11] This is indicated by the last two digits of the OPEID. If the digits are 00 and no other institution has the same first 4-6 digits, then the OPEID is perfectly aligned to an IPEDS UnitID. If the last two digits are 00 and another institution has the same first 4-6 digits, then that institution is a parent institution. If the last two digits end in 01 through 99, then that institution is a child institution of the parent.

[12] Kelchen, R. (2019). Merging data to facilitate analyses. *New Directions for Institutional Research, 181*, 59-72.

[13] Blagg, K., Blom, E., Kelchen, R., & Chien, C. (2021). *The feasibility of program-level accountability for higher education.* Urban Institute.

additional data collapses make it even more challenging to identify programs that are fully online.

OPM Study Sample

Due to the limitations in IPEDS data discussed in the previous section, there is no way to accurately identify fully online programs at colleges that also offer in-person programs. This means that any analyses comparing online programs to other programs must identify their treatment groups using other data sources (such as reviewing institutional websites or getting information directly from institutions) or rely on an IPEDS measure of all programs being able to be completed online that likely includes a mix of online and in-person programs.

I was commissioned to conduct this research by leading OPM providers, including 2U, Pearson, and Wiley, who provided me with a list of programs that OPMs power at their partner institutions. Before I received the dataset, the name of each provider was removed by an intermediary. I was provided information on the name of the college, the credential level of the program, the name of the program, the CIP code (in a majority of cases), and the year which the program began operation. To preserve my independence as a researcher, I had complete control over the data analysis process.

I received a spreadsheet with data on 1,735 programs that were managed by the OPM providers in this project. My first step was to make sure that all necessary data elements to conduct analyses were included. I began by excluding 16 programs for having no credential level listed (typically non-degree-seeking student programs), 27 programs that never launched, and 11 programs for missing data on other necessary elements.

The next step was to fill in six-digit CIP codes based on program names for 461 programs for which OPMs did not receive CIP codes from their partner institutions.[14] I used 2010 CIP codes to harmonize with College Scorecard data, checking the 2020 to 2010 CIP crosswalk to revise a small number of programs that were clearly reported using 2020 CIP codes that differed from the previous classification to their 2010 codes.[15] Among the 1,660 programs from 107 public and private nonprofit institutions that were initially included in the dataset and passed the initial data quality checks, the breakdown of credential levels is the following:[16]

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[14] Because the 461 programs were spread across nearly 30 institutions and many programs started operating several years ago, it was not feasible to make an additional request of colleges to provide CIP codes. Even with excluding these programs or solely focusing on programs for which my assignments of CIP codes perfectly matches College Scorecard data, the key findings of this report are unchanged.

[15] I dropped 21 data science programs because a unique data science CIP code was not added until the 2020 classifications and programs could have used a number of classifications in 2010. The vast majority of these programs were added in the late 2010s, and thus are not the focus of my analysis due to a lack of outcomes data.

[16] I corrected some credential levels in the data that I received. For example, there were a few dozen programs coded as undergraduate certificates that were labeled as graduate certificates in the program name. I made those corrections. Another concern is that educational specialist credentials were often inadvertently coded as master's degrees when the federal government classifies them as graduate certificates. I did not make that change because

Associate: 30
Bachelor's: 493
Undergraduate certificate: 137 (likely includes some graduate certificates that were not marked as such)
Master's: 865 (likely a small overcount due to educational specialist credentials)
Graduate certificate: 79
Doctorate: 53
No level: 3
Total: 1,660

The next sample restriction was to limit to programs that began operating in 2015 or earlier, as this is the time period needed to give enough students a chance to graduate and appear in the College Scorecard debt and earnings data by 2017 (the most recent cohort of data available as of this writing). 560 programs were in existence in 2015, with fully 300 of these programs starting in 2015. Another 72 programs began in 2016 and 100 in 2017, which will increase the sample size once future years of Scorecard outcomes become available.

Here is the credential level breakdown of programs that were operational in 2015:

Associate: 8
Bachelor's: 182
Undergraduate certificate: 43
Master's: 300
Graduate certificate: 18
Doctorate: 9
No level: 0
Total: 560

This led me to focus entirely on bachelor's and master's degrees, as these two credential levels made up the vast majority of all OPM programs that were operational in 2015. This limited the sample size to 482 programs.

The next analytic issue to address was colleges that offered multiple programs within the same six-digit CIP code and credential level within the same OPEID. This issue of multiple programs arose for two reasons. The first was because colleges offered different tracks of the same program. For example, a MS in nursing was listed separately from a BSN to MS in nursing, even though they have the same CIP code and credential level. The second reason was among colleges that had multiple UnitIDs within the same OPEID. If multiple colleges in a system offered the same program through an OPM, they would be combined into one program in the College Scorecard data. This reduced the sample size by nearly one-third, dropping the number of programs from 182 to 135 at the bachelor's degree level and from 300 to 211 at the master's

institutions that had educational specialist programs also had master's programs in the same CIP code and thus would not have affected the number of unique programs included.

degree level. Seventeen colleges had bachelor's programs in the dataset and 44 colleges had master's programs.

To check whether the CIP codes provided were accurate and/or whether the programs actually generated graduates, I merged in data on the number of students who completed credentials (at the six-digit CIP level) between the 2015-16 and 2019-20 academic years from IPEDS. 98 of the 135 bachelor's degree programs and 146 of 211 master's degree programs showed up as having graduates at the six-digit CIP level in IPEDS. The rest of the programs either had CIP codes that were incorrect (through either my coding or through errors in the list of CIP codes provided by the OPM companies) or were from programs that failed to have any students graduate within at least five years of beginning operations (whether on-ground or online).

The next step was to roll IPEDS completions up from the six-digit CIP code level to the four-digit level to match College Scorecard data. In an ideal world for analysis, there is only one program at the six-digit CIP level within each four-digit CIP level because that reduces some of the issues present with rolling up data that I discussed in the previous section. In this sample, approximately two-thirds of six-digit programs (69 of 92 at the bachelor's degree level and 90 of 138 at the master's degree level) were the only program within the four-digit CIP. Overall, 89% of graduates within the four-digit CIP at the bachelor and 81% of graduates at the master's level came from programs within the six-digit CIP of interest.

I then rolled up IPEDS completions data to the four-digit CIP level to merge onto College Scorecard data. At the four-digit CIP level, there were 125 unique bachelor's programs and 182 unique master's programs as some colleges that multiple OPM-fueled programs within the same four-digit CIP. I found IPEDS completions for 113 of the 125 bachelor's degree programs and 158 of the 180 master's degree programs. This suggests that some of the missing programs at the six-digit CIP level were slightly misclassified but were in the correct four-digit CIP code. However, about ten percent of programs (as defined by the four-digit CIP) did not have completions due to programs failing to successfully launch or CIP code classification issues, and it is impossible to fully determine which issue is to blame.

This finally led me to the program-level College Scorecard data. 106 of the 125 bachelor's degree programs and 156 of the 180 master's degree programs showed up at all in the Scorecard dataset, which aligns nicely with the number of programs that had IPEDS completions data. However, not all of these programs were large enough to have reported data on both debt and earnings. I constructed a debt-to-earnings ratio using institutional debt burdens and one-year post-college earnings of students who graduated in the 2015-16 and 2016-17 award years. I was able to calculate ratios for 85 of the 125 bachelor's degree programs and 110 of the 180 master's degree programs, with the remaining programs having too few students receiving federal financial aid for the Department of Education to publish outcomes data. However, as I discuss in the next section, these ratios are not an indicator of the effectiveness of OPM programs.

To get a sense of the distribution of OPM programs across different disciplines, I created six broad CIP groupings: STEM, education, business, health, social sciences, and other. The number of programs with available Scorecard debt and earnings data by credential level are listed below:

STEM (CIP 1, 3, 11, 14, 15, 26, 27, 40, 41): 8 bachelor's, 4 master's

Education (CIP 13): 3 bachelor's, 18 master's

Business (CIP 52): 20 bachelor's, 32 master's

Health (CIP 51): 16 bachelor's, 16 master's

Social sciences (CIP 42, 44, and 45): 14 bachelor's, 19 master's

Other: 24 bachelor's, 21 master's

Findings

All of these steps in the above section suggest that it is feasible to calculate debt-to-earnings ratios for a respectable share of OPM-supported programs, even though the sample sizes for most broad fields of study are currently too small for comparisons. Business and health present the best opportunity for comparisons in the near future, as each field is contained within one two-digit CIP code and there are somewhat larger sample sizes at both the bachelor's and master's degree levels. However, there are a number of issues that make it impossible to reasonably compare the debt and earnings outcomes of online versus in-person programs using federal data. As such, I did not examine the distribution of debt-to-earnings ratios across OPM-supported programs.

First, I examined the measure in the IPEDS completions survey regarding whether all or no programs could be taken entirely via distance education.[17] A surprisingly large share of programs that had debt-to-earnings ratios in the College Scorecard have no programs within the CIP code that can be taken via distance education. In the 2015-16 award year, one in four programs that had an operational OPM in that year with debt-to-earnings ratios were in CIP codes with no fully online programs. This strongly suggests that colleges inaccurately provided data on program modalities to IPEDS, as I was able to match CIP codes to IPEDS completions in a much higher share of cases.

An additional concern is that a large share of OPM programs in my dataset clearly joined another existing program within the CIP code at that institution. This makes intuitive sense, as most OPM agreements do not include the instruction of courses. This means that OPM-fueled programs are easier to start when a program (often in-person at colleges that are not fully online) already exists. In this dataset, approximately 85% of CIP codes with debt-to-earnings ratios awarded degrees two years prior to the OPM being launched. This makes it highly likely that many colleges are offering multiple modalities within the same CIP code. An example of this comes from Norfolk State University, which partners with Academic Partnerships as its OPM provider. The university recently advertised the launch of an online master's in computer science

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[17] To do this, I rolled up responses from the 6-digit CIP level to the 4-digit CIP level. The only responses included here are if each 6-digit CIP code within a 4-digit CIP code reported the same modality in IPEDS.

through Academic Partnerships, while an in-person option has existed for years and only one of the four concentrations is available online.[18]

Without knowing how many students are enrolled in online versus in-person programs within the same CIP code and institution, it is impossible to fully know the potential influence of OPM programs versus in-person programs on reported student outcomes. To get a sense of the size of existing programs and the potential size of OPM-affiliated programs, I examined the number of degrees awarded two years before the OPM program started, the year the OPM program started, and then two and four years following when the program began.

Among OPM programs that began between 2012 and 2015 and had debt-to-earnings ratios in the College Scorecard, increases in degrees awarded were minimal through the year that programs began. As the table below shows, the number of graduates increased two years and four years after OPM-powered programs launched. However, assuming that the entire increase in completions is due to OPMs, these programs make up less than half of all completions within the typical CIP code.

Average Number of Graduates by Time from OPM Start		
Time	Bachelor's (n=78)	Master's (n=92)
t-2	129	93
t	138	97
t+2	162	136
t+4	181	169

It is impossible to determine how much of this increase is truly attributable to launching new online programs, as on-campus enrollment could have also increased over time or students could have shifted from in-person to online options. But based on the available data, it appears that the number of degrees awarded from OPM programs is likely smaller than the number of degrees awarded by previously existing programs within the same institution and CIP code. This means that while OPM programs (and online programs in general at traditionally in-person institutions) certainly influence the debt and earnings that are reported in the College Scorecard, they are likely not the main driver of reported outcomes for many programs.

Conclusion and Recommendations

With the growth in online programs offered by public and private nonprofit institutions that have historically focused on in-person education, it is crucial to understand whether students see a return on investment from these new delivery models. This question is of particular policy relevance at this time due to the scrutiny that OPM providers are facing from some influential individuals within higher education and in Washington. I entered this project with a goal of trying to identify the extent to which OPM-supported programs have benefits to students and taxpayers alike. However, federal data limitations quickly rendered that goal nearly impossible—

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[18] See https://www.nsu.edu/News/2021/November/NSU-Partners-with-Academic-Partnerships and https://www.nsu.edu/cs/ms-computer-science.

and these limitations were far more substantial than I realized in spite of my experience in working with program-level outcomes data.

Because of these limitations, I conclude with five recommendations for improving the quality of program-level data from the federal government and thoughts on constructing appropriate comparison groups for analyses instead of presenting results that show the performance of OPM-supported programs versus non-OPM programs. My data recommendations, which do not necessarily represent the views of any OPM company or university partner, are the following.

Recommendation 1: Clarify the IPEDS completions data regarding distance education. Currently, colleges are asked to report whether no, some, or all programs within each CIP code can be completed through distance education. The meaning of the first two options is clear, but asking whether all programs can be completed online is insufficient. Colleges need to be asked whether all programs in a CIP code can only be completed through distance education, as this would separate programs that have both online and in-person options from programs that are only offered online.

This simple change to reporting would add a minimal amount of burden to institutions in the IPEDS data reporting process and would allow for the presence of solely online programs to be identified. I show in this report that most OPM-powered programs at traditionally in-person institutions likely have in-person programs within the same CIP code. A small change to IPEDS data reporting would confirm these findings and allow for a more systematic look at the prevalence of both in-person and online modalities for the same program of study. Additionally, my findings suggest that colleges may be mistakenly classifying OPM programs as in-person programs as nearly one-fourth of OPM programs with debt-to-earnings ratios were classified as not having fully online options in IPEDS. This area also deserves further review.

Recommendation 2: Provide a breakdown of program-level College Scorecard debt and earnings data by delivery model. In order to answer questions about the effectiveness of online programs (regardless of whether these programs are managed by OPMs or not), it is crucial to have outcomes reported separately for in-person and online programs. From an institutional burden perspective, colleges would have to provide information about whether a student graduated from a program that was online or not. This is not trivial, but it is worth exploring to help answer important public policy questions and ensure the wise use of taxpayer subsidies.

I recommend that the Department of Education consider convening a technical review panel to help make important determinations on this new data addition. One item to consider is how to treat programs that are offered in a hybrid or executive format with limited in-person instruction supplemented with asynchronous or synchronous online instruction. Once a clear line is delineated about what should be considered as an online or in-person program, then institutions can classify programs. Another consideration should be trying to report data on as many students as possible after separating students into online and in-person programs. The Scorecard currently combines two cohorts of students in order to report outcomes for more programs, and it may be worth considering pooling together additional cohorts to counteract sample sizes getting smaller when delivery models are separated.

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Recommendation 3: Provide all program-level data at the IPEDS UnitID level. One of the challenges that this report highlights is the different levels of data reporting between IPEDS and the College Scorecard. At many colleges, the IPEDS UnitID and College Scorecard OPEID levels are identical. Yet for some systems of higher education, each OPEID covers multiple UnitIDs. In those cases, it is impossible to separate the outcomes of programs that are offered at different campuses within the same OPEID—let alone separate the outcomes of online versus in-person programs.

For this reason, it is important for the College Scorecard to report outcomes such as debt, earnings, and student loan repayment at the IPEDS UnitID level. Combined with reporting data separately for online versus in-person programs, this would allow nearly all programs to be properly analyzed at the institutional level. There are two potential concerns with this approach. The first is that sample sizes for some colleges may be too small to report, but this could be partially addressed by combining additional cohorts. The second is that systems may decide to report to IPEDS at the OPEID level through administrative consolidations. This concern deserves further attention and potentially could be addressed through guidance on data reporting.

Recommendation 4: Report completions in IPEDS by distance education status. Currently, all completions within a CIP code are reported together regardless of whether students finish an online or in-person program. Separately reporting completions by distance education status would allow for more information about the establishment and growth of online programs and whether in-person completions change when an online option becomes available. This would create administrative burden for colleges (at least until there is a federal student unit record system that automatically contains the data elements), but the burden should be modest relative to existing reporting requirements by race/ethnicity and gender.

Recommendation 5: Consider providing some guidance to colleges in selecting CIP codes for programs. A final concern in comparing the debt and earnings outcomes across programs is making sure that colleges classify identical programs in the same CIP code to the greatest extent possible. Colleges have substantial latitude in choosing CIP codes, yet no information exists detailing the extent to which colleges put the same program in the same CIP code. This is an area in which research is needed to determine the potential magnitude of this concern, and it may be worthwhile for the Department of Education to convene a technical review panel to suggest solutions.

If these data improvements can be implemented, it will become possible to do a large-scale comparison of the outcomes of students attending online versus in-person programs using publicly available federal data sources. Yet, as a sizable body of research on the effects of online education shows, great care must be taken in selecting comparison groups that are appropriate. These comparison groups also likely differ by the credential level offered, as undergraduate and graduate admissions often work very differently at the same institution. Below are my considerations for selecting comparison groups within the public and private nonprofit sectors.

First of all, online programs rarely seem to attract the types of students seeking to attend the most selective in-person programs. Most online programs at the undergraduate level are targeted

toward students who may already have some credits from prior college experiences and are not straight out of high school. This is not how America's most elite undergraduate institutions function, and as such the comparison group should generally be broader-access institutions that enroll large shares of older and/or transfer students.

However, it is more common to see institutions that are highly selective at the undergraduate level be somewhat less selective at the graduate level. For master's degrees and graduate certificates, the population of students interested in online and in-person options likely overlaps more than for associate or bachelor's degrees. This is not always the case among the most selective graduate programs; for example, Georgia Tech's online master's degree program in computer science primarily serves older, placebound American students while their in-person program serves younger international students.[19] But for part-time students in particular, students likely consider online and in-person programs as potential substitutes if they have in-person programs within commuting distance.

Another consideration is to think carefully about which types of programs should be analyzed together. The most straightforward way to classify programs is by broad CIP codes, which is what I briefly did in this report. This works best at the two-digit CIP code level, but care should be taken to make sure that programs of study within a CIP code generate comparable enough outcomes for comparison. Take education as an example. At the bachelor's degree level, the vast majority of degrees in education are awarded to individuals who plan to teach in K-12 schools. As such, there is no reason to expect inherent differences in outcomes by modality. But at the master's degree level, education degrees can prepare people to teach in K-12 students, work in student affairs positions at colleges, or set individuals on a path to becoming a principal. If online programs disproportionately train higher-paid principals and in-person programs disproportionately train lower-paid teachers and student affairs professionals, then online programs would generate higher earnings than in-person programs just because of the mix of programs.

A final point of consideration for examining debt and earnings by instructional modality is regarding the likelihood of taking a job that would qualify individuals for Public Service Loan Forgiveness (PSLF). PSLF can primarily be accessed by people working in government or nonprofit sector positions, and these positions are also unequally distributed across program of study or delivery model of the program. Debt-to-earnings ratios may be less important for public service-heavy fields when considering the student's perspective, as students hope debt will be forgiven and make up for lower earnings. However, if the focus is from the taxpayer's perspective, then accounting for PSLF may be less important.

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[19] Goodman, J., Melkers, J., & Pallais, A. (2019). Can online delivery increase access to education? *Journal of Labor Economics, 37*(1), 1-34.