



# Identifying Skills Builders and Estimating Economic Returns to Skills-Building Course Sequences: A Research Methodology Guide

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## Overview

Recent research on *skills builders*—students who typically enroll in colleges for a short period of time, take and successfully complete a handful of career-oriented classes, and frequently translate their coursework into earning gains—has generated significant interest from researchers, policymakers, and educators on ways to identify these students in their own institutions and states. This guide provides research methodologies for identifying skills builders and determining the economic returns to short-term course-taking. In addition to providing methodologies for analysis, the guide includes sample discussion questions that community college practitioners can use to build a deeper understanding of student course-taking and its relationship to economic mobility based on the information produced by this analysis.

The guide draws heavily on research presented in the recently published journal article, “Community College Skills Builders: Prevalence, Characteristics, Behavior, and Outcomes of Successful Non-Completing Students Across Four States.”<sup>1</sup>

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<sup>1</sup> Bahr, P. R., Chen, Y., & Columbus, R. (in press). Community college skills builders: Prevalence, characteristics, behavior, and outcomes of successful non-completing students across four states. *Journal of Higher Education*. <https://doi.org/10.1080/00221546.2022.2082782>

# Understanding Skills Builder Students

## Who are skills builders?

By definition, skills builders are a distinct group of community college students who

- Enroll in community college for a short time, typically 1 to 2 semesters
- Take comparatively few course credits (units of for-credit coursework), often attending part-time
- Take classes that are exclusively or mostly in career and technical education (CTE) fields
- Are highly successful in their coursework, with course completion rates and GPAs that tend to be much higher than the overall community college student population

## Why is it important to understand and identify skills builders?

- **Growing enrollment.** Colleges may not be clearly articulating skills building course sequences or their economic value which means that some potential students may not know about these opportunities. Conveying the value of skills building course sequences could help increase enrollment by interested adults as high school-age populations decline.
- **Living wage attainment.** There are many more living-wage job choices and job openings for people who earn bachelor's degrees. It is important to identify ways that adults participating in short-term course-taking can be supported to pursue longer-term education options—particularly given that older students are less likely to complete bachelor's degrees and communities of color are overrepresented at lower educational attainment levels. By examining how skills builder course-taking relates to existing or planned certificates and degrees, colleges can identify on-ramps to longer programs or opportunities for upskilling.

## What has prior research revealed about skills builders?

- Across states, they account for between 1-in-7 and 1-in-9 new community college entrants.
- They are older, on average than the overall community college student population.
- They are disproportionately (but not exclusively) White men.
- They usually leave college without a credential and without transferring to a four-year institution.
- On average, they reap meaningful earnings gains from their short time in college.

## Identifying Skills Builders

In response to widespread assertions from community college faculty, educational leaders, and policymakers that short-term course-taking is sufficient for economic mobility, the University of Michigan conducted a robust analysis of statewide student-level administrative data from California, Colorado, Ohio, and Michigan to identify skills builders. The research team found that skills builders could be identified with a high level of accuracy by focusing on four behaviors: duration of enrollment in community college, the total number of credits attempted, the proportion of credits in CTE fields of study, and credit success rate.<sup>2</sup>

Building on this prior work, the section below describes a methodology that researchers can use for identifying skills builders and information that may be useful to leverage this information for program improvement.

### Methodology for identifying and understanding skills builders

#### 1. Identify a cohort of students.

Identify a cohort of students who can be tracked for a minimum of two years, although three or more years is preferable. All students in the cohort should meet all of the following criteria:

- Prior attendance of a community college: The student has **not** previously attended the institution or (to the extent that it can be determined) any other community college, as indicated by administrative records or self-reports of prior community college enrollment or community college awards.<sup>3</sup>
- Prior attendance of a four-year institution: The student **may** have attended a four-year institution previously and may have been awarded a degree by a four-year institution, but the student was not enrolled in a four-year institution in the year before enrolling in the institution.
- Dual enrollment: The student was **not** a dual-enrolled high school student when first enrolling in community college.

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<sup>2</sup> For a complete description of the analysis, see: Peter Riley Bahr, Yiran Chen, & Rooney Columbus (in press): Community College Skills Builders: Prevalence, Characteristics, Behaviors, and Outcomes of Successful Non-Completing Students Across Four States, *The Journal of Higher Education*.  
<https://doi.org/10.1080/00221546.2022.2082782>

<sup>3</sup> The student **may** have previously attended a private two-year institution or a less-than-two-year institution.

## 2. Identify skills builders in that cohort.

Focusing on the longitudinal records of the student cohort, skills builder students meet **all** of the following criteria:

- Enrolled in community college for  $\leq 6$  academic semester terms
- Attempted  $\leq 35$  semester-equivalent credits
- Proportion of total credits that were in CTE fields of study  $\geq 0.65$
- Overall credit success rate  $\geq 0.79$ , where courses completed with a grade of “D” or better or “Pass” are considered successfully completed

## 3. Disaggregate skills builders by their characteristics.

Among students who meet all of the skills builder criteria, you can disaggregate results by the following criteria:

- Academic discipline (e.g., by department, metamajor, or program in which most credits were taken)
- Prior academic experience (e.g., first time, some college, prior award)
- Educational goal
- Age at college entry
- Gender
- Race/ethnicity

## 4. Identify common courses.

For disciplines in which there are a sizeable number of students, identify

- Common courses taken by skills builders

## Discussion questions on skills builder students and curricular pathways

Pick two different academic disciplines in which you have a sizeable number of skills builder students. For each one, identify the most common skills builder course-taking sequences. Work with discipline faculty and deans to identify if/how those courses are related to certificate and degree programs in the same academic discipline. For each discipline, clarify the characteristics of the skills builder students by comparing them to the overall profile of students at the college, such as by comparing prior education, educational goal, age, gender, or race/ethnicity.

Lead a conversation with questions such as

1. How do the skills builder course-taking sequences differ across the two academic disciplines?
2. Are there factors in our community that make strengthening skills builder opportunities a priority in either discipline?
3. Who are the students in each academic discipline? Are students with particular characteristics more or less prevalent in either academic discipline?
4. Within each academic discipline, do there appear to be different types of adult learners? If so, how could the college address the needs of each group?
5. Which skills builder course-taking sequences are part of a clear progression to certificates, associate degrees, and transfers?
6. How may the college's policies add momentum or create barriers for students who are seeking upskilling opportunities? Are there different momentum points and barriers for different academic disciplines?
7. How do the college's policies add momentum or create barriers for students who are upskilling to transition to a certificate, associate degree, and transfer opportunities? Are there different momentum points and barriers for different academic disciplines?

# Identifying the Economic Returns to Skills Builder Course-taking

Peter Bahr and his research team at the University of Michigan linked student records with wage information from unemployment insurance (UI) databases in Colorado and Ohio to better understand the economic returns to skills builder course sequences. They found that most skills builder students increased their earnings but relatively few were able to translate their course-taking into meaningful economic mobility.

The section below describes a methodology for investigating the economic gains associated with skills builder course sequences. It also provides information that may be useful for identifying ways to leverage this information for program improvement.

## Methodology for identifying economic returns

If you have access to wage data, use the skills builder identification criteria described above to identify skills builders among a cohort of newly enrolled students (or several groups of skills builders in different fields of study). Then, determine which of those skills builders have wage data.

For skills builders with wage data, use the following methodology to estimate economic returns to skills builder course sequences, which presumes that the wage data are measured in quarters.<sup>4</sup>

- For each student, identify the quarter in which the student was last enrolled in college. Refer to this quarter as Q0. The first quarter after the student was last enrolled in college is Q1, the second quarter after the student was last enrolled in college is Q2, and so on through the twelfth quarter after the student was last enrolled in college, which is referred to as Q12.
- Remove from your analysis any student who does not have earnings data in all four quarters from Q1 through Q4 and all four quarters from Q9 through Q12. This will help ensure that your analysis considers only students who are in occupational fields covered in the state's UI database as some occupations are not covered by UI nor is employment in other states.
- Adjust Q1 through Q12 earnings for inflation to a fixed year (e.g., 2019). The Bureau of Labor Statistics provides an [inflation adjustment calculator](#).
- Calculate the sum of each student's earnings in Q1, Q2, Q3, and Q4. Call this Year 1 inflation-adjusted earnings.
- Calculate the sum of each student's earnings in Q9, Q10, Q11, and Q12. Call this Year 3 inflation-adjusted earnings.

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<sup>4</sup> If the college does not have access to the state wage file, you may be able to use earnings reported in alumni surveys.



- For each student, calculate the difference between Year 3 inflation-adjusted earnings and Year 1 inflation-adjusted earnings.
- Calculate the median and mean difference between Year 3 inflation-adjusted earnings and Year 1 inflation-adjusted earnings across all skills builders (or across each group of skills builders).

Determine economic standing using the [MIT Living Wage Calculator](#):

- Select the state and county in which the college is located.
- Identify the threshold wage for 2 children + 2 adults (*both working*). This will be the “medium” economic rung.
- Identify the threshold wage for 2 children + 2 adults (*one working*). This will be the “high” economic rung.
- Annualize these hourly figures by multiplying them by 2080.

Assign the group of skills builders (or each group of skills builders) to a level of economic returns using the mean difference between inflation-adjusted Year 3 earnings and inflation-adjusted Year 1 earnings:

- No return: Year 3 earnings were the same or lower than Year 1 earnings.
- Progress within the low rung: Year 3 earnings were higher than Year 1 earnings, but both Year 3 earnings and Year 1 earnings were below the medium economic rung.
- Moved from low to middle: Year 1 earnings were below the medium economic rung, and Year 3 earnings were at or above the medium economic rung but below the high economic rung.
- Moved from low to high: Year 1 earnings were below the medium economic rung, and Year 3 earnings were at or above the high economic rung.
- Moved from medium to high: Year 1 earnings were at or above the medium economic rung but below the high economic rung, and Year 3 earnings were at or above the high economic rung.
- Progress within the middle rung: Year 3 earnings were higher than Year 1 earnings, and both were at or above the medium economic rung but below the high economic rung.
- Progress within the high rung: Year 3 earnings were higher than Year 1 earnings, and both were at or above the high economic rung.

You also may consider examining the median difference between inflation-adjusted Year 3 and inflation-adjusted Year 1 earnings to determine if a somewhat different assessment of the level of economic returns would result. Using the median difference can reduce the influence of very large earnings gains or very small earnings gains realized by a small number of students (i.e., outlying observations).

Within each category of economic returns, disaggregate results by the following criteria:

- Academic discipline (such as by department, metamajor, or program in which most credits were taken)
- Prior academic experience (first time, some college, prior award)
- Educational goal
- Age at college entry
- Gender
- Race/ethnicity

For disciplines in which there are a sizeable number of students, identify:

- Common course sequences completed by skills builders

## Discussion questions for economic returns

Pick one academic discipline that demonstrates economic mobility between economic rungs and one discipline that has low or no gains. For each discipline, calculate the mean and median change in Year 1 to Year 3 inflation-adjusted earnings. For each discipline, clarify the characteristics of skills builder students by comparing their characteristics to the overall profile of students at the college in terms of prior education, educational goal, age, gender, and race/ethnicity.

Lead a conversation with questions such as

1. How do the economic gains differ across the two academic disciplines?
2. Are there factors in the regional labor market that could influence how much more money students are earning?
3. Who are the skills builder students in the higher-return versus the lower-return disciplines? Why might students with some characteristics have lower representation in higher-return programs?
4. How could we alert students to higher-return course sequence opportunities? How could those outreach efforts address gaps in who is participating in the opportunities?
5. What would we need to do to accommodate more students in higher-return course sequences, such as course scheduling or communications with employer partners?
6. What supports could we provide to students in lower-return programs to help them increase their earnings? Are there opportunities for higher wages if students complete programs in the same discipline?
7. How could we partner with employers and community organizations to strengthen wages in fields that are critical to regional labor markets but do not pay well?