Workforce Data Quality Initiative Report No. 1 for Wyoming

School Attendance and Employment, 2006 to 2013

Research & Planning
Wyoming DWS

April 2015

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"Your Source for Wyoming Labor Market Information"

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Funding of this Research

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Chapter 1: Introduction

by: Michele Holmes, Public Relations Specialist

This report is the first of its kind produced by the Research & Planning (R&P) section of the Wyoming Department of Workforce Services, and represents an attempt to describe, in statistical form, the numbers of high school students working in Wyoming and what they earn, on average. The datasets and applications that make this report possible are developed by R&P and described in detail in Chapter 4. The data and methodology outlined in this report are important because they represent a new set of tools that have the potential to address education and workforce policy issues which have been at the forefront of the national discussion for several decades.

R&P has been involved in education research for more than 20 years, and seeks to place empirical, statistically-based research in historical and economic context. Therefore, part of the introduction to this report will offer an overview of some of the policy issues surrounding education and workforce data in America. In 2013 R&P published *The Cornerstone: Building an American Public Policy for Educational Attainment and Success in the Labor Market*, a white paper on education and workforce policy from which this introduction draws much of its historical context.

Chapter 2 of this report establishes the labor market context for the tabular data in the report, along with an overview of the labor market participation, earnings, and high school completion rates for the Wyoming public school cohorts described in the report (see Defining Cohort). Chapter 3 is an application of the data to a particular sub-population of Wyoming public school students, those with Individualized Education Programs (IEPs) and those with 504 Vocational Rehabilitation accommodation plans. The final chapter is a detailed look at the methodology and datasets used to produce this report, and links to the tabular data available on R&P's website at http://doe.state.wy.us/LMI/education_we_connect/WDQI_Pub1_Appendix_B.pdf.

Defining Cohort

Cohort refers to the population segment enrolled at any time and who would normally be expected to graduate in the reference year whether they graduated or not. This definition is consonant with the meaning given to the social concept of the *Class of 20xx* and is conceptually consistent with the idea of labor supply.

Example: Students expected to graduate in 2010 may be referred to in this report as:

- 2009/10 Cohort
- Class of 2010

In the United States, the belief that education is the key to success in the labor market is "an article of faith" (Covaleskie, 2010, p.1). Although this belief is often echoed by policymakers, the requirements for success in the workforce shift based on changing industrial needs, technological advancements, war, changes in natural resources and social attitudes toward

education (Ochsner & Solomon, 1979). In addition, requirements for success in the workforce vary by industry and occupation. Given the rapidly changing job market and global economy, it comes as no surprise America's education policy has become increasingly concerned with workforce development over the last 30 years. Preparing students for gainful employment in a competitive marketplace is not just one of many desired outcomes; it is a central charge for American schools (Holmes, 2013).

Wyoming has sought to address many of its own questions regarding education and workforce development via the formation of legislative committees on education and education accountability. For example, one of the priorities of the 2015 Wyoming Joint Education Interim Committee is to "concentrate its study on workforce development and preparation" (Legisweb, 2015). The fact that the Interim Education Committee is tasked with workforce development is a testament to the systems' interconnectedness at the state and national level.

Of course, Wyoming and the nation have been concerned about the intersection of education and the workforce for some time. The 1983 report of President Ronald Reagan's National Commission on Excellence in Education (NCEE), *A Nation at Risk: The Imperative for Educational Reform ("Nation")*, successfully rooted the language of workforce development into the national discussion on education. *Nation* did more than introduce the lexicon of workforce development into education policy; it sought, in part, to answer the question, "What is school for?" David Pierpont Gardner and the NCEE argue in *Nation* that one goal of education reform should be the creation of a "Learning Society," grounded in "the idea that education is important not only because of what it contributes to one's career goals but also because of the value it adds to the general quality of one's life" (1983, p. 22).

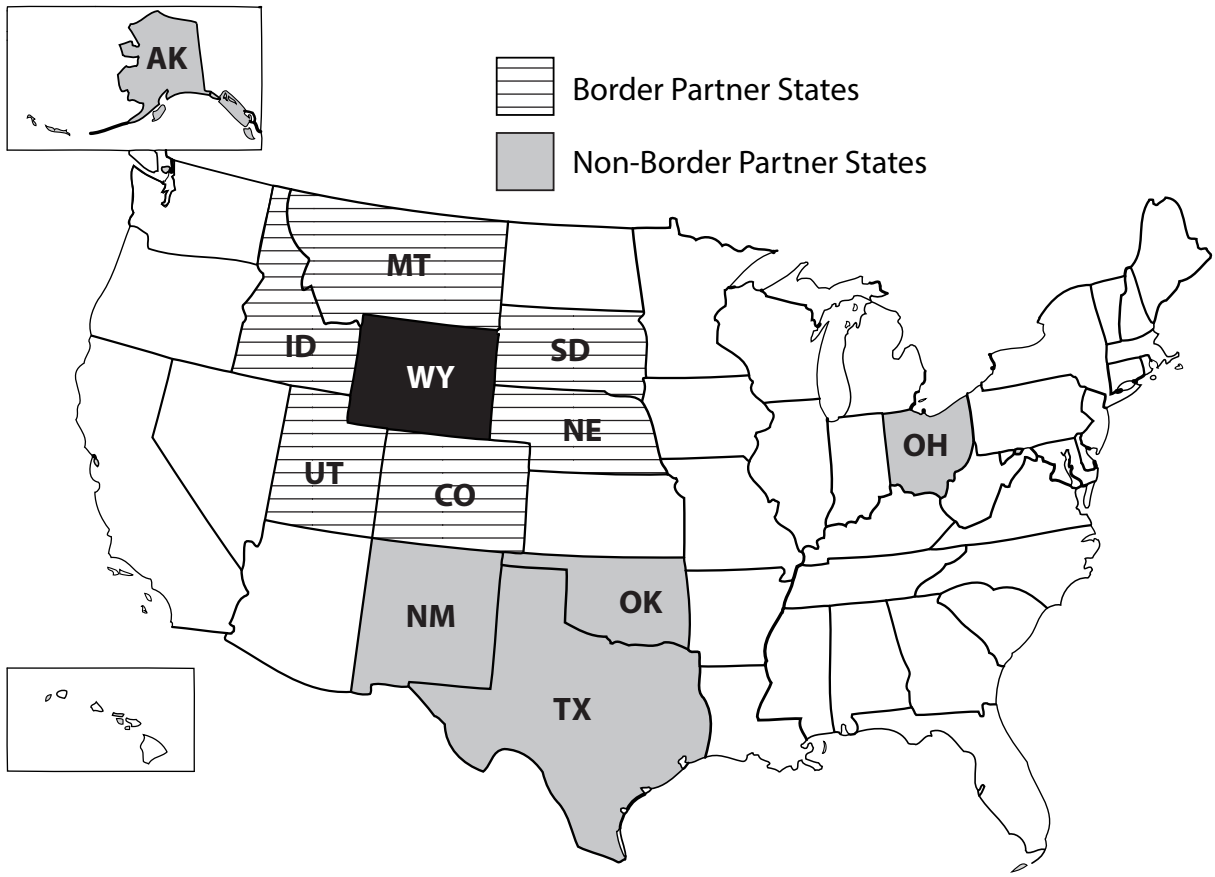
The value that education adds to one's life, while given theoretical mention in *Nation*, is not the cornerstone for the reform suggested in the report. *Nation* is concerned with human capital, competition, and education as a mechanism for attaining "the mature and informed judgment needed to secure gainful employment" (p. 16). The reason for the NCEE's concern was the rise of global competition, and America's uncertain future as an economic superpower. The report states: "the time is long past when America's destiny was assured simply by an abundance of natural resources … we live among determined, well-educated, and strongly motivated competitors" (p. 14). The central "risk" in *Nation* is not, as the report states, that America may drown in a "rising tide of mediocrity," but that the rest of the world has learned how to swim (p.1).

The findings of *Nation* – namely that the academic performance of students in American high schools was dismal – framed the dialog that our public schools were failing to produce competitive workers, and that this failure would undermine America's position of economic dominance. One problem with tasking schools with workforce development lies in the fact that students graduating from high school or college simply do not face the same job market from generation to generation. From World War II to 1965, there was a steady demand for college-educated workers in the United States (Ochsner & Solomon, 1979). By the late 1960s, some professions, such as elementary school teachers, had already balanced supply with demand. Even so, the number of college graduates increased steadily. From 1950 to 1970, the number of college-educated workers quadrupled, from 7 million to 28

million (Jaffe & Froomkin, 1978). Today, many of those graduating from college find themselves unemployed or under-employed (Vedder, Denhart, & Robe, 2013). Educational attainment alone, it seems, is not enough to ensure labor market success in America (Holmes, 2013).

In 2011, nearly 30 years after *Nation*, Congress reauthorized legislation to ensure students graduating from high schools and colleges in the U.S. are prepared to secure a place in the workforce. The America Competes Act (2007) focuses on the perceived skills gaps between the educational system and the labor market, calling for an alignment of educational "requirements, standards, and assessments with the knowledge and skills necessary for success … in the 21st century workforce" (Sec 6401). In 2012, several states introduced legislation seeking to fuse workforce development and higher education, including Alaska, Colorado, Iowa, Oregon, South Dakota, Utah, and Washington (Higher Education Legislation, 2012).

The evolving relationship between public policy, educational attainment, and the labor market – including the current interest in tasking high schools and postsecondary institutions with workforce development – is an important component of this report. School-to-work initiatives, such as the 1994 School-to-Work Opportunities Act (SWOA), have informed education accountability policies for the last two decades by calling for "performance-based education and training



Partner states are those states with Labor Market Information (LMI) offices with which Research & Planning (R&P) has data-sharing agreements.

Map: Labor Market Information (LMI) Offices in States with Which Wyoming Has Data-Sharing Agreements

programs that would prepare students for first jobs in high-skill, high-wage careers" (SWOA, 1994). Further, SWOA called for "comprehensive education reform," which would motivate "all youths … to stay or return to school." The answer to the question of which workforce development activities will continue to be placed on America's education system, while perhaps beyond the scope of this report, is a question raised each time workforce development and education policies intersect; the answers, in their disparate and complementary ways, form the cornerstone on which the future of our education and workforce development systems rest (Holmes, 2013).

The U.S. Department of Labor Workforce Data Quality Initiative Grant (WDQI) was awarded to R&P in 2013 and facilitates this report. The WDQI work is detailed further in Chapters 2 and 3, and is a natural extension of the ongoing research efforts regarding education and workforce data in this country. WDQI grants seek to improve the quality of workforce data, and allow states to develop workforce data systems that can eventually be linked to education data. In Chapter 3 we examine a specific application of the WDQI work, and describe the workforce interactions of students with Individualized Education Programs and 504 Vocational Rehabilitation designations. The ability to describe labor market interactions for a particular sub-set of students who cross into the domains of education, vocational rehabilitation, and the workforce represents a practical application of the WDQI tool which has not been possible until now.

R&P has the tools, through the WDQI grant, to address longstanding questions around school-to-work initiatives. The intent of this report is to elicit dialog around this new approach and aid in addressing education and workforce questions. R&P has a long history of research on educational outcomes, beginning with our 1995 study on University of Wyoming graduates, *Tracking University Graduates into the Work-force*. An annotated bibliography of some of R&P's research on the subject comprises some of the credentials which helped qualify R&P for the WDQI award (see page 9). The annotated bibliography follows this introduction.

The Workforce Data Quality Initiative (WDQI) work allows Research & Planning (R&P) to facilitate the evaluations of state-run programs as per H.R. 803:

H.R. 803: Workforce Innovation and Opportunity Act

Sec. 116 Performance Accountability System

(e) Evaluation of State Programs

(1) IN GENERAL.—Using funds authorized under a core program and made available to carry out this section, the State, in coordination with local boards in the State and the State agencies responsible for the administration of the core programs … The State shall coordinate the evaluations with the evaluations provided for by the Secretary of Labor and the Secretary of Education under section 169, section 242(c)(2)(D), and sections 12(a)(5), 14, and 107 of the Rehabilitation Act of 1973 (29 U.S.C. 709(a)(5), 711, 727) (applied with respect to programs carried out under title I of that Act (29 U.S.C. 720 et seq.)) and the investigations provided for by the Secretary of Labor under section 10(b) of the Wagner-Peyser Act (29 U.S.C. 49i(b)).

Chronology of Selected R&P Publications for Linked Administrative Records

Compiled by: Lynae Hammer, Office Support Specialist
Research & Planning, Wyoming Department of Workforce Services
These reports are available online at http://doe.state.wy.us/LMI.

Tracking University of Wyoming Graduates Into the Wyoming Work-force, September 1995

Under the Lamppost: Report to Workforce Development Council on Wyoming Institutions of Higher Education Program Completers, November 1998

Workforce development and community college outcomes (Skip Gillum et. al); When does training pay off? (Tom Gallagher), *Wyoming Labor Force Trends*, July 2001

The Effects of a College Degree on Wages: The Different Experiences of Men and Women, October 2001

Where Are They Now? Wyoming Community College Graduates' Labor Market Outcomes 2004, August 2004

Cooking Up a Career: Examining the Outcomes of a High School Training Program in the Culinary Arts and Hospitality Management, August 2005

Wyoming Community College Graduates' Labor Market Outcomes 2005: An Administrative Records Approach, April 2006

Retention of Nurses in Wyoming: Part II, August 2008

Job attainment and wages of Wyoming vocational rehabilitation participants, Patrick Manning, *Wyoming Labor Force Trends*, February 2010

Driven by demographics: Examining employee exits in state government, Tony Glover and Michael Moore, *Wyoming Labor Force Trends*, December 2010

Health Care Workforce Needs in Wyoming: Advancing the Study, Fall 2011

Monitoring School District Human Resource Cost Pressures, Fall 2013

Effects of decline in teen drivers, Michael Moore, *Wyoming Labor Force Trends*, September 2014

Nurses Returning to School: Motivation and Job Satisfaction as a Buffer between Perceived Employer Discouragement and Time Constraints, Patrick Harris, Fall 2014

Chapter 2: Student Interaction with the Labor Market

by: Tom Gallagher, Research & Planning Manager

Federal investment in employment and training programs is increasingly tied to demonstrating a return on investment for individuals, employers, and communities. To a considerable extent, demonstrating the efficacy of programs depends on the use of administrative data. Administrative data are necessarily generated in the course of program development and implementation. In addition to program relevance, the cost of administrative records (records created in the course of administering a program) is already borne by training and educational programs themselves making their use for statistical purposes both substantively grounded and comparatively inexpensive (Burwell, 2014).

This paper presents initial results from a U.S. Department of Labor Workforce Data Quality Initiative (WDQI) grant awarded to the Department of Workforce Services, Research & Planning (R&P) in the summer of 2013. A central objective of the award is to conduct administrative records research to "Provide user-friendly information to consumers to help them select the education and training programs that best suit their needs." (SGA, see http://www.grants.gov/web/grants/search-grants.html?keywords=SGA-DFA-PY-12-07;) Consumer choice, viewed in its broadest sense related to workplace outcomes, encompasses programs leading to the re-employment of Unemployment Insurance claimants, Adult Education, Career and Technical Education, Vocational Rehabilitation, other training efforts, and the system of formal education in general.

Successful WDQI grant applications depend upon written support from State Departments of Education and institutions of higher education expressing a willingness to enter into data sharing agreements allowing the linkage between educational and training student records and records of workforce participation held by State Departments of Workforce Services.

Given the focal point of the Wyoming Department of Education (WDE) on student data collection and accountability in the state, R&P's initial research effort into student outcomes focuses on linking high school student exposure to employment opportunities via WDE student records (WDE 684 report files), and student records matched to National Student Clearinghouse (NSC) files. The research describes how young adults in Wyoming navigate their first work experiences and post high school educational efforts. See the Memorandum of Understanding between the Wyoming Departments of Education and Workforce Services under which this work is conducted at http://doe.state.wy.us/LMI/education_we_connect.htm.

The Role of Economic Opportunity

An objective of the WDQI research is to understand how economic opportunity affects young adults' access to jobs and how that access affects subsequent choice in the labor market. As a research entity, R&P focuses on the labor market and recognizes the role of human capital in workplace outcomes. A measure of the aggregate level of the demand for labor in

Wyoming, from 2004 through early 2014, is depicted in Figure 2.1. The period of rapid economic expansion, contraction, and subsequent period of moderate employment and payroll earnings growth is discussed in several reports from R&P (see page 23).

Rapid employment growth during the middle of the 2000-2010 decade was accompanied by high labor force participation rates in Wyoming, low unemployment rates, sustained in-migration of non-resident workers, and by the vast majority of high school seniors finding at least some work during their final year in high school.

Unless otherwise specified, this chapter focuses on the cohort of youth expected to complete the 12th grade in a specific year. *Cohort* refers to the population segment enrolled at any time and who would normally be expected to graduate in the reference year whether they graduated or not. This definition is consonant with the meaning given to the social concept of the *Class of 20xx* and is conceptually consistent with the idea of labor supply.

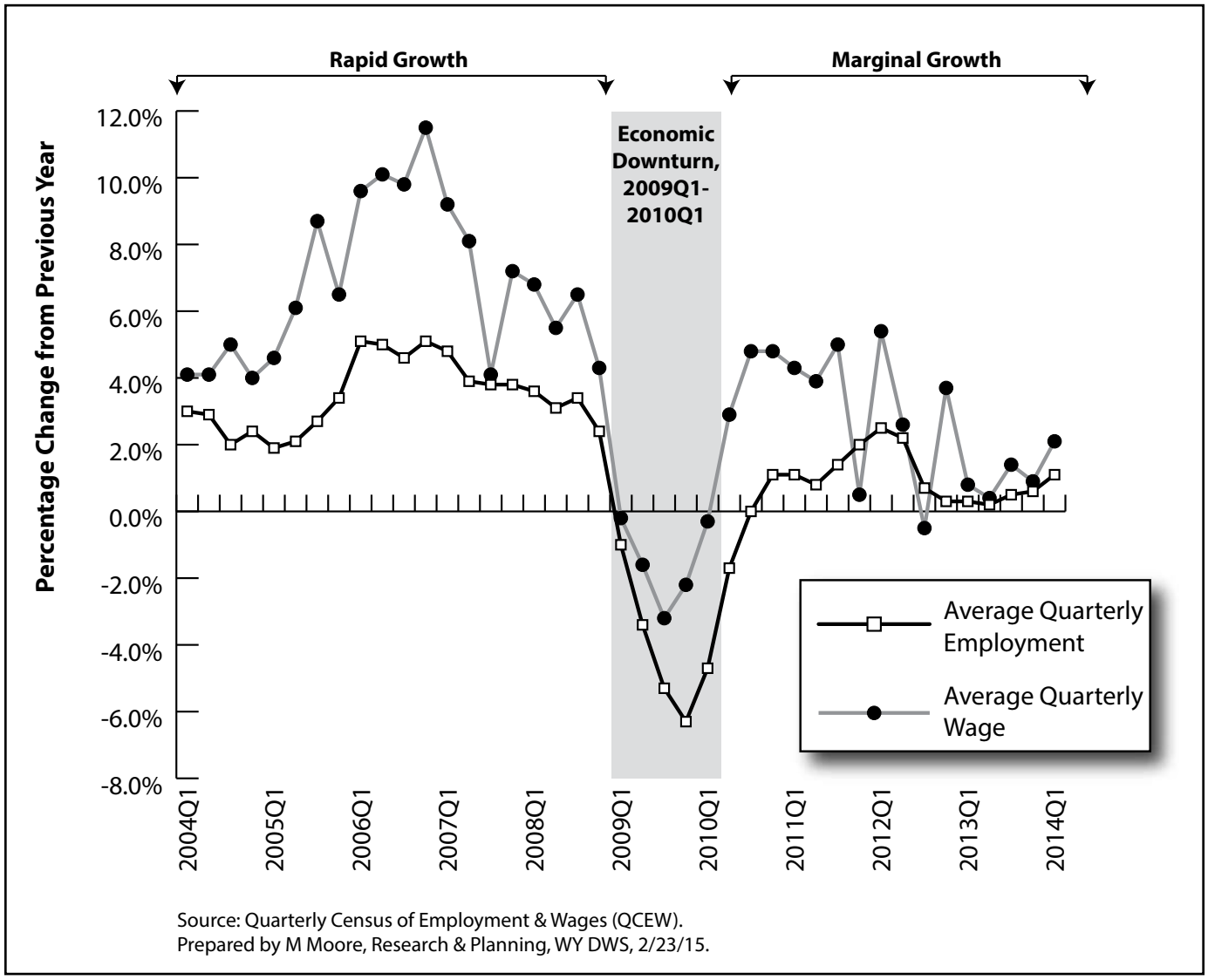


Figure 2.1: **Economic Change in Wyoming, 2004Q1-2014Q1**

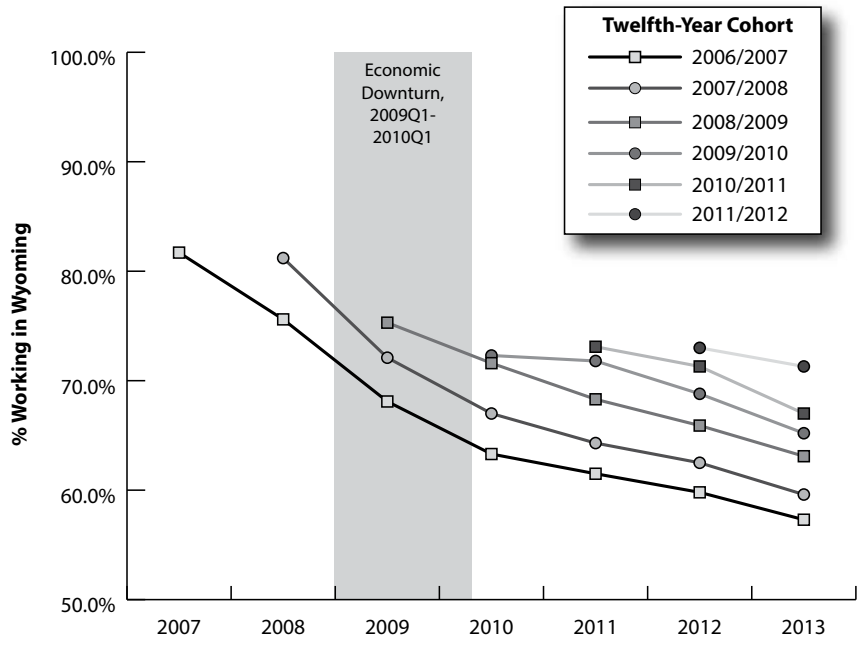
As shown in Table 2.1 and Figure 2.2, 81.7% of those enrolled in the 12th grade during the 2006/07 school year (2007 cohort) in Wyoming worked at some point during calendar year 2007 in a job covered by state Unemployment Insurance (UI)[1]. During calendar year 2008, still the period of rapid economic expansion, nearly the same proportion (81.2%) of 12th graders worked at least some period during the year.[2] However, employment in the state began a rapid period of decline beginning in the first quarter of calendar year 2009. Coincidental with the overall decline in employment, the proportion of 12th graders from the 2009 cohort holding a job during calendar year 2009 declined to 75.3% and did not rise above that level through the completion year.

Wyoming Department of Employment (WDE) began assigning a unique identifier to each student in the 2006/07 school year. The assignment of this number, and its linkage to UI wage records, permits tracking employment experiences of the 2006/07 completer employment activity through the 2013 calendar year (and into the future). As shown in Table 2.1, by 2013, or six years after their 12th grade cohort, 57.3% of the 12th graders from the 2006/07 completion year were found working in Wyoming. As

Table 2.1: Twelfth-Year Cohort Working in Wyoming By Calendar Year, 2007-2013

Cohort Year	2007	2008	2009	2010	2011	2012	2013
2006/07	81.7%	75.6%	68.1%	63.3%	61.5%	59.8%	57.3%
2007/08		81.2%	72.1%	67.0%	64.3%	62.5%	59.6%
2008/09			75.3%	71.6%	68.3%	65.9%	63.1%
2009/10				72.3%	71.8%	68.8%	65.2%
2010/11					73.1%	71.3%	67.0%
2011/12						73.0%	71.3%
2012/13							72.2%
Total Working	**4,572**	**8,719**	**11,854**	**15,707**	**19,762**	**23,609**	**27,245**

Source: Custom Extracts from Workforce Data Quality Initiative (WDQI) Project. Prepared by L Hammer, Research & Planning, WY DWS, 3/27/15.



Source: Custom Extracts from Workforce Data Quality Initiative (WDQI) Project. Prepared by L Hammer, Research & Planning, WY DWS, 3/27/15.

Figure 2.2: Twelfth-Year Cohort Working in Wyoming By Calendar Year, 2007-2013

[1] UI covered jobs include more than 93% of all jobs in the state. Quarterly UI records of pay, also known as wage records, are used throughout this report to document student employment.

[2] The 2006/07 School Year is the first year WDE oversaw the assignment of unique student identifiers to each student, facilitating this analysis. See http://portals.edu.wyoming.gov/WISE/sf-docs/student-legal-names/student-legal-names-training.pdf?sfvrsn=4 for a discussion of the student identification assignment process.

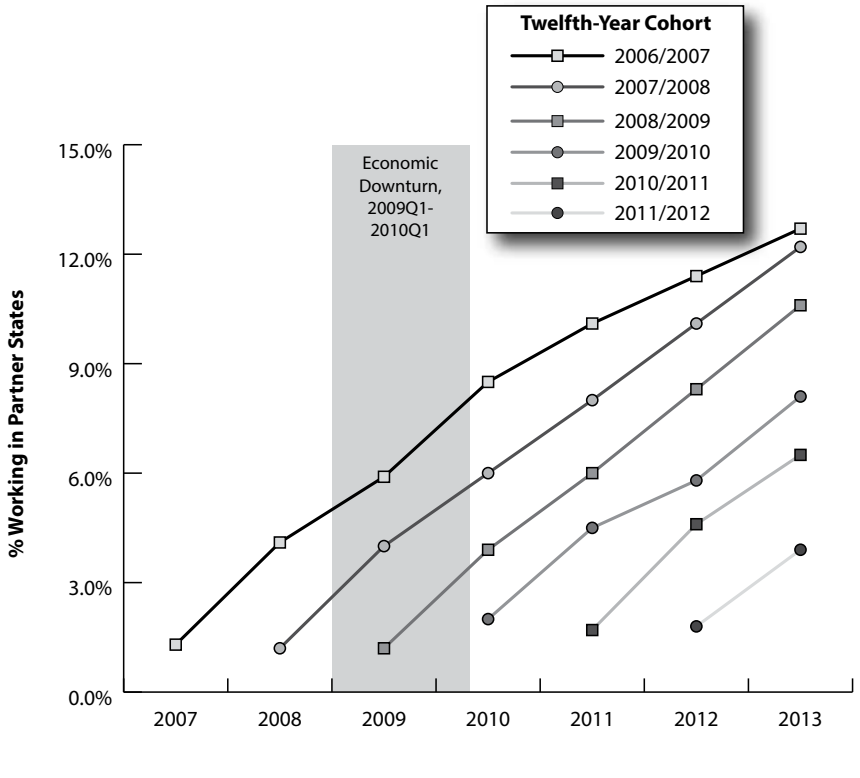
can be seen in Table 2.2 and Figure 2.3, 1.3% of the 2006/07 cohort were working in another state when they were in the 12th grade and after six years, in 2013, that proportion had risen to 12.7%. A map of states with which R&P has data sharing agreements can be found on page 7 of this report. Each state data sharing agreement can be found in Appendix C of the MOU with WDE at http://doe.state.wy.us/LMI/education_we_connect.htm.

As we shall shortly discuss in some detail, cohort members can move between Wyoming and other states for work (i.e. between Table 2.1 and Table 2.2) and between work and post high school attendance independently from a location of prior work or school attendance across time. For example, a share of the 1.3% of persons working in another state during their year as a Wyoming senior in the 2006/07 cohort (see Table 2.2) could have been part of the 57.3% of the 2006/07 cohort working in Wyoming in 2013 (see Table 2.1). With 52.6% of the 2006/07 senior cohort enrolled in a post high school institution of higher education in calendar year 2007 (see Table 2.3 and Figure 2.4, page 14), and 81.7% working in the same calendar year (see Table 2.1), it is evident that a large share of the 2006/07 cohort both worked and attended a post high school institution of higher education in the same year. Longitudinal tracking of student outcomes in the market and among institutions of higher education represents a complex dynamic of constant population movement which tabulations can only freeze in frame

Table 2.2: Twelfth-Year Cohort Working in Partner States By Calendar Year, 2007-2013

Cohort	2007	2008	2009	2010	2011	2012	2013
2006/07	1.3%	4.1%	5.9%	8.5%	10.1%	11.4%	12.7%
2007/08		1.2%	4.0%	6.0%	8.0%	10.1%	12.2%
2008/09			1.2%	3.9%	6.0%	8.3%	10.6%
2009/10				2.0%	4.5%	5.8%	8.1%
2010/11					1.7%	4.6%	6.5%
2011/12						1.8%	3.9%
2012/13							1.8%
Total N	**73**	**301**	**614**	**1,147**	**1,718**	**2,404**	**3,232**

Source: Custom Extracts from Workforce Data Quality Initiative (WDQI) Project. Prepared by L Hammer, Research & Planning, WY DWS, 3/27/15.



Source: Custom Extracts from Workforce Data Quality Initiative (WDQI) Project. Prepared by L Hammer, Research & Planning, WY DWS, 3/27/15.

Figure 2.3: Twelfth-Year Cohort Working in Partner States By Calendar Year, 2007-2013

for analytical purposes. Individuals can leave high school in Wyoming, attain a credential in another state, and return to Wyoming to attend higher education and work at the same time.

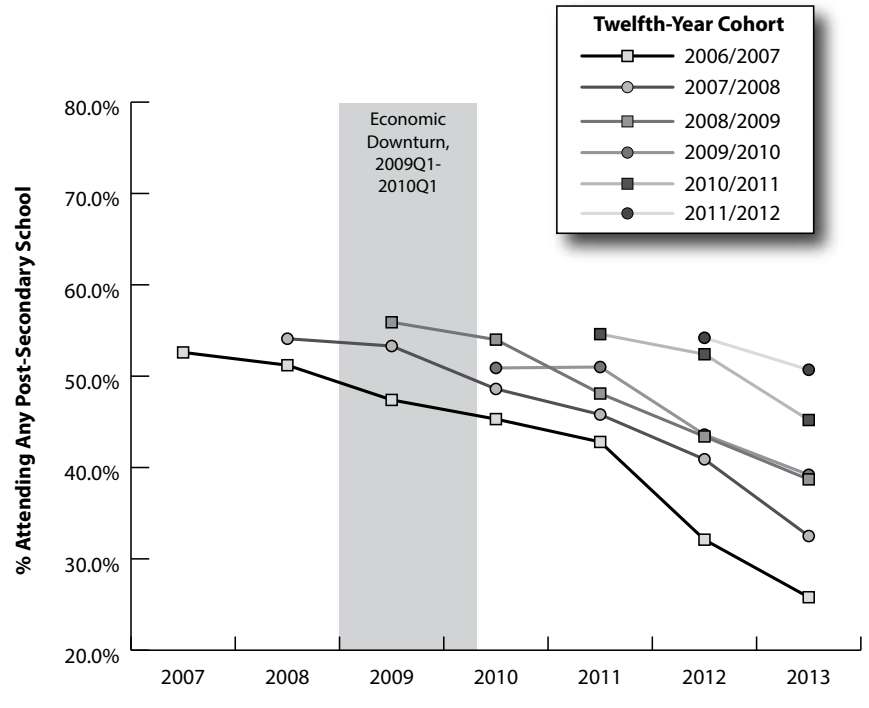
Table 2.3 and Figure 2.4 track the proportion of each cohort from 2006/07 to 2012/13 found attending a post high school institution of higher education across the nation. In 2013, 25.8% of the 2006/07 cohort were found enrolled in a post-secondary institution. Since each cell in the table is calculated independently of the others, this 25.8% could be a completely different set of individuals from the same 2006/07 cohort, than the 52.6% enrolled in post-secondary education in 2007.

Among all cohorts, enrollment in post-secondary education in the same year that individuals attained 12th grade was highest for the 2008/09 cohort (55.9% in 2009) and lowest for the 2012/13 cohort (50.4% in 2013). In other words, a little less than half of 12th graders from each cohort did not attend a post-secondary institution in the year that most of them would have graduated from high school for the seven years for which data are available. Future analysis will provide us with an improved understanding of the proportion of high school students who never attend post-secondary institutions in contrast to those who defer participation. High school, and shortly thereafter, is a period when many alternative social and economic paths are offered simultaneously. In sum, the distinction between school and work, and which is most important within a particular time frame, is not always clear from the available data.

Table 2.3: Twelfth-Year Cohort Attending Any Post-Secondary School By Calendar Year, 2007-2013

Cohort	2007	2008	2009	2010	2011	2012	2013
2006/07	52.6%	51.2%	47.4%	45.3%	42.8%	32.1%	25.8%
2007/08		54.1%	53.3%	48.6%	45.8%	40.9%	32.5%
2008/09			55.9%	54.0%	48.1%	43.4%	38.7%
2009/10				50.9%	51.0%	43.6%	39.2%
2010/11					54.6%	52.4%	45.2%
2011/12						54.2%	50.7%
2012/13							50.4%
Total N	**2,942**	**5,855**	**8,612**	**11,374**	**14,137**	**15,734**	**16,993**

Source: Custom Extracts from Workforce Data Quality Initiative (WDQI) Project. Prepared by L Hammer, Research & Planning, WY DWS, 3/27/15.



Source: Custom Extracts from Workforce Data Quality Initiative (WDQI) Project. Prepared by L Hammer, Research & Planning, WY DWS, 3/27/15.

Figure 2.4: Twelfth-Year Cohort Attending Any Post-Secondary School By Calendar Year, 2007-2013

Income Inequality: Understanding Earnings

Table 2.4: **Wyoming High School 2009/10 Cohort (N = 5,481) Tracked into Post-Secondary Education and the Workforce within Wyoming, 2010-2013**

	2010	2011	2012	2013
2009/10 Graduates Working in Wyoming (5,481 = 100.0%)				
Working N	4,189	4,275	4,186	4,123
Working %	76.4%	78.0%	76.4%	75.2%
Median Annual Earnings	$4,689	$7,265	$9,693	$11,992
2009/10 Graduates Enrolled in Post-Secondary* (5,481 = 100.0%)				
Enrolled N	3,218	3,227	2,768	2,487
Enrolled %	58.7%	58.9%	50.5%	45.4%
Working N	2,489	2,635	2,199	1,921
Working %	45.4%	48.1%	40.1%	35.0%
Median Annual Earnings	$4,083	$5,911	$7,275	$8,082
2009/10 Graduates Not Enrolled in Post-Secondary and Working (5,481 = 100.0%)				
Working N	1,700	1,640	1,987	2,202
Working %	31.0%	29.9%	36.3%	40.2%
Median Annual Earnings	$6,043	$10,776	$14,260	$16,921

*Wyoming Department of Education records match to National Student Clearinghouse files.

Source: Custom Extracts from Workforce Data Quality Initiative Project. Prepared by T Glover and L Hammer, Research & Planning, WY DWS, 2/2/15.

The 2009/10 school year is the first year that WDE student level records include an indication of graduation in the WDE 684 reporting system. The availability of individual student records permits analysis of the interplay between school and work by linking student records to employer UI payroll tax records and to enrollment in institutions of higher education from the National Student Clearinghouse (see Box, page 17) as students leave high school and establish their place in the workforce.

Previous work on Wyoming Community College student labor market outcomes demonstrates that many individuals work while attending institutions of higher education, and that school attendance is associated with lower earnings in comparison to individuals from the same cohort who do not attend school. The data in Table 2.4 indicates that earnings differences between people who work while attending school, and those who work without attending school beyond high school, begins within the year of graduation.

As shown in Table 2.4, 76.4% of the 2010 Wyoming high school graduates worked for at least some earnings in 2010 (as determined from UI wage records matches across 12 states). Of 5,481 graduates, 45.4 percent worked and attended an institution of higher education (based on matches to all institutions in the National Student Clearinghouse files), and an additional 31.0% worked but did not attend school. Workers not attending school earned $6,043 on average, or 48% more than those attending school who earned $4,083 on average. By 2013, the difference in earnings was more than double, with out-of-school high school graduates earning $16,921 compared to $8,082 in average earnings for those attending school. Clearly, the decision to attend school is associated with lower earnings for those who also work in comparison to individuals declining to attend a public institution of higher education and work instead (see Figure 2.5, page 16). On the other hand, there may be other factors contributing to the difference in earnings between those who attend school and those who do not attend school after high school observed in Table 2.4.

For many individuals, the post-high school period involves decisions related to

migration to states with strong labor markets (see Chapter 4 for tabulations of earnings in states other than Wyoming), decisions regarding household formation, and for some, decisions about obtaining career-related training that may not be recorded in National Student Clearinghouse records. Some youth, for example, may obtain short-term career training in conjunction with Workforce Investment Act or other training opportunities. Discerning the impact on earnings of major life choices other than to attend, defer, or never participate in higher education on earnings can be accomplished through analysis that incorporates the measurement of these life events by acquiring other databases (e.g. Workforce Investment Act, UI and Workers Compensation claims, Vocational Rehabilitation, Temporary Assistance for Needy Families, etc.), the use of control groups, or some combination of these two strategies.

All of the data in Table 2.4 represent students who graduated from high school in Wyoming. Had we been able to link those graduate records only to UI wage records to examine earnings, some observers would have been tempted to reach the clearly erroneous conclusion that earnings more than doubled between the year of graduation in 2010 ($4,689), and 2012 ($9,693) as a function of high school graduation. A knowledge of, and the capacity to link to, key life choices (attending postsecondary school) and

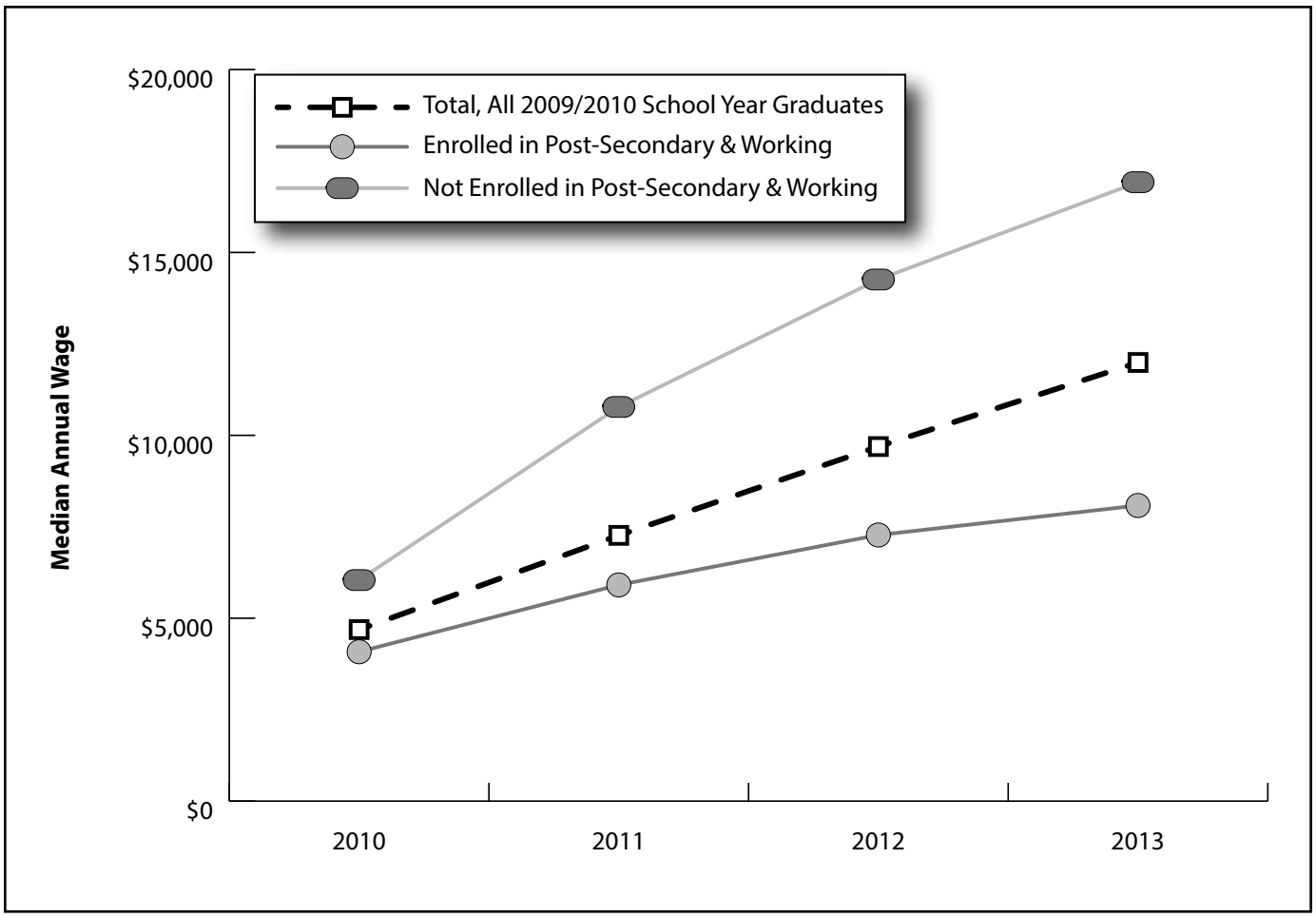


Figure 2.5: **Median Annual Earnings for Wyoming High School 2009/10 Cohort (N = 5,481) by Post-Secondary Enrollment Status, 2010-2013**

events in the environment over which one has little control (a period of job loss measured through claims activity) are essential ingredients in accounting for outcomes from training and education.

Economic and Social Mobility: Finding a Place

Young adulthood (for discussion purposes here considered as 18 to 30 year olds) is a period when decisions about school, career, job finding, migration, and often, household formation are made. In this context, the remainder of this chapter focuses on the dynamics of Wyoming's labor market associated with the retention of young adults in Wyoming.

Getting and keeping a job that pays above average earnings, for many, represents a measure of success in the labor market. Another way to present this idea is to suggest that low market volatility, or market stability and continuity, are often associated with wage progression as employers invest in workers and workers invest in their place of work. On the other hand, market volatility, or instability, is represented by high employee turnover, and difficulty attaining steady work based relationships between worker and employer(s).

For purposes of this analysis we use UI wage records, and their persistent linkage to employer payrolls

About the National Student Clearinghouse

"The National Student Clearinghouse (NSC) was founded in 1993 with roots in the student loan industry. To this day, one of its primary services is to report on students receiving financial aid at American postsecondary institutions to both the education finance industry and the U.S. Department of Education. …

"Employers and high schools also use NSC's services to verify students' degrees and to track the postsecondary success of students after high school graduation. Academic researchers and policy analysts have also started using NSC data for a variety of purposes. …

"When researchers or policymakers obtain data from the NSC, they generally use the service called "StudentTracker." This service uses a proprietary algorithm to match a list of students supplied by the researcher to the NSC's detailed enrollment and degree information. This algorithm matches primarily on student name and date of birth. For those students who are found in NSC's database, a wealth of information is returned. Colleges submit enrollment data to the NSC several times each academic year, reporting the beginning and ending date that students are enrolled during each term, and at what intensity they are enrolled (i.e., part-time or full-time)."

Source: Dynarski, S., Hemelt, S., and Hyman, J. (2013). *The Missing Manual: Using National Student Clearinghouse Data to Track Postsecondary Outcomes.* pp. 2-3. Retrieved April 3, 2015, from http://nationalstudentclearinghouse.org

(measured in terms of compensation) over time to construct an index of market stability (Glover & Peters, 2000) or a calendar year, an employee has been hired, left an employer, (or is a short-term employee, both hired and leaving), or is continuously employed (working in the current period, the prior period, and the subsequent period). The two conditions of high and low volatility are represented in Figure 2.6, with high volatility found in the very seasonal construction industry and relatively low volatility found in the health care industry. For discussion purposes, we can suggest that many of the jobs in the construction industry require neither extensive formal education nor a long–term commitment in comparison to jobs in health care. Turnover in the construction industry suggests that jobs often open on a regular seasonal basis, but that they are not likely to require a long-term commitment.

Figure 2.7 summarizes the Instability Index in Wyoming in terms of its three basic components of interaction between worker and employer while Figure 2.8 (see page 19) illustrates the relationship between instability and the age of workers over a 20 year period (from 1993 to 2013). Figure 2.8 reveals that an instability index above 50% characterizes teen years of involvement with Wyoming's market with instability declining to the 30% to 40% range as the population of workers increases to age 30. However, Figure 2.8 displays a cross-section of age at 20 different single points in time which conceals the interacting effects of population in- and out-migration of the workforce.

Figure 2.9 (see page 19), on the other hand, demonstrates the loss of persons from employment in Wyoming (wage records basis) by illustrating the tracking of cohorts of 18-year-olds for each year from 1992 to 2010, over 10-year periods. A

Industry A: Health Care	Industry B: Construction
A) Continuous Employment = 29,183	A) Continuous Employment = 16,488
B) Hires = 2,912	B) Hires = 3,805
C) Exits = 2,917	C) Exits = 3,739
D) Both Hires and Exits = 699	D) Both Hires and Exits = 2,033
E) B + C + D= 6,528	E) B + C + D= 9,577
F) A + B + C + D = 35,711	F) A + B + C + D = 26,065
Industry A Turnover:	**Industry B Turnover:**
(E) 6,528/(F) 35,711 = 18.3%	(E) 9,577/(F) 26,065 = 36.7%

Source: Wage Records database.

Prepared by L Hammer, Research & Planning, WY DWS, 3/26/15.

Figure 2.6: **Industry Employment Turnover Rate**

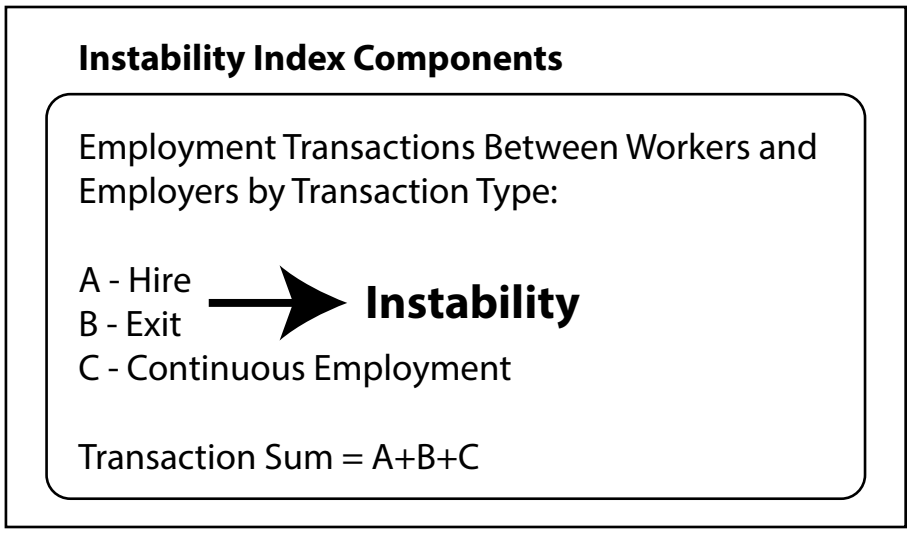


Figure 2.7: **Instability Index**

high degree of market instability (see Figure 2.8) appears to precede loss from employment in Wyoming and is associated with withdrawal from employment in Wyoming. Whether market instability can be said to precipitate withdrawal from the market is the subject of further analysis. While the linkages are not empirically demonstrated, a path for analysis which links the aggregate demand for labor (see Figure 2.1) to the absence of market stability (see Figure 2.7) and the loss of market participation by Wyoming's youth (18-year-olds) holds out a promising outline for future analysis.

For those who remain in Wyoming after young adulthood, earnings rise as instability decreases. Earnings by age and gender, based on wage records, can be found in Figure 2.10 (see page 20). Earnings by age and gender for all counties in Wyoming from 1992 to 2013 can be found at http://doe.state.wy.us/LMI/earnings_tables/2014/index.htm. As displayed in Figure 2.10, average earnings for females are just above the $30,000 per year mark and remain there through the mid-50 year old age group. Earnings have a similar trajectory for males and average between $50,000 and $60,000 per year corresponding to a period of relative market stability (see Figure 2.8). It is not clear what proportion of young adults make the

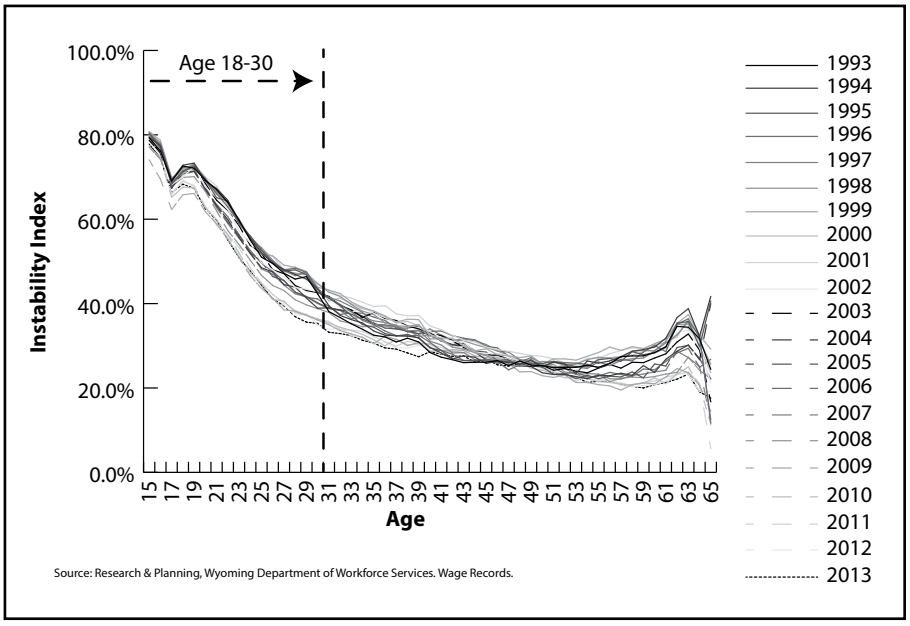


Figure 2.8: Instability Index by Year and Age in Wyoming, 1993 to 2013

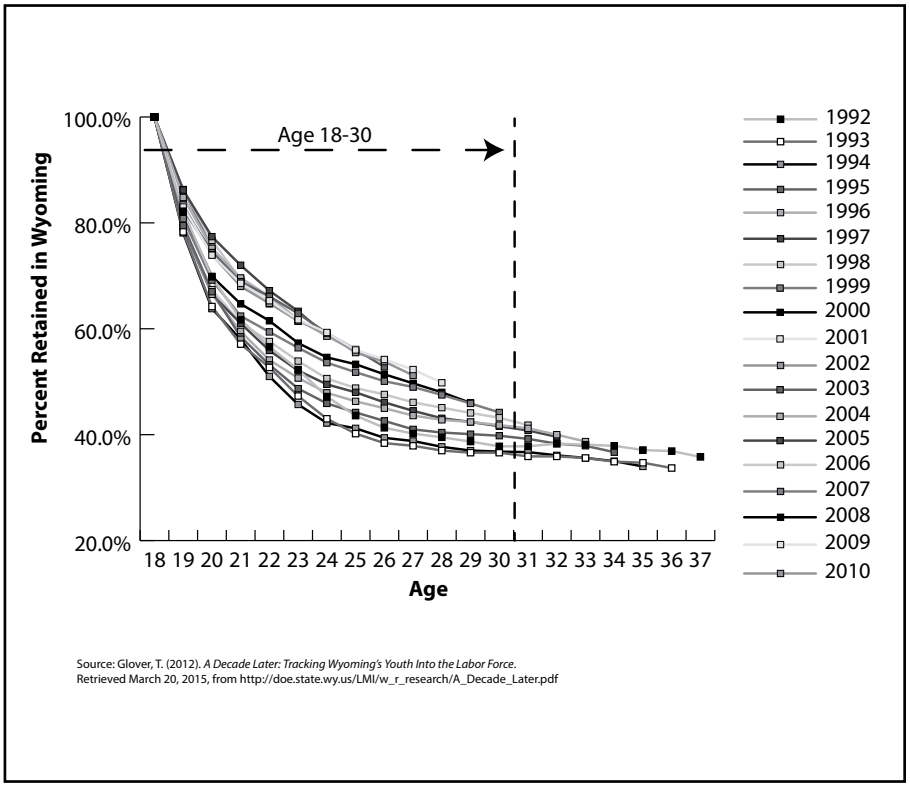
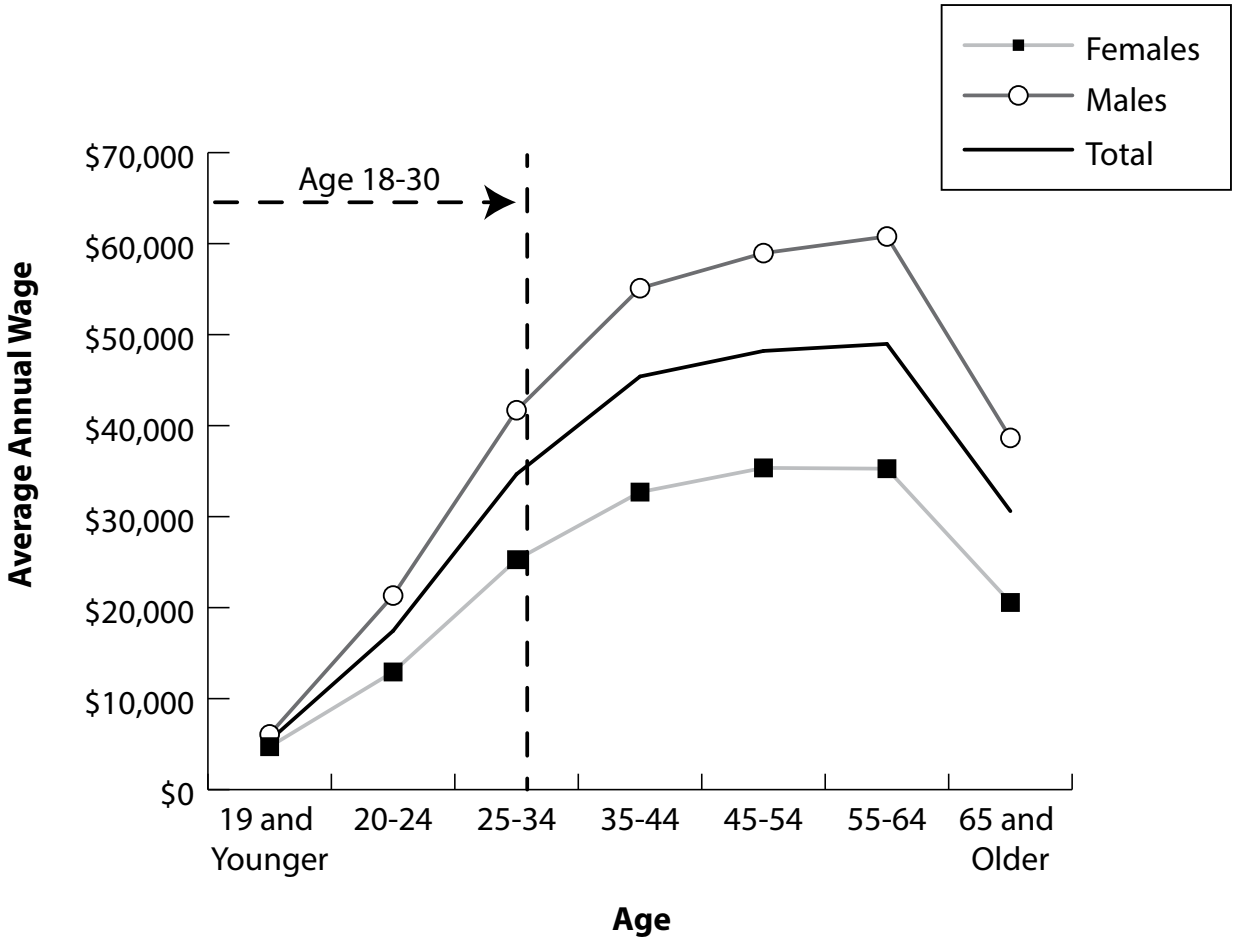


Figure 2.9: Percentage of All Cohorts of 18-Year-Old Workers Retained in Wyoming, 1992 to 2010

transition from high school graduation, market instability, and higher earnings in middle age as a function of either persistence in the market, engagement with the system of higher education, or both.

The analysis presented here is based on administrative records available to Labor Market Information research offices in only a few states. We may soon see corroborating descriptive analysis of the interaction between young adults and post high-school interaction with higher education and the workplace in other states. For at least some periods in the lives of most young adults in Wyoming, both work and school are part of a shared experience in which neither can be well understood without the other. However, it is unclear to what other environments or how far into the future these results can be generalized. Basing information on one state limits our capacity to identify which conditions necessarily result in certain outcomes with a high degree of confidence. Comparative analysis is essential to determine how changing or comparable conditions influence outcomes.

Other sources of information drawn from nationwide household surveys can

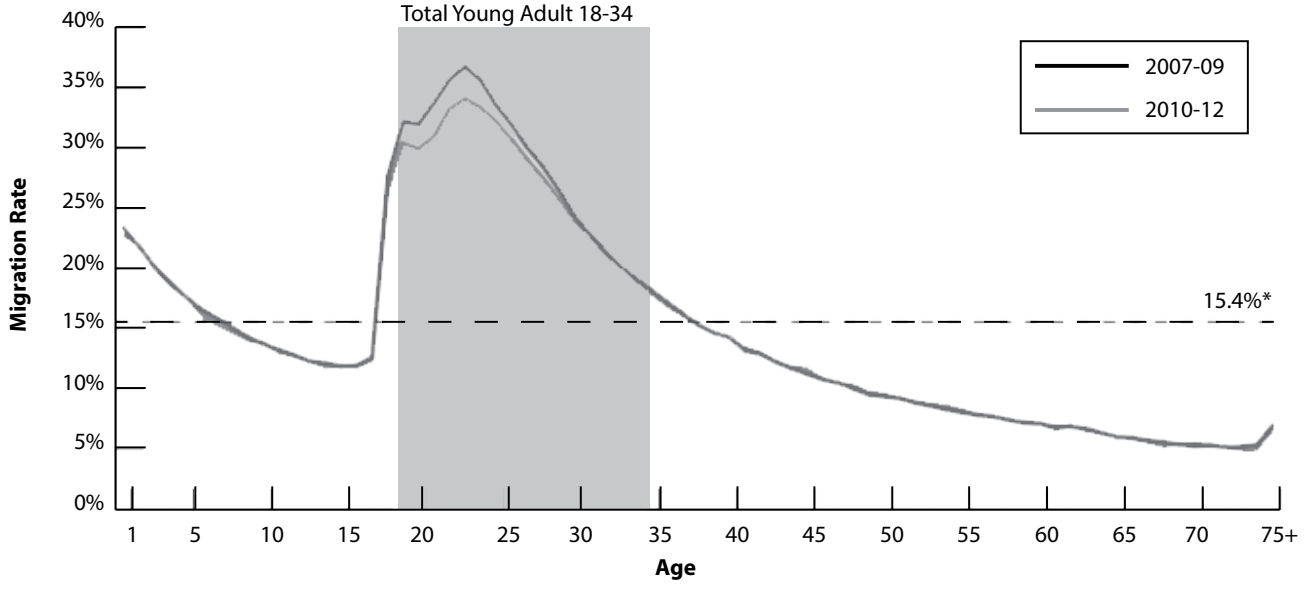


Source: Research & Planning, Wyoming Department of Workforce Services.
Earnings in Wyoming by County, Industry, Age and Gender, 2000-2014.

Figure 2.10: **Average Earnings by Age and Gender in Wyoming, 2014**

help put the present research into context until other state LMI offices more fully develop their research capabilities based on comparable administrative records data sets. While this report discusses migration exclusively in terms of inter-state re-location, the Census Bureau produces a report relevant to the current discussion that uses a "change of address" to define migration. (Benetsky, Burd, and Rapino, 2015, p.1) Figure 2.11 displays nationwide migration rates by age for two recent periods. In both periods, migration rates are the highest for those in their late teens through their early 30s. The high migration rates for the young adult population displayed in Figure 2.11 complement the results for market withdrawal in Wyoming depicted in Figure 2.9. This similarity suggests that there is some common ground relating to migration that is a function of age rather than exclusively a state specific phenomenon. The Census reports, for example, that "Educational attainment had a clear association with the likelihood to migrate. Among all young adults, those who had some college or graduated from college were the most likely to move …" (p. 10). Given the available student records for Wyoming, and future data files received from from higher education, post-graduation migration measurement is attainable and can be compared to survey data to evaluate the reasonableness of our findings and determine whether or not the migration of secondary graduates occurs at a different rate than in the nation as a whole. However, truly identifying differences and similarities depends on other WDQI grantee research reporting of comparable analysis.

The Census Bureau survey data reported in Figure 2.11 is one of the many products derived from the America's Community Survey (ACS). This source of information is expensive and it rarely



* The average migration rate for the total population, 2007-09 to 2010-12.
Note: This figure does not include movers in Puerto Rico.
Source: U.S. Census Bureau, 2007-09 and 2010-12 American Community Survey 3-Year Estimates.
Retrieved April 3, 2015, from http://www.census.gov/content/dam/Census/library/publications/2015/acs/acs-31.pdf

Figure 2.11: Age-Specific Migration Rates for the U.S., 2007-09 and 2010-12

serves the test of state and local relevance because of small sample size. The Census Bureau's Fiscal Year 2016 budget request for the ACS is $241.6 million (U.S. Census Bureau, 2015). The second short-coming of survey data is that subjects and interventions (e.g. educational attainment) cannot be tracked longitudinally or as people move from state to state as effectively or cost effectively as we have done in this report. ACS data come from a sample survey which means results are subject to sampling error (and at the local level sampling error tends to be relatively large) and non-sampling error (i.e. they represent persons survey reports about behavior rather than representing an official record of behavior). Without longitudinal tracking using administrative records, understanding the impact of human resource investments is very difficult if not impossible to accomplish.

Conclusions and Future Research

The primary approach to analysis in this chapter has been descriptive and exploratory. There are, at this time, very few examples of comparable research in Wyoming or the nation to lay the groundwork for entering into the predictive and explanatory phase of research on student behavior and market outcomes. We have, instead, begun to lay out a path to the next phase in the research process.

Student specific records linked to employment and earnings outcomes data are essential to understanding the impact of interventions designed to assist students in attaining their goals in the market place. As will be discussed in the next chapter, the availability for researchers of employment information linked to student records is essential to the production of program intervention impact evaluation. With appropriate research designs, interventions having a desired end can be detected and their potential explored for application to larger populations of students.

The discussion and accompanying Figures in this chapter represent a framework for future analysis of the paths typically followed from young adulthood through middle age, maturity, and the connection to work and education and training. Given the volatility of Wyoming's labor market, there are many opportunities necessitating a consideration of additional training, re-training, and adding more education to adapt to changes in the demand for labor. The rapid decline in the demand for labor in Wyoming depicted in Figure 2.1 is just one of several dramatic downturns in the demand for labor that are part of its recorded history.

Our analysis began with the proposition that the aggregate demand for labor can affect the proportion of students finding work. An implication of this assertion is that educational quality may remain relatively constant or change slowly over time while job opportunity varies substantially. In effect, educational attainment may not be the most relevant factor in market outcomes. However, much work remains to be done to determine the role of the market on student outcomes over the time span of young adulthood since there are so many variables whose impact remains unexplored. Rural – urban comparative analysis within Wyoming, the impact of the proximity to urban centers in other states on migration, the effect of local employment opportunities

as youth reach maturity represent some of the factors yet to be explored. Moreover, the introduction in 2006 of a major State investment in a student higher education scholarship program, and the expansion of human resources at the school district level (see http://doe.state.wy.us/LMI/education_costs.htm) are factors whose impacts are unknown.

A domain that remains largely untouched by the current analysis is that of labor supply and its role in local economic development. Understanding the types of economic development the local labor supply can sustain depends not only on the capacity to characterize supply, but monitor how it interacts with local demand. Student specific records linked to labor market outcomes are essential to understanding whether or not, and how, the local supply of labor is linked to employer requirements for workers. Labor supply analysis indicates that 18 year olds tracked over extended periods tend to leave Wyoming's labor market. But, which youth (those attaining a two-year degree, a four-year degree, or those who do not attend any post-secondary education) and under what economic circumstances are they more likely to leave than others is unclear. What is clear, is that these questions cannot be fully addressed with paper-and-pencil tests, or the available summary data.

Selected Reports on Wyoming's Economic Expansion and Contraction

- Covered employment and wages for fourth quarter 2007: double-digit growth in total payroll
  http://doe.state.wy.us/LMI/0708/a1.htm

- Covered employment and wages for first quarter 2009: jobs and payroll decrease from year-ago levels
  http://doe.state.wy.us/LMI/1009/a1.htm

- Wyoming unemployment insurance benefit payments reach record high in 2009
  http://doe.state.wy.us/LMI/0210/a1.htm

- Covered employment and wages for first quarter 2010: net job losses slow
  http://doe.state.wy.us/LMI/1010/a1.htm

- Detailed covered employment and wages for second quarter 2010: growth in total payroll resumes
  http://doe.state.wy.us/LMI/0111/a1.htm

- Unemployment insurance benefit payments show recovery slowed in 2013
  http://doe.state.wy.us/LMI/trends/0514/a2.htm

- Local jobs and payroll in Wyoming in second quarter 2014: construction leads job growth
  http://doe.state.wy.us/LMI/trends/0115/toc.htm

Chapter 3: Outcomes for Students with Disabilities

by: Michele Holmes, Public Relations Specialist

In the 2010/2011 school year 14.8%, or 13,173, Wyoming public school students were classified as "Children With Disabilities" (U.S. Department of Education, 2012). The designation "Children With Disabilities" includes those students who had an Individualized Education Program (IEP) and/or a 504 Vocational Rehabilitation (VR) accommodation plan. The majority of the students classified in this manner by the U.S. Department of Education had an IEP. Because students with disabilities comprise a significant portion of the student population, and because labor market participation for adults with disabilities is significantly lower than the rest of the population, this chapter focuses on the completion rate and labor market participation rate for high school students with an IEP or 504 plan.

According to the U.S. Bureau of Labor Statistics, in 2013, 17.6% of persons with a disability were employed. The unemployment rate for persons with a disability was 13.2% in 2013, nearly double the rate for persons without a disability, 7.1%. (In the interest of full disclosure, the author of this chapter is a member of the Wyoming Governor's Council on Developmental Disabilities.)

Prior to the Workforce Data Quality Initiative Grant, the labor force involvement for Wyoming public school students with an IEP or 504 plan was not available at the sub-state level. The ability to identify where students work, what they earn, and their participation in the labor market during (and after) the high school years is critical to setting program goals and improving employment opportunities for those with a disability. Knowing the distribution of labor market participation at the sub-state level gives educators and policymakers empirical evidence on which to base workforce and education policy decisions. Therefore, it is prudent to examine participation in the labor market, earnings, and 12th grade completion rates for students with either IEP's or 504 accommodation plans in Wyoming public schools.

In addition to developing the tools whereby labor market information is available, Research & Planning (R&P) examines the high school participation rates and labor market participation rates for students with an IEP and/or a 504 accommodation as one measure of the effectiveness of school-based early intervention programs for students with a documented disability. At the moment, there is a lack of Wyoming-based longitudinal research on the effects of pre-kindergarten special education early intervention services. While research is clear that early intervention programs positively affect student readiness, little has been written about the availability of early intervention services in rural states like Wyoming. Because Wyoming is a rural state and access to early intervention services may be severely limited due to the geographic location of the family in need and the location of qualified service providers, the distribution of public school staff with early intervention service credentials (e.g., speech and language pathologists, occupational therapists, etc.) warrants examination.

Understanding the staffing patterns of

Wyoming public schools and the distribution of early-intervention service providers in the state is key in order to facilitate the effective delivery of programs and services which can impact the completion rate and labor market participation rate for individuals with disabilities. One example of improved service delivery might be helping the state's vocational rehabilitation agency identify students who are eligible for 504 programs at a younger age, so that students who would benefit from the program may have the opportunity to access vocational rehabilitation services before high school graduation. Understanding which school districts have access to licensed service providers and an adequate number and type of service providers is also necessary to ensure that early intervention needs are met for all Wyoming students who would benefit from such an intervention.

Given the challenges of a historically high unemployment rate for those with a disability, and the lack of longitudinal studies on the effect of pre-kindergarten early intervention programs in Wyoming schools, this chapter focuses on a sub-population of the 2010 senior cohort described in Chapter 4 – those with IEP's or 504 accommodation plans – and compares high school completion rates and labor market participation rates to the rest of the cohort. Of the 2010 senior cohort, 984 students (12.4%) had an IEP at some point in their academic career.

High School Graduation

See Table 3.1

Of the 7,919 students in the 2010 cohort, 30.8% (2,438) did not graduate high school that year. Slightly more males than females did not graduate (1,315 males and 1,123 females, respectively). Of the same cohort, and for students with an IEP plan anytime during their academic career (total = 984), 433, or 44.0%, did not graduate high school in 2010. More than half (27) of the 51 senior cohort students with a 504 accommodation plan, or 52.9%, did not graduate their senior year of high school.

Participation in the Labor Market

See Table 3.2, page 27

For the 2010 senior cohort, 584 students with an IEP (59.3%) were found working in wage records in 2010, compared with 68.7% of the general education population. A majority of students (56.7%) with IEP's had earnings in Wyoming (based on UI wage records in Wyoming) compared to 65.0% of students without an IEP. 26 students (2.6%) had earnings in other states based on wage records, compared to 3.6% for the total 2009/10 cohort. In other words,

Table 3.1: **Non-Graduates from Selected Population Segments of the 2009/2010 Cohort Year**

Population Segment	N	%
Total, All Secondary Students	**7,919**	**100.0%**
Did Not Graduate, Total	2,438	30.8%
Did Not Graduate, Females	1,123	
Did Not Graduate, Males	1,315	
Students with Individualized Educational Program (IEP)	984	100.0%
Did Not Graduate	433	44.0%
Students with 504 Accomodation Plan	51	100.0%
Did Not Graduate	27	52.9%

students with a disability were less likely to have exposure to an employment opportunity.

A total of 204 students with IEP's (20.7%) were enrolled in a post-secondary institution, compared with 3,287 (41.5%) of the overall cohort. Only 48 students (44.9%) with a 504 accommodation plan were found enrolled in a post-secondary institution in Wyoming or another state. For students with a 504 Accommodation Plan, 85 (79.4%) were found working in Wyoming or another state in 2010. While the percentage of students with 504 plans was higher than those students with IEP's, caution should be used when interpreting the data as the total number of students with a 504 plan is small in comparison to the number of students with an IEP plan.

Student Earnings, Employers, and Industry Worked

See Table 3.2, page 27 and Figure 3.1, page 28

Of the 2009/10 cohort, 68.7% were identified as working in Wyoming or another state in their senior year through wage records.

They earned an average of $6,566 that year, and the majority (65.0%) had wages in Wyoming. There were 288 (3.6%) who had wages in other states and their average earnings for the year were $6,502.

The average earnings for those with an IEP for the same year were $6,308, while the average earnings for students with a 504 accommodation plan was lower, at $5,810.

The 2009/10 cohort worked an average of 2.9 quarters in 2010. Students with an IEP and/or a 504 plan worked an average of 2.8 quarters that same year. The average number of employers for the 2009/10 cohort was the same for all three groups, at 1.7.

The majority of the 2010 senior cohort was found working in the leisure and hospitality (2,116) and retail trade (923) industries.

Among all non-graduates working in Wyoming, both females (302) and and males (254) were most often found working in leisure & hospitality.

Almost all of male non-graduates (97.7%) were not enrolled in a postsecondary program in Wyoming or another state, while 96.5% of female non-graduates were not enrolled in a postsecondary program in Wyoming or another state in 2010.

Future Research

Future research using administrative records could examine the graduation rates for students with IEP and 504 plans at the sub-state level, and also examine public school staffing patterns for IEP support personnel. Understanding staffing patterns and access to early intervention services, along with IEP duration and services, may improve service delivery for students with an IEP or 504 plan.

In addition, vital statistics could be examined alongside student records to

(Text continued on page 28)

Table 3.2: **Characteristics of Selected Segments of the 2009/10 12th-Grade Cohort**

Source Description	Data ID	Data Description	2007	2008	2009	Senior 2010	2011	2012	2013
All Secondary School Students (N = 7,919)									
Total Wage Records	2.0000	Number with Wages	3,421	4,825	4,868	5,439	5,596	5,473	5,381
	2.0010	Percent with Wages	43.2	60.9	61.5	68.7	70.7	69.1	68
	2.0030	Mean Annual Wage	$2,333	$3,604	$4,465	$6,566	$10,233	$13,167	$15,626
	2.0040	Mean Quarters Worked	2.3	2.7	2.9	2.9	3.1	3.2	3.3
	2.0050	Mean Number of Employers	1.5	1.6	1.5	1.7	1.9	1.9	1.9
WY Wage Records	2.0110	Percent with Wages	41.8	59.1	59.7	65.0	64.7	62.1	59.1
Retail Trade	2.3204	Number in Industry	474	771	867	923	903	765	743
Leisure & Hospitality	2.3216	Number in Industry	1,881	2,374	2,096	2,116	1,986	1,865	1,637
OS Wage Records	2.0200	Percent with Wages	1.4	1.8	1.8	3.6	5.9	7.0	8.9
NSC Any State Post-Secondary School	3.0100	Number Enrolled	109	591	1,232	3,287	3,275	2,803	2,518
	3.0110	Percent Enrolled	1.4	7.5	15.6	41.5	41.4	35.4	31.8
Individualized Educational Program (N = 984)									
Total Wage Records	2.0000	Number with Wages	405	531	526	584	615	609	612
	2.0010	Percent with Wages	41.2	54.0	53.5	59.3	62.5	61.9	62.2
	2.0030	Mean Annual Wage	$2,050	$3,344	$4,241	$6,308	$9,799	$13,603	$15,350
	2.0040	Mean Quarters Worked	2.3	2.6	2.7	2.8	3.0	3.2	3.3
	2.0050	Mean Number of Employers	1.5	1.7	1.5	1.7	2.0	1.9	1.9
WY Wage Records	2.0110	Percent with Wages	39.6	52.1	51.6	56.7	57.9	57.0	56.2
OS Wage Records	2.0200	Percent with Wages	1.5	1.8	1.8	2.6	4.6	4.9	6.0
NSC Any State Post-Secondary School	3.0100	Number Enrolled	7	22	70	204	197	145	114
	3.0110	Percent Enrolled	0.7	2.2	7.0	18.8	17.6	11.4	8.3
Section 504 Accommodation (N = 107)									
Total Wage Records	2.0000	Number with Wages	56	69	70	85	83	80	78
	2.0010	Percent with Wages	52.3	64.5	65.4	79.4	77.6	74.8	72.9
	2.0030	Mean Annual Wage	$1,900	$2,933	$3,598	$5,810	$9,679	$12,388	$13,521
	2.0040	Mean Quarters Worked	2.3	2.7	2.7	2.8	3.1	3.3	3.4
	2.0050	Mean Number of Employers	1.6	1.8	1.6	1.7	1.7	1.8	1.9
WY Wage Records	2.0110	Percent with Wages	51.4	62.6	64.5	73.8	70.1	65.4	61.7
OS Wage Records	2.0200	Percent with Wages	*			5.6	7.5	9.3	11.2
NSC Any State Post-Secondary School	3.0100	Number Enrolled		7	19	48	48	39	37
	3.0110	Percent Enrolled		6.5	17.8	44.9	44.9	36.4	34.6
Did Not Graduate, Females (N = 1,123)									
Total Wage Records	2.0000	Number with Wages	467	573	537	582	600	591	565
	2.0010	Percent with Wages	41.6	51.0	47.8	51.8	53.4	52.6	50.3
	2.0030	Mean Annual Wage	$2,255	$3,538	$4,658	$6,332	$8,232	$9,918	$11,286
	2.0040	Mean Quarters Worked	2.4	2.6	2.8	2.8	3	3.2	3.2
	2.0050	Mean Number of Employers	1.6	1.9	1.8	1.9	1.9	1.9	2.0
WY Wage Records	2.0110	Percent with Wages	40.0	47.9	43.2	43.3	42.7	41.6	38.6
Leisure & Hospitality	2.3216	Number with Wages	329	374	299	302	289	286	244
OS Wage Records	2.0200	Percent with Wages	1.6	3.1	4.6	8.5	10.8	11.0	11.8
NSC Any State Post-Secondary School	3.0610	Percent Not Enrolled	100.0	98.2	96.3	96.5	97.5	98.0	98.1
Did Not Graduate, Males (N = 1,315)									
Total Wage Records	2.0000	Number with Wages	584	702	649	668	721	696	693
	2.0010	Percent with Wages	44.4	53.4	49.4	50.8	54.8	52.9	52.7
	2.0030	Mean Annual Wage	$2,820	$4,391	$5,720	$9,148	$13,464	$16,491	$18,825
	2.0040	Mean Quarters Worked	2.4	2.6	2.6	2.8	3.0	3.1	3.2
	2.0050	Mean Number of Employers	1.8	1.9	1.7	1.9	2.0	2.0	2.0
WY Wage Records	2.0110	Percent with Wages	42.6	50.0	44.9	43.3	45.9	43.6	43.0
Leisure & Hospitality	2.3216	Number with Wages	337	365	301	254	228	220	192
OS Wage Records	2.0200	Percent with Wages	1.8	3.4	4.5	7.5	8.9	9.4	9.7
NSC Any State Post-Secondary School	3.0610	Percent Not Enrolled	100.0	100.0	100.0	93.3	100.0	100.0	100.0

* Black cells indicate non-discloseable data.
Source: Appendix A&B and non-published data, T. Glover, 2015.

(Text continued from page 26)

examine the correlation of first births with earnings and high school completion rates. Shifting the analysis from the individual to the household level would allow for a better understanding of how major life events shape labor market interaction and high school completion rates for students regardless of special education status.

While directions for future research are broad, the statistical application of WDE student data and administrative records affords interested parties and service providers tools to improve the planning and delivery of services to the student population with special needs. In addition, the data in this report offer those with oversight responsibility for early intervention and special education delivery – such as Head Start, Child Development Services of Wyoming, the Wyoming Department of Education, school boards, the Wyoming State Legislature, and the Wyoming Governor's Council on Developmental Disabilities – with an additional empirical and effective tool to carry out their duties.

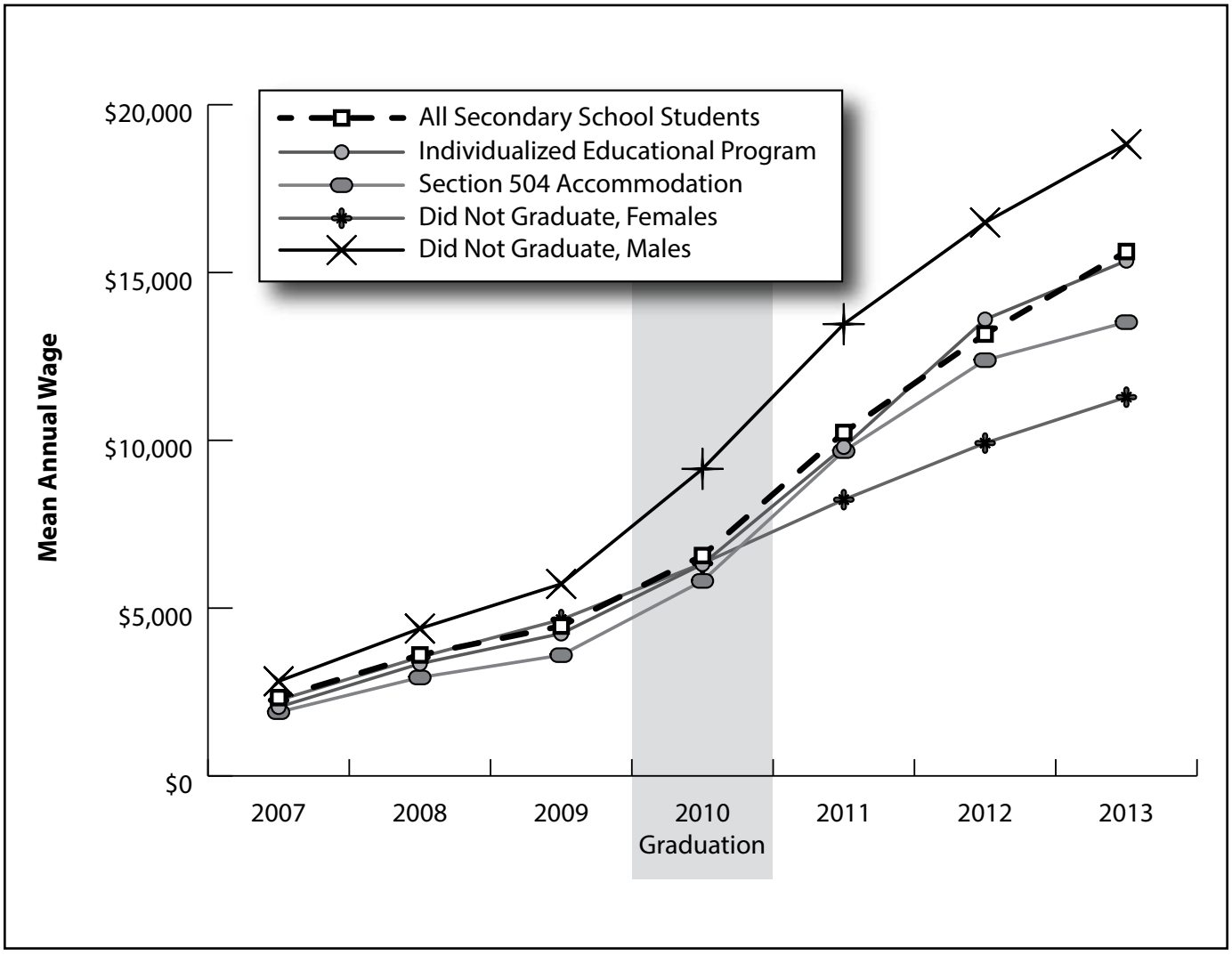


Figure 3.1: **Mean Annual Wage of Selected Segments of the 2009/10 Cohort Year**

A Methodological Note to Chapter 4: School Turnover and the Instability Index

by: Lynae Hammer, Office Support Specialist, and Tom Gallagher, Manager

Turnover describes job leavers requiring replacement by their former employer. Turnover in the workforce results in hiring and training costs for employers and job search costs for workers. Applying the concept of turnover to students and schools can help create a picture of the costs of students changing schools.

Figure 4.1 (see page 30) provides a comparison of student turnover rates between Crook and Converse counties. The measurement of graduation rates involves similar manipulations of information about students entering school, attendance, and graduating. This section discusses the comparison of student turnover and the standard approach to the calculation of graduation rates.

The graduation rates of Crook and Converse counties are similar and above 90 percent. The graduation rate formula, known as the 4-year adjusted cohort graduation rate, from the National Center for Education Statistics (NCES) divides the number of students who earned a diploma during the completion year by the number of first-time 9th graders plus the students who transferred into the school, minus the students who transferred out of the school, emigrated, or died during the prior four years. The data used in this exercise does not differentiate between students who transferred to another district and students that died, or students that both transferred in and out. Therefore, the formula in Figure 4.1 differs somewhat from NCES's 4-year adjusted cohort rate. The computations are presented in Table 4.3. For the purpose of this section, students transferring in (B) are students that were not enrolled in the ninth grade and students transferring out (C) are students that were not enrolled in the twelfth grade. The cohort graduates (D) are students that received their diploma in 2010.

As seen in Figure 4.3, in Crook County, a total of 25 students transferred either in or out, or both in and out, and a total of 119 students were enrolled at some point during the four years, with a graduation rate of 93.8 percent. On the other hand, student turnover is calculated by dividing the number of students who transferred in, out, or both, by the total number of students that were enrolled within the four years. With 25 students that transferred in, out, or both, and 119 students enrolled at any time between 2007 and 2010, the student turnover rate in Crook County was 21 percent. The graduation rate in Converse County was slightly lower than Crook County at 91 percent; however, the student turnover was more than double that of Crook County at 42.2 percent. Converse County had 122 students transfer in, out, or both, between 2007 and 2010 and had a total of 289 students enrolled during that time. With a graduation rate only three percent less, and twice the turnover rate of Crook County, Converse County may have experienced higher costs of integrating students into mainstream educational program activities.

In comparison with older workers, the interaction between young people

and employers in Wyoming in the labor market is highly unstable (see the instability index discussion in chapter 2). Establishing continuity with employers in the market requires strategies of successfully engaging employers multiple times within a short space of time in contrast to older workers. At the same time high school students are often also negotiating multiple relationships with educational entities. These two dynamics dissipate for most people in Wyoming with aging. Negotiating success in both employment and school environments for some students appears to be a simultaneous phenomenon that may be important to explore in determining how outcomes are affected by stability with school and work.

Crook County

A) 94 9th Graders enrolled at the beginning of the year
B) Students transferred in = 14
C) Students transferred out = 11
D) Cohort Graduates = 91

Crook County Student Graduation Rate

$$\frac{\text{D) } 91}{\text{A) } 94 + \text{B) } 14 - \text{C) } 11} = 93.8\%$$

E) B + C = 25
F) A + B + C = 119

Crook County Student Turnover

$$\frac{\text{E) } 25}{\text{F) } 119} = 21.0\%$$

Converse County

A) 167 9th Graders enrolled at the beginning of the year
B) Students transferred in = 83
C) Students transferred out = 39
D) Cohort Graduates = 192

Converse County Student Graduation Rate

$$\frac{\text{D) } 192}{\text{A) } 167 + \text{B) } 83 - \text{C) } 39} = 91.0\%$$

E) B + C = 122
F) A + B + C = 289

Converse County Student Turnover

$$\frac{\text{E) } 122}{\text{F) } 289} = 42.2\%$$

The following formula provides an example of how the 4-year adjusted cohort graduate rate would be calculated for the cohort entering 9th grade for the first time in the 2008-09 school year and graduating by the end of the 2011-12 school year:

$$\frac{\text{Number of cohort members who earned a regular high school diploma by the end of 2011-12 school year}}{\text{Number of first-time 9th-graders in fall 2008 (starting cohort) plus students who transferred in, minus students who transferred out, emigrated, or died during school years 2008-09, 2009-10, 2010-11, and 2011-12}}$$

Source: National Center for Education Statistics (2014). Public High School Four Year On-Time Graduation Rates and Event Dropout Rates. Washington, D.C.: National Center for Education Statistics. Retrieved from: http://nces.ed.gov/pubs2014/2014391.pdf

Figure 4.1: School Student Turnover Rate for Two Counties in Wyoming, 2007-2010. For discussion, see page 29.

Chapter 4: WDQI Methodology — How We Built It

by: Tony Glover, Workforce Information Supervisor

***"Data! Data! Data!" he cried impatiently. "I can't make bricks without clay." - Sherlock Holmes,* The Adventure of the Copper Beeches**

This report is based on combining multiple longitudinal databases collected during the administration of public programs in Wyoming, the nation, and selected states. This is the first report from the Workforce Data Quality Initiative (WDQI) grant and to this point only includes data from the Wyoming Department of Education (WDE), the National Student Clearinghouse (NSC), Wyoming Department of Workforce Services (WDWS), and the Wyoming Department of Transportation. This report also includes administrative records from the Unemployment Insurance (UI) systems of other states. Future reports will incorporate data from the Wyoming Community College Commission, the University of Wyoming, Workforce Investment Act trainees, Hathaway Scholarship awardees, and other education and workforce training programs. Future reports will reflect the complexity of additional data sources.

The data presented in the first three chapters were based on a large set of tables similar to Table 4.1 (see page 32). For example, the data used for the 2009/10 Cohort graduates to create Figure 2.1 and Table 2.1 in Chapter 2 are shown with a thick border in Table 4.1. Similar tables for students ever having a Section 504 Accommodation or an Individualized Education Program (IEP) were used in Chapter 3. The entirety of the report containing tables like Table 4.1 when presented for all groups of interest, ***Cohort Year***, ***Completion Statuses***, ***Geographical Areas***, and ***Gender*** is 39,531 pages long. The complete tables for the 2009/10 ***Cohort Year*** cohort with all ***Completion Statuses*** (Total, Graduates, and Non-graduates) at the Statewide and Sub-State region are attached as Appendix A. Appendix B includes the same data for the county level and is available at http://doe.state.wy.us/LMI/education_we_connect/WDQI_Pub1_Appendix_B.pdf.

Chapters 2 and 3 of this report are applications of data organized by the methods outlined in this chapter. Chapters 2 and 3 create information about the interactions of Wyoming secondary school participants with the world, or at the very least, the economic environment in which they interact. This chapter, on the other hand, represents an attempt to organize data in an informative way, to facilitate the application of the data, as done in Chapters 1 and 2 of this report. The difference between this chapter and its predecessors is best described by Sherlock Holmes: "Data! Data! Data!" he cried impatiently. "I can't make bricks without clay." This chapter is about gathering clay, while the first two are about making bricks.

This chapter introduces the terminology, methods, and operational definitions used throughout this report. The next section "**Grouping Dimensions**" describes some limitations of the enrollment data used and how the data were organized to describe different subsets of the students enrolled. The second section describes the outcomes data which include employment, wages, employer, and labor force attachment during secondary enrollment and following

(Text continued on page 33)

Table 4.1: Wyoming High School Graduates from 2009/10 Cohort Year by Calendar Year, 2007-2013 (Total N = 5,481)

Item 1 Cohort Year: 2009/10 **Item 2 Completion Status:** Graduate HS
Item 3 Geographic Area: Total **Item 4 Gender:** Total

Source Description		Data Description	Calendar Year 2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Wyoming High School Graduates from 2009/10 Cohort Year (N = 5,481, 100.0%)												
Total Wage Records	Item 5	Number with Wages				2,370	3,550	3,682	4,189	4,275	4,186	4,123
	Item 6	Percent with Wages				43.2	64.8	67.2	76.4	78.0	76.4	75.2
	Item 7	Median Annual Wage				$1,513	$2,684	$3,318	$4,689	$7,265	$9,693	$11,192
	Item 8	Mean Annual Wage				$2,229	$3,461	$4,216	$6,187	$9,969	$13,073	$15,683
	Item 9	Mean Annual Quarters Worked				2.3	2.7	2.9	2.9	3.1	3.2	3.3
	Item 10	Mean Number of Employers				1.4	1.5	1.5	1.7	1.9	1.9	1.8
	Item 11	Mean Instability Index				81.1	74.7	69.7	70.3	70.6	67.7	66.4
WY Wage Records		Number with Wages				2,305	3,485	3,652	4,095	4,044	3,880	3,679
		Percent with Wages				42.1	63.6	66.6	74.7	73.8	70.8	67.1
Other States Wage Records		Number with Wages				65	65	30	94	232	306	444
		Percent with Wages				1.2	1.2	0.5	1.7	4.2	5.6	8.1
		Median Annual Wage				$1,358	$1,407	$2,052	$3,171	$5,175	$7,327	$8,820
		Mean Annual Wage				$2,994	$3,456	$10,575	$6,837	$8,677	$11,951	$13,159
		Mean Quarters Worked				1.8	2.1	2.4	1.9	2.7	2.9	3.0
		Mean Number of Employers				1.1	1.4	2.8	2.0	2.1	2.0	1.8
		Mean Instability Index				87.8	83.3	81.5	83.4	74.1	71.0	68.2
Other States[a]						x	x	x	x	x	x	x
Wage Range Data	Item 12					x	x	x	x	x	x	x
Primary Industry Data	Item 13					x	x	x	x	x	x	x
NSC[b] Any State Post-Secondary School		Number Enrolled				104	560	1,166	3,218	3,227	2,768	2,487
		Percent Enrolled				1.9	10.2	21.3	58.7	58.9	50.5	45.4
Post-Secondary Wyoming		Number Enrolled				102	549	1128	2527	2447	1973	1678
		Percent Enrolled				1.9	10.0	20.6	46.1	44.6	36	30.6
Post-Secondary Wyoming & Other		Number Enrolled				*		19	191	124	155	72
		Percent Enrolled						0.3	3.5	2.3	2.8	1.3
Post-Secondary Any Other State		Number Enrolled					11	19	500	656	640	737
		Percent Enrolled					0.2	0.3	9.1	12	11.7	13.4
Not Enrolled Post-Secondary		Number Not Enrolled				5,377	4,921	4,315	2,263	2,254	2,713	2,994
		Percent Not Enrolled				98.1	89.8	78.7	41.3	41.1	49.5	54.6

x = Data are present in these cells in Appendix Table 1.

*Black cells indicate data that are not discloseable due to confidentiality.

[a]Appendix Table 1 includes Number with Wages, Percent with Wages, Median Annual Wage, Mean Annual Wage, Mean Quarters Worked, Mean Number of Employers, and Mean Instability Index for these states: AK, CO, ID, MT, NE, NM, OH, OK, SD, TX, and UT.

[b]NSC = National Student Clearinghouse.

(Text continued from page 31)

secondary completion. The NSC data provides another outcomes indicator of whether or not individuals were enrolled in post-secondary institutions following secondary completion. Labor force and post-secondary enrollment data independently offer a wealth of information. When the data sets are combined they portray more complex relationships and begin to describe how choices following secondary enrollment impact long term career and wage progression. Lastly, we will touch on future data and publications that will be made possible by the WDQI grant.

Methods

Grouping Dimensions (see Table 4.2,)

Wyoming Department of Education data files

The Wyoming Department of Education collects data on teacher, course of study, and student enrollment from Wyoming school districts three times a year. The compiled data collection is referred to as the WDE684 and includes "all student enrollment records between the beginning of the school year and the collection date

Table 4.2: Grouping Dimensions of the Wyoming Data Quality Initiative Preliminary Report

Cohort Year	*Completion Status*	*Geographic Area*	*Gender*
	Total	Total	Total
2006/07	Enrolled 12th (2006/07 to 2008/09)	Sub-State Region	Male
2007/08	Not-Enrolled 12th (2006/07 to 2008/09)	Casper MSA	Female
2008/09		Cheyenne MSA	
		Central Southeast	
2009/10	Graduate (2009/10 to Present)	Northeast	
2010/11	Non-Graduate (2009/10 to Present)	Northwest	
2011/12		Southwest	
2012/13		County (23 Total)	
2013/14		Albany	
		*	
		*	
		*	
		Weston	
		School District (50 Total)	
		101000	
		*	
		*	
		*	
		7700049	

Cohort Year - Is defined as the year the secondary student DID or WOULD HAVE graduated from high school based on their last year of enrollment and highest grade achieved at that time. For example, a student that was enrolled in the 9th grade in the 2006/07 school year was assigned to the 2009/10 Graduating Class Cohort regardless of whether or not the student attended 10th, 11th, and/or 12th grades.

Completion Status - For the school year 2009/10 to present a student is defined as a Graduate if they have achieved an exit type of 108 or 124 "Graduated with a Wyoming regular high school diploma" otherwise they are defined as a Non-Graduate. Exit type is not available for the 2006/07 to 2008/09 Cohorts and the Completion Status is either Enrolled in 12th grade or Not-Enrolled in 12th Grade.

Geographical Area - Is defined by the last school district in which the student was enrolled. County and Sub-State Regions are detailed at http://doe.state.wy.us/LMI/oes.htm.

Gender - Male or Female as assigned to the last enrollment record of the student.

are to be submitted, including records for students exiting prior to a collection date. As a result, it will be likely for multiple records per student to be reported" (WDE684 - WISE Teacher/Course/Student Enrollment through March 20, 2015). The entirety of this report is based on data reported during the March collection period of the WDE684 for the school years 2006/07 through 2013/14. The data were used to create the primary **Grouping Dimensions** that appear in Table 4.2.

The first grouping in Table 4.2 is named ***Cohort Year*** (in Table 4.1, Item 1) and represents the school year in which the individual student from the WDE684 enrollment records did *or would have* completed their secondary education. This includes students who actually participated as seniors in the ***Cohort Year***, as well as those who were enrolled in the 9th, 10th, and/or the 11th grades in previous school years who did not participate in the ***Cohort Year*** in Wyoming. Table 4.3 (see page 35) shows the number of students assigned to the 2009/10 ***Cohort Year*** by grade participation from 9th to 12th grade. ***Cohort Years*** follow the school year (SY) calendar and for the 2009/10 cohort it represents enrollment from July 2009 to June 2010.

A review of Table 4.3 shows that 6,361 (80.3%) of the students assigned to the 2009/10 cohort were enrolled during their ***Cohort Year***. The remaining 1,558 (19.7%) did not participate in their ***Cohort Year***. It is important to note that participation in the ***Cohort Year*** is not synonymous with graduation and receiving a diploma. Likewise, non-participation in the Cohort Year can be due to several factors including leaving Wyoming, early graduation (those that completed all requirements for a diploma by their junior year), death, as well as dropping out of school, and other causes. The decision to group the data by **Cohort Year** was made to account for all secondary school (grades 9 through 12) students enrolled in Wyoming as part of both the education system and/or the labor force.

The second grouping dimension in Table 4.2 is ***Completion Status*** (in Table 4.1, Item 2) is divided into four; Enrolled 12th, Not-Enrolled 12th, Graduate, and Non-Graduate. The WDE684 system collects a data element named "exit type" from the 2009/10 to present, but not in prior years, which captures whether a diploma was awarded to the student. Therefore, for the Cohort Years 2009/10 to 2013/14 graduates are defined as students that receive one of the following exit types in the WDE684; "108 - Graduated with a Wyoming regular high school diploma AND completed district defined college-bound course of study" or "124 - Graduated with a Wyoming regular high school diploma BUT WITHOUT having completed the district defined college-bound course of study" (WDE684, 2015) at any time during enrollment. Non-Graduates for the same time period, 2009/10 to 2013/14, are students that did not have an exit type of 108 or 124 listed in their enrollment records.

Data were compiled for **Cohort Years** 2009/10 to 2012/13 cohorts and the ratio of graduates relative to **Cohort Year** participation (in 12th grade) were calculated for each year. Of all students enrolled in the 12th grade during the 2009/10 to 2012/13 ***Cohort Years*** (Table 4.3, 25,156) 22,032 or 87.6% graduated and received a diploma. To

(Text continued on page 36)

Table 4.3: **Cohort Year and Completion Status by Grade Participation 2006/07 to 2012/13**

Cohort Year	Grade Participation g09	g10	g11	g12	Completion Status Not Enrolled 12th	Enrolled 12th	Total	
2006/07				X	0	5,598	5,598	5,598
2007/08			X	X	0	5,079	5,079	Enrolled 12th
				X	0	450	450	5,529
			X		792	0	792	792
Total					792	5,529	6,321	
2008/09		X	X	X	0	4,695	4,695	
				X	0	285	285	
			X	X	0	268	268	Enrolled 12th
		X		X	0	142	142	5,390
		X			916	0	916	
		X	X		529	0	529	Not Enrolled 12th
			X		203	0	203	1,648
Total					1,648	5,390	7,038	

Cohort Year	Grade Participation g09	g10	g11	g12	Completion Status Non-Graduate	Graduate	Total	
2009/10	X	X	X	X	195	4,614	4,809	
		X	X	X	196	356	552	
			X	X	148	222	370	
				X	185	180	365	
		X		X	99	25	124	
	X	X		X	38	29	67	
	X		X	X	26	29	55	Enrolled 12th
	X			X	12	7	19	6,361
	X				586	0	586	
	X	X			367	0	367	
		X			265	0	265	
	X	X	X		133	14	147	
			X		90	2	92	
		X	X		83	2	85	Not Enrolled 12th
	X		X		15	1	16	1,558
Total					2,438	5,481	7,919	
2010/11	X	X	X	X	301	4,779	5,080	
		X	X	X	85	261	346	
				X	137	178	315	
			X	X	59	167	226	
	X		X	X	19	56	75	
	X	X		X	20	54	74	
	X			X	12	20	32	Enrolled 12th
		X		X	9	21	30	6,178
	X				560	0	560	
	X	X	X		432	79	511	
		X	X		178	14	192	
			X		176	8	184	
	X	X			172	0	172	
		X			98	0	98	Not Enrolled 12th
	X		X		34	1	35	1,752
Total					2,292	5,638	7,930	

Cohort Year	Grade Participation g09	g10	g11	g12	Completion Status Non-Graduate	Graduate	Total	
2011/12	X	X	X	X	364	4,832	5,196	
		X	X	X	69	215	284	
				X	110	162	272	
			X	X	63	144	207	
	X	X		X	26	68	94	
	X		X	X	13	32	45	
		X		X	11	10	21	Enrolled 12th
	X			X	8	10	18	6,137
	X	X			691	2	693	
	X	X	X		428	65	493	
		X			327	0	327	
	X				245	0	245	
			X		134	2	136	
		X	X		101	9	110	Not Enrolled 12th
	X		X		13	0	13	2,017
Total					2,603	5,551	8,154	
2012/13	X	X	X	X	627	4,910	5,537	
				X	118	162	280	
		X	X	X	56	202	258	
			X	X	58	167	225	
	X	X		X	33	60	93	
	X		X	X	13	35	48	
		X		X	9	12	21	Enrolled 12th
	X			X	5	13	18	6,480
	X	X	X		536	52	588	
	X				587	0	587	
	X	X			556	3	559	
		X			190	0	190	
			X		114	4	118	
		X	X		80	5	85	Not Enrolled 12th
	X		X		20	3	23	2,150
Total					3,002	5,625	8,630	

X = Included in the WDE684 system.

(Text continued from page 34)

maintain continuity throughout the report, a student with a ***Cohort Year*** from 2006/07 to 2008/09 is defined as enrolled 12th if they were enrolled in the 12th grade, which is comparable to the graduates of later ***Cohort Years***. If the student was not enrolled in the 12th grade they are designated as a Not-Enrolled 12th for ***Cohort Years*** from 2006/07 to 2008/09.

The last two **Grouping Dimensions** appearing in Table 4.2 are relatively simple and we briefly touch on them in this paragraph. ***Geographical Area*** (see Table 4.1, Item 3) is based on the last school district ID listed on the last enrollment record for the student in the WDE684 enrollment data. County and Sub-State Regions were assigned as the ***Geographical Area*** in which the school district belongs. While data are compiled at the county and school district level this current report only presents the sub-state regions and total levels. The last dimension in ***Gender*** (see Table 4.1, Item 4) is presented as Male and Female.

The unique identifier of the WDE684 enrollment files are the Wyoming Integrated Statewide Education Record Identifiers (WISER ID). The files also include first name, last name, gender, and date of birth. The later data items were used to match the WISER IDs to Social Security Numbers (SSN) from the combined administrative databases (Driver's License, UI Claims, Workers Compensation Claims, Wyoming at Work, etc) at Research & Planning. Of the 59,530 WISER IDs, encompassing the ***Cohort Years*** 2006/07 to 2012/13, 52,861 (88.8%) were successfully matched to SSNs. Students falling into the enrolled 12th grade for 2006/07 to 2008/09 or those who were graduates from 2009/10 to 2012/13 were more likely to be matched to an SSN with 36,769 of the 38,999 or 94.3% than non-graduates/not enrolled in 12th grade with 16,092 of the 20,531 or 78.4% matched. These findings concur with the hypothesis that students with ***Completion Statuses*** of graduates/ enrolled 12th were more likely to have established an extensive administrative records trail than those that could have left the state prior to attending their senior year.

This last step, matching WISER IDs to SSN, was necessary to match the students to their workforce data discussed in the next section.

Outcomes Data

Unemployment Insurance Wage Records

Wage Records (WR) are collected for the administration of the UI claims systems in all states. The data are used to determine eligibility and benefit levels for unemployment claimants. The data include SSN, Year, Quarter, UI Account Number (employer), and Wages. As a point-in-time observation the wage data are of limited utility but when combined across time, patterns of wage progression and job attachment (turnover) can be identified. Research & Planning has entered into wage records sharing agreements with research offices in Alaska, Colorado, Idaho, Montana, Nebraska, New Mexico, Ohio, Oklahoma, South Dakota, Texas, and Utah and can add the dimension of interstate geographic mobility. Lastly, R&P also collects the Quarterly Census of Employment and Wages which captures data related to UI accounts; industry, ownership, size, and geographic location

within Wyoming. The data related to labor force outcomes presented in this report cross all of these dimensions.

Wage Records preparation included aggregating individual SSN data to a calendar year level from quarterly data. The aggregate data included primary state, primary county, primary industry (custom two digit NAICS aggregates), total wages, number of distinct quarters worked, number of distinct employers, a count of the total number of transactions (SSN, year, quarter, UI account combinations), and a count of the total number of transactions in transition status (hire, exit, or both a hire and exit). Primary state, county, and industry are defined as the state, county, or industry paying the greatest total wages in the year. The combination of total transactions in turnover divided by the total of all transactions in the year creates a percent of transactions in turnover which is defined as the instability index (Glover & Peters, 2000).

Wage records data are shown for Wyoming and partner states for the following items.

Number with Wages (Table 4.1, item 5) – Count of distinct SSNs with wages in their primary state in the outcome years (calendar year (CY) 2007 to 2013).

Percent with Wages (Table 4.1, item 6) – The number individuals with wages divided by the total possible number in the cohort year. For example, in table 4.1 there are 2,370 students with wages in CY 2007 of the total 5,481 students that graduate in 2009/10 or 43.2%.

Median Annual Wage (Table 4.1, item 7) – If you take the 2,370 students with wages in CY2007 and ordered them by their total wages the Median measures the halfway point with regard to wages. For example, the 1,185th & 1,186th students bound the mid-point and $1,513 is the average of the two students' wages in CY 2007.

Mean Annual Wage (Table 4.1, item 8) – The mean annual wage is the average of the wages paid to the 2,370 students. For example, the sum the wages paid to the 2,391 students in CY2007 was $5,282,730, divided by the number of students with wages 2,370, equals a mean (average) of $2,229 per student.

Mean Annual Quarters Worked (Table 4.1, item 9) – Wage records data are aggregated to the SSN and Calendar Year level before being matched to the student enrollment records. During the aggregation the distinct number of quarters (i.e. first quarter January – March) are counted. The most quarters an individual could have are four and the least is one. This number represents the average number of quarters worked in the year across all individuals that worked.

Mean Number of Employers (Table 4.1, item 10) – Similarly, the number of distinct employers from which the SSN receives wages is counted in the calendar year. This number is the average number of distinct employers per individual, as counted by UI accounts.

Mean Instability Index (Table 4.1, item 11) – As mentioned previously the total number of transactions (defined as the SSN with a UI in the year and quarter) in hire, exit or both hire and exit turnover are counted at the SSN in the calendar year level. This is then divided by the total number of transactions

to calculate a percent of the SSNs transactions that are in a turnover state for each year. This number represents an average of the percentages during the calendar year.

Wage Ranges - number and percent (Table 4.1, item 12)

Wage Range $1 to $5,000 - The number of SSNs with total of all wages paid in the calendar year between $1 and $5,000.
Wage Range $5,000 to $10,000 – see Wage Range $1 to $5,000
Wage Range $10,000 to $20,000
Wage Range $20,000 to $30,000
Wage Range $30,000 to $40,000
Wage Range $40,000 to $50,000
Wage Range $50,000+

Primary Industry – number and percent (Table 4.1, item 13)

Goods Producing Industries – Number of persons with the most total wages in the year in the industry
- **Agriculture, Forestry, Fishing, & Hunting (11)**
- **Mining (21)**
- **Construction (23)**
- **Manufacturing (31, 32, 33)**

Services Producing Industries
- **Wholesale Trade, Trans., Utilities, & Warehousing (42, 48, 49, 22)**
- **Retail Trade (44, 45)**
- **Information (51)**
- **Financial Activities (52, 53)**
- **Professional & Business Services (54, 55)**
- **Educational Services (61)**
- **Health Services (62)**
- **Leisure & Hospitality (71, 72)**
- **Other Services (81)**

Public Administration
Unclassified

National Student Clearinghouse (NSC)

The NSC databases are queried by the WDE to ascertain secondary student's enrollment in post-secondary institutions. The query returns post-secondary enrollment hits for institutions in Wyoming and across the country. While Research & Planning is currently in the process of acquiring post-secondary files from Wyoming's seven community colleges and the University of Wyoming the data are limited to the borders of Wyoming. Therefore data from the NSC database were abstracted and presented in this report.

NSC data are presented for the following items:

Any Post-Secondary Enrollment – number and percent (Table 4.1, item 14) the number of WISER IDs that showed up in the NSC database in the given calendar year.

Post-Secondary Enrollment Wyoming – Number and percent enrolled in a post-secondary program in Wyoming only during the calendar year.

Post-Secondary Enrollment Wyoming & Another State – Number and percent enrolled in a post-secondary program in Wyoming and another state during the calendar year.

Post-Secondary Enrollment Any Other State – Number and percent enrolled in a post-secondary program in another state only during the calendar year.

Discussion

Some of the data presented in Chapters

2 & 3 (post-secondary enrolled & working, not enrolled and working, Section 504 Accommodation, and Individualized Education Program) are not presented in this chapter or Appendices A and B. In reviewing Appendix A the reader will discover that all tables are labeled "Table 1: All Secondary Students" the information displayed immediately following the title are the dimensions discussed earlier in this chapter and differentiate the tables from each other. For example, Appendix A, Page 1, shows data for All Secondary Students with a Cohort Year: 2009/10, a Geographic Area: Total, a Gender: Total, and a Completion Status: Total. In contrast Appendix A Page 31 shows All Secondary Students with a Cohort Year: 2009/10, a Geographic Area: Casper MSA, a Gender: Total, and a Completion Status: Non-Graduate HS. The tables in Chapter 2 and 3 were pulled from the much larger report and show data for distinct sub-groups taken from the major group of all students.

The first of these sub-groups discussed in Chapter 2 were individuals that were concurrently enrolled in post-secondary education with wages in wage records and individuals that had wages in wage records that were not enrolled in post-secondary education at the same time. Chapter 3 introduced the sub-groups of students that have ever had a Section 504 Accommodation and the students that have ever had an Individualized Education Program. These four sub-groups are used to further demonstrate the use of data as a real life application. The full report has the following tables (R&P is only releasing Table 1 at this time) and the data for Chapter 2 was pulled from Tables 3 & 4 (listed below) and the data for Chapter 3 was pulled from Tables 4 & 5 (listed below):

Table 1: All Secondary Students
Table 2: Not Enrolled in Post-Secondary with Wages in Wage Records
Table 3: Concurrently Enrolled in Post-Secondary with Wages in Wage Records
Table 4: Section 504 Accommodation
Table 5: Individualized Educational Program
Table 6: Gifted & Talented Program
Table 7: Never Enrolled in Post-Secondary School
Table 8: Ever Enrolled in Post-Secondary School

The eight sub-groups were selected by staff of R&P as areas of cross-cutting interest. There are an infinite number of sub-groups for which data could be generated. For example, someone could be interested in the long-term labor force participation for students that were enrolled in all four years of high school (grades 9 through 12) compared to those that were not enrolled in all four years of high school. Currently, R&P is creating tables that include individuals that were listed as receiving a post-secondary degree in the NSC database compared to individuals that did not receive a post-secondary degree. The data produced in this report and the tables currently in production will be used to create the contextual environment for Hathaway Scholarship participation.

R&P is scheduled to receive data for all Wyoming colleges and the University of Wyoming later this year. The addition of new data sources, as well as the continued collection of more recent versions of currently utilized data sources, creates a situation where the data presented in this document will change. For example, a WISER_ID for which we cannot currently find an SSN match may be identified when we acquire the community college data or a more current download of the driver's license database. This in turn has the potential to increase the number of students found working in

wage records. It is important when utilizing the data from this report that users identify the date on which the data were published. Community college and university data will be used.The data will be used to create tables similar to the ones in this publication. Collectively the tables crossing educational levels and training programs will create a series of detailed dash boards describing labor force outcomes. While informative, the dashboards are only descriptive. They offer a launching point from which to begin working towards the more important goal of the WDQI, understanding the combinations of education and training that lead to success in the labor force. Indeed, the dashboards offer insight into how we will eventually define the concept of success.

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