



# USING THE NEW JERSEY STATEWIDE DATA SYSTEM TO EXPLORE EDUCATIONAL PATHWAYS

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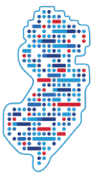
# Abstract

Changing labor market conditions prompted states, educational institutions, and other education and training providers to establish structured pathways for students to achieve academic goals. Degree programs are an important part of these pathways and are the focus of this report. Providing industry-recognized skills that employers value helps align education and training with specific industry needs. Though evidence supporting better economic returns for those who stack postsecondary credentials is mixed, relevant stakeholders, including employers, policymakers, educational institutions, and other credential providers, are increasingly interested in identifying **who** stacks and **how**. This report summarizes the current literature on this topic and discusses possible internal and external data sources for future analyses. This study found that despite data limitations, researchers can use the New Jersey Statewide Data System (NJSDS) to identify both who stacks credited postsecondary credentials at educational institutions in New Jersey as well as how they stack. Leveraging external data sources and semi-structured interviews with administrators would also help illustrate students' experiences pursuing stackable credentials. The preponderance of literature and evidence focus on a mix of degree and non-degree programs; this report, however, primarily focuses on the degree programs in New Jersey as a foundational effort.

## Project Overview and Design

In recent years, states, educational institutions, and other providers have developed stackable credential pathways to address changing student and workforce needs. Stackable credentials — or earning two or more sequential credentials within specific timeframes — help individuals gain industry-recognized skills with fewer hours and at lower cost, enhancing employment prospects and often increasing labor market outcomes. These pathways and programs help align education and training with specific industry needs by providing industry-recognized skills. Evidence showing the exact economic benefit for stackers is mixed. Nevertheless, relevant stakeholders, including employers, policymakers, educational institutions, and other credential providers, are increasingly interested in identifying who stacks and how. This study, therefore, assessed the feasibility of using degree program data to analyze students' experiences in attempting or completing stackable credentials at educational institutions.

Synthesizing the literature on stackable credentials and inventorying available data sources, this report presents a feasibility assessment of using data from NJSDS at the John J. Heldrich Center for Workforce Development at Rutgers, The State University of New Jersey to analyze stackable degree programs, which includes data from the New Jersey Department of Education, the Office of the Secretary of Higher Education, the New Jersey Department of Labor and Workforce Development, and the Higher Education Student Assistance Authority. Additionally, researchers examined external data, such as the Integrated Postsecondary Education Data System and the National Student Clearinghouse, that may assist in future studies on stackable credentials in the state. Researchers demonstrated the feasibility of using NJSDS data and external data sources, and recommend semi-structured interviews with administrators as part of future analyses to better understand students' experiences pursuing stackable credentials in New Jersey.



# Background

Stackable credentials have emerged as an attractive alternative — or, in some cases, a **pathway** — to bachelor’s degrees as labor market conditions and the cost of education have changed in recent years. Educational institutions and other credential providers, primarily driven by efforts at the state level, have created stackable credential pathways to better meet industry needs by helping students gain industry-recognized skills currently valuable to employers with fewer required hours and at lower cost (Anderson & Daugherty, 2021). Stackers are typically defined as students who earn two or more credentials within specific timeframes. Narrower interpretations argue that credentials are stackable when they are “part of a sequence of industry-recognized credentials that can be accumulated over time to demonstrate an individual’s expanded knowledge and competencies, help him or her advance within a career pathway, and enable the learner to earn family-sustaining wages” (Center for Occupational Research and Development & Social Policy Research Associates, 2021, p. 2).

Though they largely depend on the industry, stackable credential pathways can offer for-credit certificates, non-credit certificates, industry certifications, occupational or professional licensing, and badges and micro-credentials (Van Noy, 2023) on the path to associate and/or bachelor’s degrees. Van Noy (2023) summarizes the types of awards and criteria within stackable credential programs, including for-credit certificates, non-degree certificates, industry certifications, occupational or professional licensure, apprenticeships, and badges and micro-credentials.

## Benefits of Stackable Credentials

There are clear advantages to stacking credentials. For students, the advantages are fewer required hours and lower costs (Bozick et al., 2021). Stacking two or more industry-recognized credentials from community colleges and/or vocational-technical schools typically costs substantially less than earning a bachelor’s degree from a four-year institution. For educational institutions, stackable credentials help keep students enrolled and engaged (Center for Occupational Research and Development & Social Policy Research Associates, 2021). Multiple entry and exit points are built into pathways. These ramps help different types of students — especially working adult learners — to pursue stackable credentials alongside life and family circumstances (Bozick et al., 2021).

Stackable credentials interact with programs of study, career pathways, and career exploration in different ways. Figure 1 on page 3 illustrates the various pathways students can take to achieve different milestones, including stackable credentials that fall under both programs of study and career pathways.

For employers, stackable credentials ensure the workforce has in-demand, industry-recognized skills (Bailey & Belfield, 2017; Meyer et al., 2022). Stackable credentials, in addition to benefiting stakeholders, call attention to the limitations of college degrees. As described by Lerman et al. (2019), “College degrees are valuable credentials that document important achievements, but they do not capture the breadth of skills that are valued in the labor market” (p. 19). Stackable credential pathways, as demonstrated above, can help better align education and training with employer needs across industries.



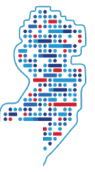


Figure 1: Pathways to Career Readiness and Advancement

# Pathways to Career Readiness and Advancement

*Programs of Study and Career Pathways share many of the same attributes. The two terms are used interchangeably in many state and local applications. Both are defined in Federal Law.*

A **CAREER PATHWAY** is a combination of rigorous, high-quality education, training, and other services.

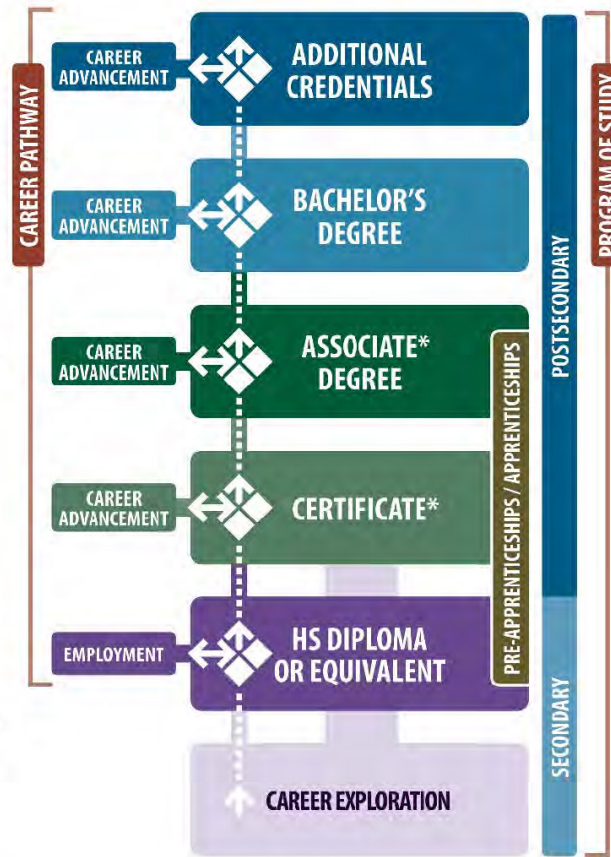
Attributes:

- Industry alignment
- Secondary and postsecondary credential attainment
- Enables entry and advancement in specific occupations or occupational clusters
- Education in the same context as workforce preparation
- Acceleration of educational and career advancement
- Preparation for success in secondary/postsecondary education options and apprenticeships
- Counseling services

A **PROGRAM OF STUDY (POS)** is a coordinated, nonduplicative sequence of academic and technical content at the secondary and postsecondary level.

Attributes:

- Industry alignment
- Postsecondary credential
- Multiple entry/exit points
- Academic, technical, employability skills



## STACKABLE CREDENTIALS

At these milestones the learner may advance to the next-higher-skill job in the sector for which they have trained, and/or continue in or reenter the learning pathway to pursue additional credentials.

\*These stackable credentials *may*:

- Include preparation for **industry certifications**.
- **Articulate** to bachelor's degree programs.
- Be obtainable by HS students through **dual credit**.

## CAREER EXPLORATION

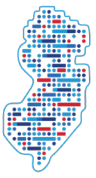
Begins no later than 8th grade and is an integral part of instruction for:

- Career and Technical Education (CTE)
- Integrated Education and Training (IET)
- Adult Basic Education (ABE)
- Adult Secondary Education (ASE)
- English as a Second Language (ESL)

Source: Center for Occupational Research and Development & Social Policy Research Associates (2021).

## Credential Quality Considerations

Quality concerns have emerged in recent years. Van Noy (2023) argues that the design, competencies, outcomes of value, and market processes of a non-degree credential greatly affect quality. Van Noy (2023) developed three categories — **high-quality**, **low-quality**, and **undervalued** credentials — that help explain why some non-degree credentials are more successful than others. Van Noy (2023) describes high-quality credentials as those that are designed well and provide industry-recognized skills that produce valuable education and employment outcomes for individuals and society. On the other hand, Van Noy (2023) posits that undervalued credentials can be designed well and/or develop critical competencies but may not be valued by the current labor market. Without crucial elements associated with high-quality credentials, Van Noy (2023) argues that non-



degree credentials may not help students gain what they need or benefit employers and the overall labor market. Therefore, educational institutions and other credential providers must focus on providing high-quality credentials. When taken together, these categories can help understand how processes and outcomes affect the quality of credentials that can then be stacked with other credentials or degrees.

Others question the skills-based hiring movement, arguing that it overlooks the benefits of earning college degrees. A 2023 *New York Times* article emphasizes that premiums still exist for students who earn a bachelor's degree and significantly increased earnings (Wildavsky, 2023). The Heldrich Center recently validated these findings, showing that New Jersey graduates with bachelor's degrees often earn more than those without bachelor's degrees, even after accounting for offsetting opportunity costs and the cost of education (Simone et al., 2023). The *New York Times* article provides additional evidence suggesting that supervisors and human resources professionals may remain unconvinced that skills-based credentials provide the same competencies as college degrees, arguing that students who pursue four-year degrees develop "analytical and communications abilities, tailored to popular subjects...that have significant long-term benefits" (Wildavsky, 2023). The article acknowledges, however, that credentials, especially those combined with college degrees (e.g., stacking), work for many students.

## Measuring Stackable Credentials

Those who pursue stackable credentials are typically categorized as stack **attempters** or stack **completers**. Some studies differentiate between natural and non-natural stackers by identifying industry clusters through a Classification of Instructional Programs code family (Meyer & Castleman, 2022).

Researchers use administrative data, surveys, and other data sources to identify students who earn their first credential and enroll in another credential or degree program but do not complete within specific time frames (stack attempters). Students who enroll and complete another credential or degree program after completing their first credential are defined as **stackers** or stack completers. Among those who complete stackable credentials are students who earned two or more credentials in the same industry cluster (natural stacker) and those who earned two or more credentials in different industry clusters (non-natural stacker). The healthcare industry, for example, has well-established stackable credential pathways across educational institutions and other credential providers (Bozick et al. 2021; Daugherty et al., 2023b; Meyer & Castleman, 2022). Students who complete their first credential in health care and later enroll in and complete their second credential through an associate degree in nursing are considered natural stackers.

There are different ways to study stackable credentials. Meyer and Castleman (2022), for example, focus on stack attempters and stack completers among older working adults. Bozick et al. (2021) examine three factors affecting whether students reenroll to pursue another credential or degree program: institutional context, opportunity cost, and labor market outcomes. Though 61% of students who completed one credential pursued another credential or degree program, the type of institution (e.g., vocational-technical college, community college, four-year college or university) shapes student progression, and students assess the short- and long-term costs of enrolling, as well as unemployment rates and other labor market conditions. In addition to collecting an inventory of career education programs that include stackable credentials in the California Community College System, Bohn and McConville (2016) analyze stacking progression. Students attempting to stack may earn higher-level credentials (progressive) or interconnected credentials (lattice). This study found that one-fourth of short-



term certificate earners obtained another credential within three years and identified specific benefits for Latino students who stack. These findings suggest that stackable credentials may help narrow achievement gaps and high-poverty rates for Latinos in California and elsewhere.

## **Economic Returns of Stackable Credentials**

Recent studies have turned to analyzing the economic returns associated with stackable credentials. These studies often show mixed results (Meyer et al., 2022). Daugherty et al. (2021) examine employment outcomes for stackers in Ohio within specific industries, such as health care, manufacturing, and information technology, emphasizing certificates and credential length. This study examined three different certificates: non-credit certificates, short-term credit-bearing certificates, and a long-term certificate.<sup>1</sup> Daugherty et al. (2021) found that the number of students earning certificates increased over time, with most stacking occurring at community colleges, and that earnings increased for students who stacked higher credentials; however, the percentage of stackers and the extent of increased earnings varied by demographic characteristics. Though the study highlighted the need to strengthen stackable credential pathways and provide additional support for cross-institutional efforts and non-credit opportunities, Daugherty et al. (2021) emphasize that more research needs to be conducted to better understand the value of stacking credentials.

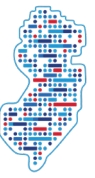
A follow-up study conducted by Daugherty et al. (2023a) analyzes evidence from both Colorado and Ohio on the economic returns associated with stacking credentials across demographic characteristics. Using an equity perspective, this study found that, though stackable credentials were designed for those “underserved by traditional degree programs, including low-income individuals, older individuals, and individuals of color,” adult learners and students of color are less likely to benefit from stacking credentials (Daugherty et al., 2023a, p. v). Recently published research (Daugherty et al., 2023b; Daugherty et al., 2023c) outlines the importance of scaling stackable credential pathways in ways that advance equity and ensuring that low-income individuals and other historically underserved groups can obtain clear information on stackable credentials, especially the associated labor market value. Daugherty et al. (2023c) also emphasize the need to support the non-credit to credit movement, including collecting better data on non-credit programs.

## **Stackable Credential Data**

Studies referenced in the previous section of this report demonstrate the abundance of administrative data on stackable credentials across the United States, as shown in Table 1. Both California and Ohio have educational institutions with robust stackable credential pathways and rich administrative data. The Ohio Longitudinal Data Archive, for example, houses data from the Ohio Department of Higher Education’s Higher Education Information System, Ohio Technical Centers data, and Ohio’s Unemployment Insurance system. These data sources combined contain demographic, enrollment, completion, and labor market information necessary for studying stackable credentials in the state. California uses similar administrative data sources to examine stackable credentials, namely the Chancellor’s Office Management Information System from the California Community Colleges’ Chancellor’s Office. Though researchers increasingly use administrative data, studies also leverage other public data sources such as the U.S. Bureau of Labor Statistics; longitudinal surveys, including the Education Longitudinal Survey, Survey of Income and Program Participation, and the National Longitudinal Survey of Youth; and private data sources, such as the National Student Clearinghouse (Bailey & Belfield, 2017).

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<sup>1</sup> Short-term certificates take less than one year to complete, while long-term certificates take at least one year of full-time enrollment.



Many studies examine enrollment, completion, and labor market outcomes across demographic characteristics. In addition to race, gender, age, and income level, studies also examine parental education, economic and academic disadvantage, living circumstances, and zip code. The period examined largely depends on what administrative datasets contain, but most studies follow stackers between three and six years after they complete their first credential. When studies analyze labor market outcomes, researchers typically account for at least two years (or eight quarters) of Unemployment Insurance wage records. For example, Bozick et al. (2021) analyzed students in Ohio who completed two or more credentials between the 2004-05 and 2018-19 academic years. Sample size also depends on the state and timeframe. California has an enormous higher education system, while Ohio, Michigan, and North Carolina have smaller education systems (Bailey & Belfield, 2017).

This literature review, as stated earlier, encompasses both degree and non-degree programs. Yet this report focuses exclusively on degree programs and functions to help better understand the role that stacking degrees play in career advancement.

Table 1: Snapshot of Data Sources Used in Stackable Credentials Literature

Data Source	Unique ID	Enrollment	Completion	CIP Code	Demographics	Employment
California Community Colleges' Chancellor's Office Management Information System	●	●	●	●	●	
Colorado Community College System	●	●	●	●	●	
Colorado Unemployment Insurance	●			●	●	●
North Carolina Community College	●	●	●	●	●	
Ohio Department of Education	●	●	●	●	●	
Ohio Department of Job and Family Services	●			●	●	●
Ohio Longitudinal Data Archive	●	●	●	●	●	●
Ohio Department of Higher Education's Higher Education Information System	●	●	●	●	●	
Ohio Technical Center	●	●	●	●	●	
Ohio Unemployment Insurance	●			●	●	●
Virginia Community College System	●	●	●	●	●	
Virginia Employment Commission	●			●	●	●
Education Longitudinal Survey	●	●	●		●	
Integrated Postsecondary Education Data System	●	●	●	●	●	
National Longitudinal Survey of Youth	●	●	●	●	●	●
National Student Clearinghouse	●	●	●	●	●	
Survey of Income and Program Participation	●			●	●	●



## Stackable Degrees in New Jersey

There have been notable efforts in recent years to create, implement, and strengthen stackable credential pathways at educational institutions in New Jersey. Under the Securing Our Children's Future Bond Act (P.L. 2018, c. 119), the County College Career and Technical Education Expansion Grants help vocational-technical schools establish stackable credential pathways and programs to promote specific industry clusters, including advanced manufacturing; health care; technology, transportation, and logistics; construction and utilities; culinary and hospitality; biotechnology, pharmaceuticals, and medical technology; and other industries (Office of the Secretary of Higher Education, 2021). The purpose of these expansion grants is to support "industry-recognized, short-term credentials and certificates that count toward a higher-level certificate or degree, so that individuals may advance in employment and training over the course of their careers" (Office of the Secretary of Higher Education, 2021, p. 5). Six vocational-technical school districts received grant funding in 2019<sup>2</sup> and are required to partner with employers, industry associations, employers, labor unions, high schools, colleges and universities, and state government. Additionally, grant recipients must develop maps focused on dual enrollment, prior learning assessments, industry-valued credentials, and credit and non-credit pathways. Grant recipients must also provide multiple on-ramp and exit opportunities and incorporate registered apprenticeship models.

This section examined stackable credentials and discussed existing studies on students who stack credentials in pathways and programs at educational institutions and other credential providers across the United States. By reviewing the recent literature, researchers found that studies largely focused on states with robust stackable credential pathways. These studies use administrative data from educational institutions and how, prompting other researchers to use Unemployment Insurance wage records to assess labor market returns associated with stacking credentials. The following section discusses the feasibility of conducting similar studies using NJSDS data on stackers in New Jersey.

## Data Review

Researchers examined datasets and tables from the New Jersey Department of Education, the Office of the Secretary of Higher Education, the New Jersey Department of Labor and Workforce Development, and the Higher Education Student Assistance Authority. These sources include enrollment and completion data from career and technical education programs, non-credit training facilitated by eligible training providers, and credited programs of study. Additionally, researchers analyzed external data sources, such as the Integrated Postsecondary Education Data System and the National Student Clearinghouse. This part of the study involved exploratory gap analyses of each data source whereby researchers identified whether they contained unique identifier, enrollment, completion, Classification of Instruction (CIP) code, and demographic data. Table 2 shows that most data sources reviewed contain key elements for conducting analyses on stackable credentials in New Jersey.

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<sup>2</sup> The 2019 grant recipients include Burlington County Institute of Technology, Cape May County Vocational-Technical School District, Hunterdon County Vocational School District, Passaic County Technical-Vocational School District, Salem County Vocational-Technical School District, and Somerset County Vocational-Technical School District.



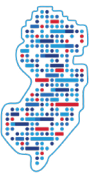


Table 2: Key Elements of Each Data Source

Data Source	Unique ID	Enrollment	Completion	CIP Code	Demographics
New Jersey Department of Education	●	●	●	●	●
New Jersey Department of Labor and Workforce Development	●	●	●	●	●
Office of the Secretary of Higher Education	●	●	●	●	●
Higher Education Student Assistance Authority	●	●			
Eligible Training Provider List	●	●	●	●	●
Integrated Postsecondary Education Data System		●	●	●	●
National Student Clearinghouse	●	●	●	●	●

### Feasibility of Stackable Credential Study: Incorporating Non-Degree Data

Within New Jersey, there are sufficient data to conduct an analysis on the educational experiences of students who stack credentials. Researchers can primarily leverage the Eligible Training Provider List data and Office of the Secretary of Higher Education database — including enrollment, completion, and CIP tables — to identify stack attempters and stack completers, with additional disaggregation of natural and non-natural stackers among those who complete stackable credentials. Because recent efforts to create stackable credential pathways have focused on registered apprenticeship models at the county college level, future analyses can also use Registered Apprenticeship Partners Information Database System data to track students who earn credentials through federally registered apprenticeships in New Jersey.

Other opportunities to analyze additional information may arise as more data become available in NJSDS. Researchers are currently limited, for example, in examining Prior Learning Assessment credits, whereby students can complete non-degree credentials before enrolling in postsecondary institutions. Existing data only include accumulated credits or credits earned at enrollment, which often overlaps with transfer students and those who took college-level courses in high school. While future studies may explore this field to determine past enrollment experience, these data points do not provide any indication that students intend to stack their credentials and/or degrees. In addition, inclusion in current enrollment does not indicate that they “count” toward degree completion requirements. If, in the future, additional course-level data were added to NJSDS, particularly transcript data, researchers could better understand the nature of non-degree credentials prior to enrollment in postsecondary institutions.

Researchers also assessed the years of available data, as shown in Figure 2. An initial exploration of identifying stackers using Office of the Secretary of Higher Education data, starting with those completing a credit-bearing, less-than-two-year certificate, is presented in Appendix A.



Figure 2: Years of Available Data

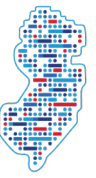
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	
New Jersey Department of Education	K-12 Career and Technical Education Data																													
	Office of the Secretary of Higher Education																													
	Semesterly Enrollment Data																													
	Transfer Data																													
	Completion Data																													
New Jersey Department of Labor and Workforce Development	Apprenticeships																													
	Education and Training Provider List																													
Higher Education Student Assistance Authority	Financial Aid Records																													
	Program Data																													

Source: <https://njds.nj.gov/data/data-access/>

## Analytical Discussion

Though researchers are well equipped to analyze the educational experiences of stackers, there are still data limitations that constrain conclusions that researchers can draw from a future study on stackers. Researchers cannot use NJSDS data to track individuals who earn their first credential at an educational institution in New Jersey and complete their second credential or degree program in another state. Future analyses, paired with other New Jersey data sources, the Integrated Postsecondary Education Data System, and National Student Clearinghouse data, can also attempt to track individuals who earn their first credential at an educational institution in New Jersey but enroll and complete their second credential or degree program in neighboring states, such as New York or Pennsylvania.

It is also well documented throughout the literature that educational institutions do not collect quality data on non-credit programs (Daugherty et al., 2021). Missing information on non-credit programs limits the ability of researchers using these data to examine students who complete non-credit programs that may not be reported on the Eligible Training Provider List. As previously stated, NJSDS does not currently contain course-level data that could shed light on non-credit programs prior to enrollment, such as Prior Learning Assessment credits. In the future, the enrollment and exit data within the Eligible Training Provider List can be combined with other data sources — specifically, New Jersey Department of Education and Office of the Secretary of Higher Education — to expand the starting cohort and track students across educational and employment outcomes.



Another limitation stems from distinguishing between natural and non-natural stackers and the methodology applied to do so. The literature is largely divided on the definition of stackable credentials. Some define stackable credentials as completing two or more credentials, whereas others have narrower interpretations that stackable credentials must be completed within the same industry cluster. Adopting the narrower definition can discount individuals who earn two or more credentials in different industry clusters but nonetheless gain valuable skills that help improve their employment prospects and labor market outcomes. An individual may earn their first credential in applied mathematics, for example, and then obtain an associate degree in architecture. Though these fields are arguably related and highly intertwined, the commonly applied methodological approach would label these individuals as non-natural stackers because applied mathematics and architecture have different two-digit CIP code families. This theoretical framework and subsequent methodological approach limit how researchers can capture natural and non-natural stackers.

Additionally, the literature demonstrated that conducting semi-structured interviews with program directors as well as representatives from the following organizations would prove beneficial:

- ▶ County College Career and Technical Program Expansion Grants,
- ▶ New Jersey Apprenticeship Network,
- ▶ New Jersey Council of County Colleges' Building Pathways initiative,
- ▶ New Jersey Council of County Vocational-Technical Schools, and
- ▶ Rutgers Stackable Business Innovation Program.

Interviews with these stakeholders and others identified by subject-matter experts would add important distinctions to conclusions drawn from the data.

## Future Implications

This review found that it would be feasible to use existing and available data to analyze stackers in New Jersey. The Heldrich Center can leverage NJSDS to replicate similar studies on stackable credentials, including who stacks and how, as well as the progression of stacking. This study, though largely quantitative, would benefit from semi-structured interviews with key stakeholders. These interviews, which would include subject-matter experts from councils, educational institutions, and other credential providers, would add important nuance to NJSDS data, especially around how to strengthen stackable credential pathways and programs in the state. In New Jersey, the Eligible Training Provider List encompasses a much larger universe than are included in most other states. Future analyses will build on the exploratory analysis presented in Appendix A by incorporating the Eligible Training Provider List to track students who earn credentials at other credential providers, including non-degree programs and other potential pathways not currently captured by the Office of the Secretary of Higher Education. These analyses will also include an in-depth assessment of accumulated credits and their relationship with enrollment in associate or bachelor's degree programs.



# Appendix A: Exploratory Analysis of Higher Education Data

This study included an exploratory analysis of stackers in New Jersey by identifying stack **attempters** and stack **completers** from data within the New Jersey Statewide Data System, specifically credit-bearing degree programs reported to the Office of the Secretary of Higher Education. Because the New Jersey Statewide Data System does not yet contain Eligible Training Provider List data, this exploratory analysis only includes stackable credentials identified within the Office of the Secretary of Higher Education records. Future analyses will benefit from inclusion of the Eligible Training Provider List data to identify those completing non-credit training prior to enrolling in credit-bearing degree programs.

Researchers categorize credited degree program stack attempters as students who completed one degree and enrolled in another degree program but did not complete, and stack completers are those who completed one degree between 2004 and 2014 and completed a second degree program up until 2022. The first 10-year period allows researchers to capture enough stackers, and the following eight years provide sufficient time to track additional educational attainment, but specifically, sequential credentials or degrees. In addition to adding non-degree programs, future analyses will also limit the time period between program enrollment and completion, and explore the feasibility of identifying formal stacking programs indicating programs that are designed to facilitate stacking.

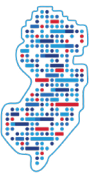
Researchers then examined natural and non-natural stackers among those who completed stackable credentials. Natural stackers are identified as students who completed two or more credentials within the same two-digit Classification of Instruction (CIP) code, which is typically associated with industry. Though natural stackers are more common in the current literature, researchers also found it important to examine those who earned two or more credentials in different majors. Table A-1 provides descriptions for the types of students included in the exploratory analysis.

**Table A-1: Defining Stackers and Non-Stackers**

Term	Definition
<b>Non-stackers</b>	<b>Students who earned their first credential between 2004 and 2014 but did not enroll in a secondary credential as of 2022</b>
<b>Stack attempters</b>	<b>Students who earned their first credential between 2004 and 2014 and enrolled in a secondary credential or degree program but did not complete as of 2022</b>
<b>Stack completers</b>	<b>Students who earned their first credential between 2004 and 2014 and enrolled in and completed their second credential or degree program as of 2022</b>
<b>Natural stackers</b>	<b>Students who completed stackable credentials in the same two-digit CIP code family between 2004 and 2022</b>
<b>Non-natural stackers</b>	<b>Students who completed stackable credentials in different two-digit CIP code families between 2004 and 2022</b>

*Note: Researchers limited the cohort to students who earned an award less than an associate degree as their first credential.*





Given the available data, researchers conducted an exploratory analysis of those who stacked credit-bearing degrees in New Jersey, focusing on students who obtained an award less than an associate degree as their first credential. Though this provides a limited snapshot of the data that would be included in future analyses, the preliminary findings provide an important snapshot of stackers in the state. This report lays the groundwork for future analyses to expand the cohort of stackers and increase the scope of the analysis.

To better understand stackable credentials in New Jersey, researchers conducted an exploratory analysis of students with an award less than an associate degree as their first credential between 2004 and 2014 and tracked subsequent enrollment and completion of their second credential through 2022. The exploratory analysis revealed that, out of the 13,342 students who earned a less-than-two-year award as their first credential between 2004 and 2014, 94% enrolled in another credit-bearing degree program (State of New Jersey, 2023). Among those who pursued a second degree, 43% completed stackable credentials by 2022. Slightly more than half of these students completed stackable credentials within the same two-digit CIP code family (52%), while others were non-natural stackers (48%).

**Table A-2: Number of Stackers and Non-Stackers**

Type	Number of Students
<b>Non-stackers</b>	<b>802</b>
<b>Stackers</b>	<b>12,540</b>
Stack attempters	<b>7,146</b>
Stack completers	<b>5,394</b>
<b>Natural stackers</b>	<b>2,827</b>
<b>Non-natural stackers</b>	<b>2,567</b>

This initial review also revealed variation in the fields for which students may be more likely to stack. Most students who complete a less-than-two-year certificate are in either health (44%) or social science (34%). Exploring the program areas more closely, nursing, criminal justice and corrections, and dental support services had the largest number of natural stackers. Table A-3 shows the proportion of the original cohort — those who completed a less than two-year certificate — by their program area and whether they went on to complete a subsequent degree. For each high-level group, most students attempted to but did not complete a subsequent credential, while a high share went on to complete another degree either within (natural) or outside (non-natural) their original field. In comparison to others completing an initial certificate in the field, those in business and science, technology, engineering, and mathematics were most likely to become natural stackers.

**Table A-3: Post-Certificate Educational Experiences, by Program Area**

Term	Completers		Non-Completers	
	Natural Stackers	Non-Natural Stackers	Stack Attempters	Non-Stackers
<b>Business</b>	<b>28%</b>	<b>12%</b>	<b>51%</b>	<b>8%</b>
<b>Education</b>	<b>18%</b>	<b>34%</b>	<b>48%</b>	<b>0%</b>
<b>Health</b>	<b>21%</b>	<b>13%</b>	<b>61%</b>	<b>5%</b>
<b>Humanities</b>	<b>16%</b>	<b>28%</b>	<b>53%</b>	<b>4%</b>
<b>Science, Technology, Engineering, and Mathematics</b>	<b>26%</b>	<b>21%</b>	<b>43%</b>	<b>10%</b>



Future analyses can expand on this by examining **who** stacks by race/ethnicity, gender, age, and other demographic characteristics, as well as **how** individuals stack. Researchers can use existing NJSDS data to identify the percentage of students who stack **progressively** or follow a **lattice** pathway. Additional analyses can also help identify the most common industry clusters (e.g., two-digit CIP code families) for stackable credentials in New Jersey. In addition, future analyses will provide additional details regarding the credential type. With the inclusion of non-degree programs, this will include those programs as well as whether individuals go on to earn a subsequent certificate, associate degree, or bachelor's degree, and the time between those enrollments and completions.

Researchers identified several limitations associated with this exploratory analysis. Researchers limited the cohort to those who earn a less-than-two-year award as their first credential (e.g., certification). The stacking experience of students who earn an associate degree as their first credential is likely different. In addition, researchers identified some students with more than one associate or bachelor's degree award in different majors. These students appear as both natural and non-natural stackers. One possible explanation is that students earned their first and second credentials within the same industry cluster but completed another credential outside of that two-digit CIP code family. Future analyses should investigate these students' experiences further, including sub-group analyses of those who complete multiple degrees.

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## About the New Jersey Statewide Data System

The **New Jersey Statewide Data System (NJSDS)** is the State of New Jersey's centralized longitudinal data system for education and workforce data. Its mission is to safely use the state's existing administrative data for evidence-based policymaking. Developed in 2012 through a grant from the U.S. Department of Education, NJSDS creates a single place where state education, postsecondary education, employment, and workforce longitudinal data are securely stored to help stakeholders make data-informed decisions to improve student learning and labor market outcomes. The data system is owned by the State of New Jersey and operated by the John J. Heldrich Center for Workforce Development at Rutgers, The State University of New Jersey. NJSDS is a collaboration between the New Jersey Office of the Secretary of Higher Education, the New Jersey Department of Labor and Workforce Development, the New Jersey Department of Education, and the New Jersey Higher Education Student Assistance Authority.

## About the Heldrich Center for Workforce Development

The **John J. Heldrich Center for Workforce Development** at Rutgers University is devoted to transforming the workforce development system at the local, state, and federal levels. The center, based at the Edward J. Bloustein School of Planning and Public Policy, provides an independent source of analysis for reform and innovation in policymaking and employs cutting-edge research and evaluation methods to identify best practices in workforce development, education, and employment policy. It is also engaged in significant partnerships with the private sector, workforce organizations, and educational institutions to design effective education and training programs. It is deeply committed to assisting job seekers and workers attain the information, education, and skills training they need to move up the economic ladder.

As captured in its slogan, "Solutions at Work," the Heldrich Center is guided by a commitment to translate the strongest research and analysis into practices and programs that companies, community-based organizations, philanthropy, and government officials can use to strengthen workforce and workforce readiness programs, create jobs, and remain competitive. The center's work strives to build an efficient labor market that matches workers' skills and knowledge with the evolving demands of employers.