An Initial Exploration of Colorado-Trained Teachers: Providing Context for Outcomes-Based Teacher Preparation Program Evaluation

PROJECT REPORT

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Overview

As the body of research on the importance of teacher quality grows, increased scrutiny is generally being placed on the educator pipeline and, more specifically, on teacher preparation programs. Recent legislation in Colorado (SB 10-036 and SB 11-245) requires the Colorado Department of Higher Education (DHE) to track the outcomes of graduates of teacher preparation programs. As a result, there is a push to link in-service teachers to their preparation programs and examine program outcomes that include, but are not limited to, the demographic characteristics of the teaching force produced, where and with which students these teachers work, and, ultimately, the impact they have on the achievement of their students.

In this report, we investigate the demographic characteristics and placement patterns of a subpopulation of teachers prepared through traditional routes in Colorado.[1] This context is important for determining the appropriateness of methodologies that will ultimately be used to attribute student outcomes to the preparation programs of their teachers. We demonstrate that the demographics of teacher candidates and the schools where they ultimately teach are strongly influenced by regional factors. In many cases, the bulk of the completers from a particular IHE tend to teach in similar kinds of schools in terms of student demographics and achievement characteristics. If teacher candidates were randomly assigned to preparation programs and, upon completion of training, randomly assigned to the schools where they work, it would be easier to disentangle the impact of a particular teacher preparation program on student outcomes. This report demonstrates just how far Colorado is away from the ideal evaluation design of random assignment.

One thing to keep in mind while reading this report is that, unlike many other states where the vast majority of teachers are prepared by traditional in-state preparation programs, only half of Colorado teachers are prepared in-state (Reichardt, Paone, and Badolato, 2006). Furthermore, many teachers prepared by Colorado Institutions of Higher Education (IHEs) do not subsequently teach in Colorado. Thus, the roster of Colorado public school teachers differs from the full population of teachers that have been prepared by Colorado IHEs, and inferences

[1] The term *traditional* is used in this report to distinguish university-based, non-alternative routes from alternative licensure routes to initial teacher licensure.

made about preparation program quality based only on the subset of teachers practicing in Colorado may not be generalizable.

This project was taken on collaboratively by researchers from University of Colorado Boulder, University of Colorado Denver, and University of Northern Colorado and uses data from the Colorado Department of Education (CDE) and DHE to address the following research questions:

1) What are the demographic characteristics of Colorado teachers who recently received their initial teacher preparation at Colorado IHEs? How do these demographics vary by IHE?
2) How do recent completers' placement rates in Colorado school districts compare across IHEs?
3) How do the K-12 schools where recent completers from Colorado IHEs are placed differ in terms of demographic and achievement characteristics?
4) How do the answers to the prior three questions differ for recent completers who earned initial licenses only versus those who earned an initial license with an additional endorsement in Culturally and Linguistically Diverse (CLD) or Special Education Generalist (SPED)?

Throughout this report, we refer to teacher preparation program "completers." Colorado preparation programs do not license teachers; rather, when students seek state licensure, the programs *recommend* students who have completed all the necessary program requirements to be licensed by the state. Some students who complete program requirements do not seek state licensure for a variety of reasons, and this decision is beyond the control of the preparation program. Because of this, we adopt the definition of "completer" employed by DHE: a "completer" is anyone who completed an approved teacher preparation program and was *eligible to be recommended* for initial teacher licensure by the state, whether they were in fact recommended or not. This study examines a specific subset of completers--those who completed their initial teacher licensure program between 2004 and 2010 and were active teachers in Colorado public schools as of December 2010. Further, we also tracked recently prepared teachers who, in addition to their initial license, completed an added endorsement in two high-need areas, CLD and SPED, during this same time frame.

Description of Data Employed in This Study

In Colorado there are 18 unique IHEs where a teacher candidate can follow a traditional teacher preparation path to become certified to teach in a K-12 public school. This report only investigates teachers prepared through traditional teacher preparation programs and excludes alternative preparation routes that may be affiliated with these 18 IHEs. Of these 18 IHEs, 11 offer an additional specialized endorsement as a Special Education Generalist (SPED) and 11 offer an additional endorsement in Culturally and Linguistically Diverse education (CLD).[2] However, during the period examined in this study, only eight IHEs were able to verify completers of SPED and CLD added endorsements and all discussions of endorsement completers in this report pertain to those eight IHEs. Table 1 lists these 18 institutions and their abbreviations for the purposes of this report. The data we analyze here were provided by the DHE and contain human resources (HR) information from the CDE for all Colorado public school teachers employed during the 2010-11 school year, as well as preparation information for all teachers trained at Colorado IHEs between 2004 and 2010. The latter is collected annually by DHE as part of the statewide Student Unit Record Data System (SURDS). We also had SURDS degree completion reports which we referenced when teachers had affiliations with multiple preparation programs.

There were a total of 47,594 unique licensed teachers in the HR data for 2010-11 provided to us by DHE. Of these, 6,704 (14%) teachers were also listed in the SURDS data as enrolled in a teacher preparation program with one of the 18 IHEs in Colorado between 2004 and 2010. The Colorado-prepared subset of all Colorado teachers serves as the focal sample for this report. We exclude from our analysis any Colorado teachers who received their teacher preparation before 2004, received it from an alternative route, or received it in a different state. No preparation information is available for this larger subset of Colorado teachers.

[2] In the past, "Culturally and Linguistically Diverse" has been described simply as "Linguistically Diverse." Eight IHEs offer both special education generalist and culturally and linguistically diverse education added endorsements and six IHEs offer one or the other, but not both.

Table1. Colorado Institutes of Higher Education that Grant Teacher Initial Licensure 2004-2010

Full Institution Name	Abbreviation for this Report
Adams State College	Adams State
Colorado Christian University	Colorado Christian
Colorado College	Colorado College
Colorado Mesa University	Colorado Mesa
Colorado State University	CSU
Colorado State University-Pueblo	CSU Pueblo
Fort Lewis College	Fort Lewis
Jones International University	Jones
Metropolitan State College of Denver	Metro
Regis University	Regis
Rocky Mountain College of Art and Design	Rocky
University of Colorado Boulder	CU Boulder
University of Colorado Colorado Springs	CU Colorado Springs
University of Colorado Denver	CU Denver
University of Denver	DU
University of Northern Colorado	UNC
University of Phoenix	Phoenix
Western State College	Western

Note: Some IHEs maintain essentially separate records for programs that are oriented toward undergraduate and postgraduate students. In this report these programs are not disaggregated in the descriptive statistics that are presented. These are available by request.

Because the SURDS Educator Preparation dataset only reports enrollment and not completion prior to 2011, it is not clear from this data alone which IHE prepared current teachers

for initial licensure and, where applicable, additional SPED or CLD endorsements. To investigate this more carefully, we generated rosters linking teachers with every IHE to which they had any listed affiliation between 2004 and 2010. Representatives from each IHE then verified initial program completers from this list of former program enrollees. Similarly, completers of added endorsements were only attributed to an IHE if they were identified as *both* an initial licensure completer and an added endorsement completer by the program. It is important to point out that this study omits additional endorsements of individuals who completed initial licensure at one IHE and an additional endorsement at another, as well as individuals who received their initial licensure prior to 2004 and only an additional endorsement since. We then used this data file to investigate the research questions previously listed on the sample of practicing teachers who completed their training between 2004 and 2010. The companion report, *Enhancing Colorado Data Systems: Linking Teachers to Preparation Programs*, contains more detailed information about how the sample of Colorado program completers was determined and verified.

Demographic Characteristics of Recently Licensed Teachers

Before presenting the characteristics of the subset of current Colorado public school teachers who received their teacher preparation at a Colorado IHE from 2004-2010, we provide summary statistics for a few key demographic variables associated with the population of practicing teachers in the State of Colorado as a whole. According to the full CDE HR data file from 2010-11, regardless of when and where they were prepared, Colorado teachers are on average 43 years old with 11 years of experience and make an average base salary of $44,000 per year. The Colorado school districts with the largest numbers of students are Jefferson County, Denver County, Cherry Creek, Douglas County, and Adams Five Star Schools.

We underscore a limitation of this report by the variable “available years of data” displayed in the second column of Tables 2a and 2b. As can be seen, the value of this variable for each IHE is never higher than seven and in some cases is lower than seven. Institutions differ in the years of verifiable data due to differences in reporting practices and internal data systems. One institutional reporting practice that limited the study was missing social security numbers in some years. For CDE to link human resources data to SURDS educator preparation program

data, IHEs had to include student social security numbers in their SURDS records. There were several years where some institutions did not provide any student social security numbers to DHE and, therefore, those IHEs had fewer years of data to work with when verifying their completers. While most IHEs did report social security numbers for most years, several IHEs failed to report them for a small percentage (between 1 – 11%) of teacher candidates in particular years. Another challenge was that several IHEs switched institutional data systems between 2004 and 2010 and could only verify completer data available under their newest system. Both scenarios reduced the number of years of verifiable data, particularly the earliest years, making the resulting sample of verified completers younger and less experienced than it would have been had every institutions been able to verify all seven years of SURDS data.

The available data, while imperfect, are sufficient to give us a good sense of the demographics of current teachers who were prepared in Colorado and of various IHE placement patterns. Future studies will have more and better data on which to rely because social security numbers are now required for all SURDS reports and DHE began collecting completer information directly as part of SURDS in 2011. These two changes will dramatically improve the quantity and quality of the completer data going forward.

In addition to the number of years of available data, the two panels of Table 2 display the gender, age at time of program completion, and average base salary for those teachers who completed initial licensure (Table 2a) and those who completed initial licensure *and* an added endorsement in CLD or SPED specializations (Table 2b). Note that the second group (initial license and added endorsement completer) is distinct from the first group (initial license completer). The demographics of initial license completers, shown in Table 2a, vary substantially across programs due to the emphasis on undergraduate or graduate initial licensure programs and institutional mission. Three-quarters of practicing teachers identified as Colorado preparation program completers are female, though there is significant variation from one IHE to another. Nearly 90% of teachers prepared by Colorado Christian and Regis Universities are female whereas the three western slope campuses of Western, Colorado Mesa, and Fort Lewis prepared significantly fewer women (62, 76, and 68% respectively). Nearly 90% of those with added endorsements in SPED or CLD were female with Fort Lewis and Regis serving exclusively women.

Table 2a. Demographics of Teachers with Initial Licenses Only

	N	Years of available data[1]	Gender % Female	Age at time of licensure eligibility	Base Salary [In Thousands]
Adams State	311	7	77%	31 (9)	32 (9)
Colorado Christian	194	6	88%	28 (10)	35 (9)
Colorado College	28	2	64%	28 (6)	35 (5)
Colorado Mesa	429	7	76%	32 (9)	35 (10)
CSU	508	7	68%	25 (5)	32 (10)
CSU Pueblo	319	7	76%	29 (8)	32 (8)
Fort Lewis	130	7	68%	27 (6)	31 (10)
Jones	23	4	78%	39 (8)	38 (13)
Metro	1198	7	75%	31 (8)	35 (11)
Regis	607	7	83%	35 (9)	36 (11)
Rocky	12	6	42%	25 (6)	28 (12)
CU Boulder	582	7	76%	26 (6)	36 (11)
CU Colorado Springs	63	2	76%	30 (9)	36 (5)
CU Denver	523	7	80%	30 (7)	39 (11)
DU	143	7	73%	30 (8)	36 (12)
UNC	739	5	80%	25 (6)	31 (9)
Phoenix	456	7	73%	34 (8)	38 (11)
Western	82	4	62%	30 (10)	29 (11)
All IHEs	6347	7	76%	30 (7)	35 (10)

[1]Number of years the IHE was able to verify completer data

N is the total number of active Colorado public school teachers in December 2010 verified as completing the requirements for initial teacher licensure through a Colorado traditional teacher prep program, 2004-2010.

Table 2b. Demographics of Teachers with Added Endorsements

	N	Years of available data[1]	Gender % Female	Age at time of advanced endorsement eligibility	Base Salary [In Thousands]
Adams State	43	7	81%	40 (10)	38 (10)
CSU Pueblo	7	7	86%	39 (9)	36 (2)
Fort Lewis	16	7	100%	26 (5)	33 (6)
Regis	14	7	100%	36 (9)	40 (7)
CU Boulder	7	7	86%	32 (10)	41 (12)
CU Denver	141	7	87%	32 (7)	42 (12)
UNC	123	5	92%	25 (6)	33 (8)
Western	6	4	83%	25 (4)	27 (12)
All IHEs	357	6	89%	30 (7)	38 (10)

[1]Number of years the IHE was able to verify completer data
N is the total number of active Colorado public school teachers in December 2010 verified as completing both the requirements for initial teacher licensure and an added endorsement in Special Education Generalist or Culturally and Linguistically Diverse, through a Colorado traditional teacher prep program, 2004-2010.

We were able to estimate age at time of licensure eligibility by subtracting year of birth from year of verified teacher prep completion. However, because institutions did not report initial licensure completion via undergraduate and graduate programs separately, the mean age information is influenced by the proportionate sizes of an IHE's undergrad and graduate initial prep programs. Thus, schools that provide the bulk of initial licenses at the undergraduate level (e.g., CU Boulder, UNC) have relatively low average age at time of licensure eligibility, while schools that provide the bulk of initial licenses at the graduate level have higher average age (e.g., Jones, Regis, Phoenix). The average age of added endorsement completers is identical to that of the larger group of initial license completers.

The final column in the panels of Table 2 display the average and standard deviation of base salary among those teachers recently prepared at Colorado IHEs, which is a data element in the CDE HR collection. Given variation across IHEs in the available years of verified completer data, it is important to recognize that the salary data in Table 2 compare teachers with different years of experience. The earliest completer for Colorado College finished in 2009 while

completers from other institutions finished as early as 2004. This is an important consideration given that most school districts have traditionally followed lockstep salary schedules driven by education level and years of service.

There are a couple of notable exceptions to the lockstep salary schedule, however, that may influence our interpretation of the average base salary information (Paone, Whitcomb, Rose & Reichardt, 2008). Denver Public Schools and Douglas County Schools both have significant pay-for-performance compensation systems. Thus, without more research, it is unclear whether base salary numbers reported for teachers working in these two districts are comparable to base salaries from districts with traditional salary schedules. Moreover, the base starting salaries vary widely depending on regional labor markets. Those with added endorsements enjoy a relatively higher average salary reflecting the perpetual shortage of SPED- and CLD-endorsed teachers and the fact that a number of SPED and CLD preparation programs are embedded within master's degree programs, but the standard deviation ($10,000) is the same for both initial licensure and added endorsement completers.

Tables 3a and 3b display the race/ethnicity distribution of teachers by prep program. Mirroring national trends, new teachers prepared in Colorado tend to be predominantly white. CSU Pueblo, Phoenix, Jones, and Adams State have the lowest proportion of white, non-Hispanic completers currently teaching in Colorado public schools. There are few black, non-Hispanic completers in our sample, and though Phoenix, Jones and CSU Pueblo show larger proportions of black completers, the number of black students is quite small. The distribution of IHEs preparing Hispanic teachers is nearly bimodal, with Adams State and CSU Pueblo serving the bulk of this demographic. A similar bimodal pattern appears in Table 3b for new teachers with added endorsements, this time with Adams State and UNC serving a disproportionate percentage of Hispanic and Regis serving a greater number of black pre-service teachers.

Placement Trends of Recently Licensed Teachers

Teacher placement in Colorado school districts is an important outcome associated with teacher preparation programs, an outcome that will vary not only by location of the school district but by the demographic and achievement characteristics of the students in a given school.

Table 3a. Race/Ethnicity of Teachers with Initial Licenses Only (percentages)

	White, non-Hispanic	Hispanic	Black, non-Hispanic	Asian or Pacific Islander	Native American or Alaskan Native
Adams State	73	22	1	0	1
Colorado Christian	89	8	1	0	0
Colorado College	82	11	0	7	0
Colorado Mesa	85	8	0	1	1
CSU	89	4	0	1	1
CSU Pueblo	67	20	3	2	0
Fort Lewis	82	3	1	1	7
Jones	61	0	4	0	0
Metro	81	10	2	2	0
Regis	79	5	1	4	0
Rocky	92	0	0	0	0
CU Boulder	83	8	1	3	1
CU Colorado Springs	89	5	2	2	0
CU Denver	86	5	1	3	0
DU	92	3	1	2	0
UNC	83	9	1	3	1
Phoenix	64	5	3	0	0
Western	94	1	0	0	0
All IHEs	81	8	1	2	1

Sample represents active Colorado public school teachers in December 2010 verified as completing the requirements for initial teacher licensure through a Colorado traditional teacher prep program, 2004-2010.

Table 3b. Race/Ethnicity of Teachers with Initial Licenses and Added Endorsements (percentages)

	White, non-Hispanic	Hispanic	Black, non-Hispanic	Asian or Pacific Islander	Native American or Alaskan Native
Adams State	74	21	2	2	0
CSU Pueblo	86	14	0	0	0
Fort Lewis	100	0	0	0	0
Regis	71	0	14	0	0
CU Boulder	86	14	0	0	0
CU Denver	82	9	1	4	0
UNC	71	25	0	2	1
Western	83	0	0	0	0
All IHEs	78	15	1	3	0

Sample represents active Colorado public school teachers in December 2010 verified as completing the requirements for both initial teacher licensure and an added endorsement in Special Education Generalist or Culturally and Linguistically Diverse, through a Colorado traditional teacher prep program, 2004-2010.

School Districts Employing Recently Prepared Teachers

For many IHEs, completers teach in a concentrated set of school districts. Tables 4 and 5 describe the placement patterns for each IHE. Table 4 indicates, for each IHE, the proportions of completers between 2004 and 2010 that have been placed into the top five feeder school districts in Colorado. Table 5 serves as a key to indicate the identity of these top five districts unique to each IHE. For example, the information in these two tables demonstrates how Metro and UNC, the two IHEs that prepare the largest number of teachers in the state, have very different employment patterns. For example, Table 5 indicates that the top five placement districts for Metro employ 78% of Metro's 1,198 verified initial licensure completers who stay in Colorado. Table 6 indicates that the district attracting the largest proportion of Metro completers is Jefferson County with 23%. In contrast, Table 5 indicates that UNC's 862 verified completers tend to be dispersed across many more school districts. The top five school districts employing UNC completers represent only 36% of the total, and the district employing that largest proportion of these completers is Greeley (where UNC is located) with 11%.

Statewide, it is not surprising that the top five most common placement areas across all IHEs are where demand for new teachers is greatest: the state's largest school districts. Specifically, these top employers are Jefferson County, Denver County, Adams-Arapahoe 28J (Aurora Public Schools), Cherry Creek, and Douglas County. When focusing only on IHEs that placed at least 300 teachers in Colorado schools between 2004 and 2010 (i.e., the top 10 producers of new teachers), the most frequent placement areas are the same, though in a slightly different order, and include Jefferson County, Denver County, Douglas County, Adams-Arapahoe 28J (Aurora Public Schools), and Cherry Creek.

Table 4. Teacher Placement Rates (Percent of Total)

	District 1	District 2	District 3	District 4	District 5	Top 5 Cumulative	N
Adams State	6	5	4	4	4	23	354
Colorado Christian	25	12	5	5	3	50	194
Colorado College	36	21	7	7	7	78	28
Colorado Mesa	57	9	6	4	2	78	429
CSU	19	8	6	6	5	44	508
CSU Pueblo	36	15	9	6	5	71	326
Fort Lewis	20	8	8	7	6	49	146
Jones	22	13	9	4	4	52	23
Metro	23	20	9	8	8	78	1198
Regis	13	8	7	7	6	41	621
Rocky	33	17	17	8	8	83	12
CU Boulder	20	14	12	11	10	67	589
CU Colorado Springs	37	24	10	6	3	80	63
CU Denver	20	15	13	10	8	66	664
DU	27	17	15	11	6	76	143
UNC	11	9	6	5	5	36	862
Phoenix	12	10	7	7	6	42	456
Western	12	11	8	4	4	39	88

Districts 1 to 5 are the five districts in which the most teachers from each IHE are placed.
Placement rates are calculated as the percent of verified completers from an institution placed in a district.
Sample represents the total number of active Colorado public school teachers in December 2010 verified as completing the requirements for initial teacher licensure through a traditional teacher prep program at the listed IHE, 2004-2010.

Table 5. Top 5 Districts where IHE Candidates are Placed

	District 1	District 2	District 3	District 4	District 5
Adams State	Pueblo County Rural 70	Pueblo City 60	Douglas County RE 1	North Conejos RE-1J	Alamosa RE-11J
Colorado Christian	Jefferson County R-1	Mesa County Valley 51	Valley RE-1	St Vrain Valley RE 1J	Thompson R-2J
Colorado College	Academy 20	Colorado Springs 11	Lewis-Palmer 38	Harrison	Fountain 8
Colorado Mesa	Mesa County Valley 51	Montrose County RE1J	Garfield RE-2	Delta County 50 (J)	Roaring Fork RE-1
CSU	Poudre R-1	Jefferson County R-1	Thompson R2-J	Greeley 6	St Vrain Valley RE 1J
CSU Pueblo	Pueblo City 60	Pueblo County 70	Fountain 8	Harrison 2	Canon City RE-1
Fort Lewis	Durango 9-R	Montezuma-CortezRE1	Denver County 1	Bayfield 10 JT-R	Ignacio 11JT
Jones	Douglas County RE 1	Adams-Arapahoe 28J	Fountain 8	Widefield	St. Vrain Valley RE 1J
Metro	Jefferson County R-1	Denver County 1	Adams-Arapahoe 28J	Cherry Creek 5	Adams 12 Five Star
Regis	Jefferson County R-1	Denver County 1	Cherry Creek 5	Douglas County RE 1	Colorado Springs 11
Rocky	Jefferson County R-1	Douglas County RE 1	Adams-Arapahoe 28J	Mapleton 1	Littleton 6
CU Boulder	Boulder Valley RE 2	St Vrain Valley RE 1J	Adams 12 Five Star	Denver County 1	Jefferson County R-1
CU Colorado Springs	Colorado Springs 11	Falcon 49	Harrison 2	Academy 20	Widefield 3
CU Denver	Jefferson County R-1	Denver County 1	Adams-Arapahoe 28J	Adams 12 Five Star	Adams County 14
DU	Denver County 1	Cherry Creek 5	Jefferson County R-1	Douglas County RE 1	Adams 12 Five Star
UNC	Greeley 6	Denver County 1	Jefferson County R-1	Cherry Creek 5	Adams-Arapahoe 28J
Phoenix	Douglas County RE 1	Jefferson County R-1	Adams-Arapahoe 28J	Cherry Creek 5	Denver County 1
Western	Mesa County Valley 51	Gunnison Watershed RE1J	Denver County 1	Roaring Fork RE-1	Douglas County RE 1
All IHEs	Jefferson County R-1	Denver County 1	Adams-Arapahoe 28J	Cherry Creek 5	Douglas County RE 1

Sample represents active Colorado public school teachers in December 2010 verified as completing the requirements for initial teacher licensure through a traditional Colorado teacher prep program, 2004-2010.

Table 6a. Percent of Teachers with Initial Licenses at Top Five Districts where Teachers are Placed

	District 1	District 2	District 3	District 4	District 5	Top 5 Cumulative
Adams State	5	5	5	5	4	24
Colorado Christian	25	12	5	5	3	50
Colorado College	36	21	7	7	7	78
Colorado Mesa	57	9	6	4	2	78
CSU	19	8	6	6	5	44
CSU Pueblo	36	14	9	6	5	70
Fort Lewis	19	8	8	7	7	49
Jones	22	13	9	4	4	52
Metro	23	20	9	8	8	68
Regis	13	8	7	7	6	41
Rocky	33	17	17	8	8	93
CU Boulder	20	14	11	11	10	66
CU Colorado Springs	37	24	10	6	3	80
CU Denver	19	14	13	12	9	67
DU	27	17	15	11	6	76
UNC	12	9	6	4	4	35
Phoenix	12	10	7	7	6	42
Western	12	12	7	5	5	41
All IHEs	12	10	5	5	5	37

Districts 1 to 5 are the five districts in which the most teachers from each IHE are placed as reported in Table 5.
Sample represents active Colorado public school teachers in December 2010 verified as completing the requirements for initial teacher licensure through a traditional Colorado teacher prep program, 2004-2010.

Table 6b. Percent of Teachers with Initial Licenses and Added Endorsements at Top Five Districts where all Teachers are Placed

	District 1	District 2	District 3	District 4	District 5	Top 5 Cumulative
Adams State	16	12	12	9	7	56
CSU Pueblo	43	14	14	14	0	85
Fort Lewis	25	12	6	6	6	55
Regis	21	7	21	0	0	49
CU Boulder	29	29	29	14	0	100
CU Denver	26	18	11	7	5	67
UNC	11	11	9	6	5	42
Western	17	17	17	17	17	85
All IHEs	13	12	7	6	3	41

Districts 1 to 5 are the five districts in which the most teachers from each IHE are placed as reported in Table 5.

Sample represents active Colorado public school teachers in December 2010 verified as completing the requirements for both initial teacher licensure and an added endorsement in Special Education Generalist or Culturally and Linguistically Diverse, through a Colorado traditional teacher prep program, 2004-2010.

Table 6a and 6b report the percentage of each IHE's verified completers employed at the top five districts listed in Table 5. Table 6a focuses on placement patterns for completers with initial licenses only and Table 6b on teachers earning both an initial license and an added endorsement in CLD or SPED. Comparing these two tables reveals that the placement patterns for teachers with added endorsements is not the same as it is for newly prepared teachers. For example, 5% of initial-only endorsements from Adams State teach at Pueblo County Rural, but 16% of Adams State's initial plus added endorsements teach there. The extent of this difference varies across IHEs, however: 15% of completers with initial plus additional endorsements from CSU Pueblo work in districts other than the five listed in Table 5, while 51% of such completers from Regis do so.

An emergent pattern is that half of the IHEs place a majority of their new teachers in a few school districts. Nine IHEs supply 2/3 or more of their new teachers to a concentrated set of five districts, though not necessarily the same five districts. For example, 80% of teachers finishing their licensure program at CU Colorado Springs take teaching positions in Colorado Springs District 11, Falcon, Harrison, Academy, or Widefield school districts. The pattern holds true for those who prepare small and large numbers of new teachers each year, public and private IHEs. Of the nine IHEs with the pattern of producing teachers for a concentrated set of school districts, three are private (33%), which is roughly proportionate to the number of private IHEs in the state (39%).

Geographic Proximity of Employment and IHE Preparation Program

Many of the differences in observed placement patterns across IHEs may be due to differences in population density and district size in the communities surrounding the institutions. Using CDE's assignment of each school district in the state to one of eight official regions, it is possible to analyze the extent to which licensure completers take teaching positions in the region in which they were prepared. The maps in Figures 1-2 display the location of each IHE in relation to each region and its school districts.

IHEs in the Metro Region, magnified in Figure 2, prepare teachers who most commonly take positions in the Metro Region as opposed to teaching in other parts of Colorado. An exception to this is Colorado Christian. However, Colorado Christian has several campuses and

the location of concentrated placements of their completers is aligned with the location of its satellite campuses. For example, Colorado Christian has campuses in Lakewood, Grand Junction, Sterling, Northglenn, and Loveland, and this parallels closely their top five placement districts (Jefferson County, Mesa County /Valley, Valley RE-1, St. Vrain Valley, and Thompson). Another minor exception is Regis, which provides teachers mostly to the Metro Region, but also provides a sizable number of teachers to Colorado Springs 11 in the Pikes Peak Region where Regis has a satellite campus.

While this pattern holds for the Metro Region IHEs, it does not hold for IHEs in other parts of the state. Initial licensure completers from IHEs outside the Metro Region tend to work in a larger number of districts. For example, the top five districts in which Adams State places completers only account for 23% of all their completers. For this reason, we examined the non-Metro Region IHEs placement patterns by region. Adams State supplies teachers to numerous very small districts in the Southeast and Southwest Regions. In fact, Adams State, which is located in the Southwest Region and on the border of the Southeast Region, supplies over 58% of its completers to 27 various districts in those two regions. Most of these districts are extremely small, so no single district accounts for a large percent of completers. If these many small southern districts can be thought of as local to Adams State, then Adams State is also a local supplier of teachers to the southern regions of Colorado.

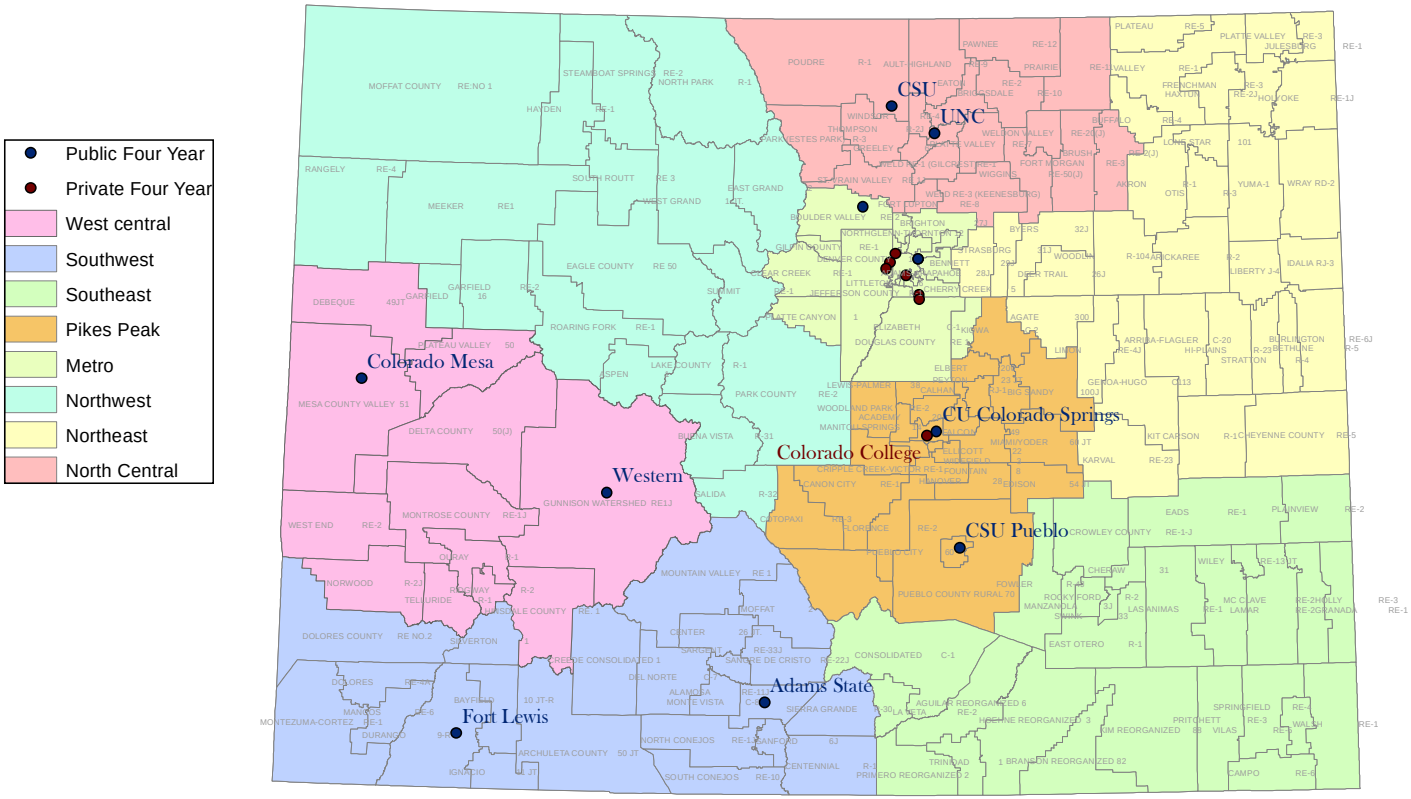
Although UNC is similar to Adams State in terms of the pattern of not supplying teachers to a specific set of districts, UNC's dispersion pattern is very different from that of Adams State. With Adams State, we observed that it, like many of the other IHEs, was a "local supplier," though local meant the numerous small and two medium-sized districts in southern Colorado (Pueblo City 60 and Pueblo County 70). In contrast, as noted previously, UNC's placement pattern is more dispersed. UNC provides approximately 39% of its new teachers to the Metro Region, approximately 35% of its new teachers to the local North Central Region in which the main campus of UNC is located, and the other approximately 26% of teachers are spread throughout the state. One factor contributing to the large percentage of UNC completers working in the Metro Region is UNC's Center for Urban Education, which is located in Denver rather than on the main campus in Greeley.

The placement pattern at Western, another IHE where the top five placement districts account for just over a third (39%) of all completers, displays a pattern similar to UNC's pattern

(though Western does not have a Metro Region campus). About 31% of Western's completers remain in the West Central Region where Western is located, yet the next highest placement region is the Metro Region, where about 23% of verified completers take positions. The remaining approximately 46% take positions elsewhere in the state, with smaller concentrations in the Pikes Peak (15%) and the Northwest (14%) regions.

These results indicate that, in fact, many initial licensure completers teach in the region in which they were prepared, but in some cases are dispersed among a large number of very small districts in that region. As a result of the small size of each district, no one district accounts for very many completers, though a regional perspective accounts for a larger percentage of completers. UNC, one of the state's largest preparers of teachers, is an exception to this pattern, to some extent because of its Metro Region campus. Another possible contributor to this is the reputation of UNC as a "teacher school" for undergraduates wanting to enter the profession. UNC attracts a traditional population of undergraduates who move to campus for schooling and then move elsewhere after graduation to enter the workforce. Except for UNC, all IHEs that offer added endorsements in Culturally and Linguistically Diverse Education and Special Education Generalist send about half of these teachers to their top five districts.

Figure 1: School Districts, Regions, and IHEs



*Note: Figure 2 displays the Public and Private University names for the Metro Region.

Figure 2: Metro Region

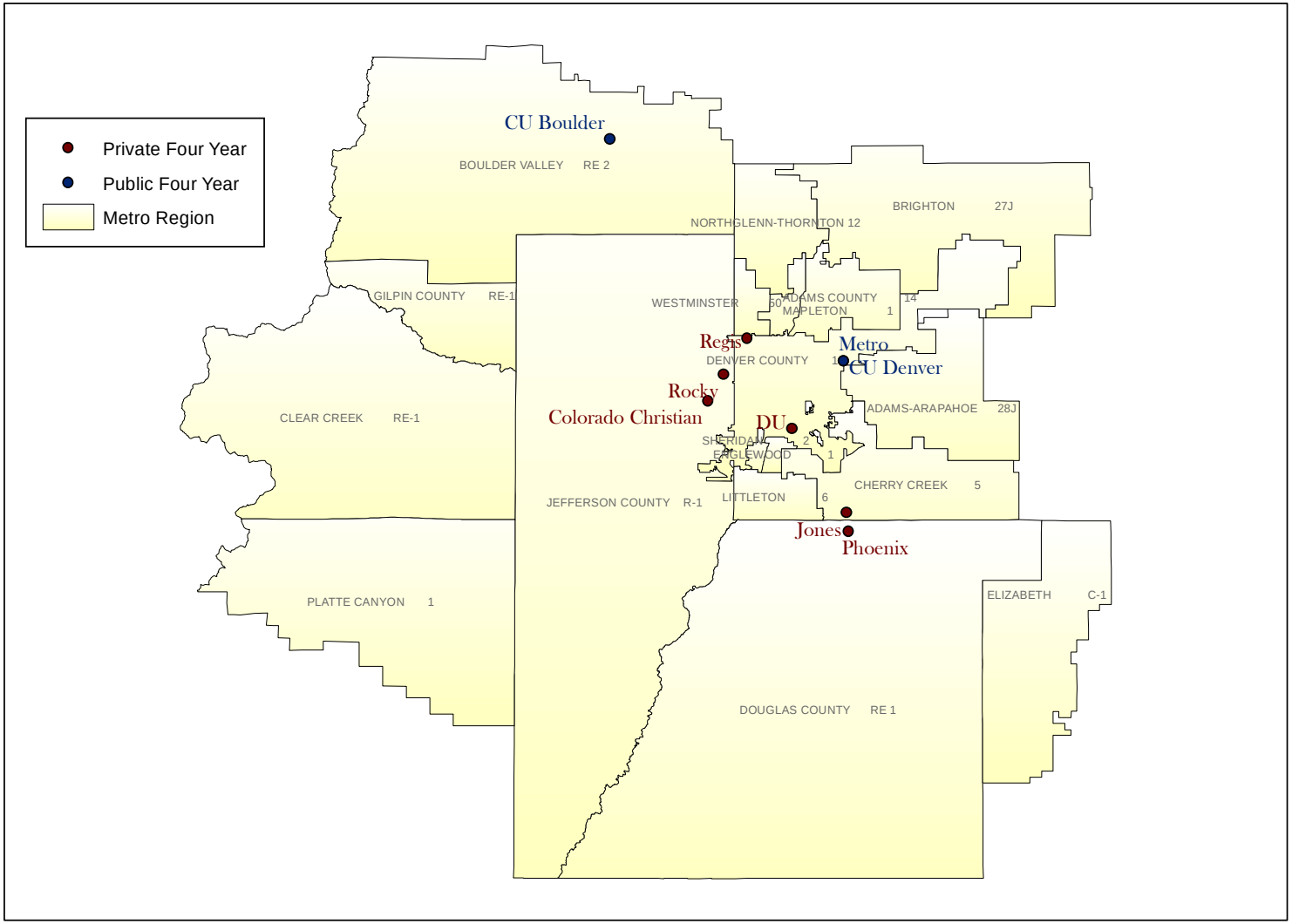


Table 7a. 2010-2011 Student Demographics for Schools in which Recent Completers with Only an Initial License Taught

IHE	N	% White	%Hispanic or Latino	% Black or African American	% Asian	%American Indian/Alaska Native	% Free or Reduced Lunch
Adams State	311	52	42	2	1	1	58
Colorado Christian	194	61	30	3	2	1	46
Colorado College	28	62	20	8	3	1	32
Colorado Mesa	429	66	28	1	1	1	48
CSU	508	62	29	4	2	1	37
CSU Pueblo	319	44	46	5	1	1	61
Fort Lewis	130	59	27	3	2	6	46
Jones	23	57	29	8	2	1	44
Metro	1198	49	37	7	3	1	47
Regis	607	56	31	6	3	1	43
Rocky	12	56	30	6	3	1	43
CU Boulder	582	55	33	4	4	1	39
CU Colorado Springs	63	56	26	8	3	1	40
CU Denver	523	44	44	6	3	1	52
DU	143	49	35	8	4	1	43
UNC	739	52	37	4	2	1	47
Phoenix	456	55	31	6	3	1	40
Western	82	63	29	3	2	1	44
All IHEs	6347	54	35	5	3	1	46
State of Colorado	47594	57	32	5	3	1	42

Sample represents active Colorado public school teachers in December 2010 verified as completing the requirements for initial teacher licensure only through a traditional Colorado teacher prep program, 2004-2010.
Race/ethnicity percents do not sum to 100 because reported categories are not exhaustive.

Table 7b. 2010-2011 Student Demographics for Schools in Which Recent Completers with Added Endorsements Taught

IHE	N	% White	%Hispanic or Latino	% Black or African American	% Asian	%American Indian/ Alaska Native	% Free or Reduced Lunch
Adams State	43	60	31	1	1	5	49
CSU Pueblo	7	57	39	2	<1	1	49
Fort Lewis	16	65	23	2	3	4	40
Regis	14	32	48	11	5	1	65
CU Boulder	7	41	52	1	3	1	53
CU Denver	141	42	44	7	3	1	57
UNC	123	42	47	5	2	1	58
Western	6	65	26	3	1	1	47
All IHEs	357	45	43	5	3	1	56
State of Colorado	47594	57	32	5	3	1	42

Sample represents active Colorado public school teachers in December 2010 verified as completing the requirements for both initial teacher licensure and an added endorsement in Special Education Generalist or Culturally and Linguistically Diverse, through a Colorado traditional teacher prep program, 2004-2010. Race/ethnicity percents do not sum to 100 because reported categories are not exhaustive.

Table 8a. 2010-2011 Achievement Characteristics of Schools Where Recently Prepared Teachers Work by Institution of Higher Education

IHE	N	Median Growth Percentile Math CSAP	% Proficient or Advanced Math CSAP	Median Growth Percentile Reading CSAP	% Proficient or Advanced Reading CSAP	Median Growth Percentile Writing CSAP	% Proficient or Advanced Writing CSAP
Adams State	311	48 (13)	56 (19)	48 (10)	66 (13)	48 (10)	52 (14)
Colorado Christian	194	49 (11)	63 (15)	52 (8)	70 (12)	50 (9)	55 (14)
Colorado College	28	46 (8)	54 (22)	47 (6)	71 (14)	50 (6)	57 (17)
Colorado Mesa	429	53 (12)	54 (18)	51 (8)	66 (12)	51 (9)	49 (13)
CSU	508	50 (10)	48 (20)	49 (8)	67 (16)	50 (8)	54 (17)
CSU Pueblo	319	41 (10)	52 (19)	44 (9)	63 (13)	45 (9)	49 (14)
Fort Lewis	130	50 (9)	52 (22)	49 (9)	65 (17)	49 (8)	49 (18)
Jones	23	48 (8)	55 (22)	49 (8)	66 (17)	50 (7)	52 (17)
Metro	1198	52 (10)	53 (23)	51 (8)	63 (20)	51 (8)	50 (20)
Regis	607	50 (11)	58 (21)	50 (8)	67 (17)	51 (9)	54 (18)
Rocky	12	51 (10)	52 (22)	50 (8)	65 (21)	50 (9)	52 (22)
CU Boulder	582	52 (10)	57 (22)	51 (9)	67 (19)	52 (8)	54 (20)
CU Colorado Springs	63	49 (10)	61 (20)	48 (8)	69 (14)	49 (7)	57 (16)
CU Denver	523	52 (11)	52 (23)	51 (8)	60 (20)	50 (9)	47 (21)
DU	143	52 (11)	53 (24)	51 (9)	65 (21)	52 (9)	52 (22)
UNC	739	50 (10)	56 (20)	49 (8)	65 (17)	50 (8)	52 (17)
Phoenix	456	51 (10)	59 (23)	51 (8)	67 (19)	51 (9)	55 (20)
Western	82	53 (11)	55 (22)	52 (8)	69 (15)	53 (9)	54 (17)
All IHEs	6347	50 (11)	55 (21)	50 (8)	65 (18)	50 (9)	52 (18)
State of Colorado	47594	50 (11)	56(22)	50 (9)	67 (17)	50 (9)	54 (18)

Sample represents active Colorado public school teachers in December 2010 verified as completing the requirements for only initial teacher licensure through a traditional Colorado teacher prep program, 2004-2010. *NOTE: These statistics describe the academic performance of students in schools where recent completers teach. They should not be interpreted as the causal effect of teacher prep programs on student achievement.

Table 8b. 2010-2011 Achievement Characteristics of Schools Where Recently Prepared Teachers *with Added Endorsements* Work by Institution of Higher Education*

IHE	N	Median Growth Percentile Math CSAP	% Proficient or Advanced Math CSAP	Median Growth Percentile Reading CSAP	% Proficient or Advanced Reading CSAP	Median Growth Percentile Writing CSAP	% Proficient or Advanced Writing CSAP
Adams State	43	46 (12)	60 (17)	49 (9)	68 (13)	49 (9)	52 (14)
CSU Pueblo	7	35 (7)	53 (26)	41 (7)	65 (14)	43 (6)	51 (14)
Fort Lewis	16	56 (9)	69 (17)	52 (11)	74 (11)	53 (9)	59 (14)
Regis	14	49 (8)	52 (16)	48 (9)	55 (19)	49 (8)	42 (18)
CU Boulder	7	55 (7)	57 (19)	53 (3)	57 (20)	57 (6)	48 (21)
CU Denver	141	52 (9)	51 (22)	52 (8)	58 (19)	50 (9)	44 (20)
UNC	123	49 (13)	53 (19)	48 (9)	58 (16)	49 (9)	46 (16)
Western	6	55 (9)	57 (16)	51 (5)	70 (9)	54 (9)	53 (15)
All IHEs	357	50 (11)	54 (20)	50 (8)	60 (18)	50 (9)	47 (18)
State of Colorado	47594	50 (11)	56(22)	50 (9)	67 (17)	50 (9)	54 (18)

Sample represents active Colorado public school teachers in December 2010 verified as completing the requirements for both initial teacher licensure and an added endorsement in Special Education Generalist or Culturally and Linguistically Diverse, through a Colorado traditional teacher prep program, 2004-2010.
*NOTE: These statistics describe the academic performance of students in schools where recent completers teach. They should not be interpreted as the causal effect of teacher prep programs on student achievement.

Demographic and Achievement Characteristics of Schools Where Recently Prepared Teachers Work

The two panels in Table 7 provide student demographic characteristics for the schools where teachers from various IHEs work. Differences in the demographics of the K-12 students served by recent completers of Colorado IHEs mirror differences in the demographics of the teachers trained by those IHEs. For example, the western slope IHEs of Colorado Mesa, Fort Lewis, and Western prepare more white teachers than average who are then placed in predominantly white schools. Similarly, Adams State and CSU Pueblo prepare the most Hispanic teachers and staff schools with more Hispanic students than the average. Adams State and CSU Pueblo, along with CU Denver, place teachers in schools where the majority of students are eligible for free or reduced-price lunch (FRL), a measure of socio-economic status. Completers with added endorsements in CLD or SPED tend to be placed in schools that are more heavily Hispanic and low income as evidenced by the increase in the All IHE averages in these categories in Table 7a and 7b (from 35 to 43% for Hispanic and 46 to 56% for FRL).

The uneven distribution of completers from Colorado IHEs by school demographic characteristics is also evident in the school-level achievement data in Table 8, which includes median student growth percentiles and the percentage of students classified as proficient or advanced on the basis of their test performances in math, reading, and writing. Table 8a contains average student proficiency levels and median student growth percentiles at Colorado public schools employing recent completers. Status based achievement statistics such as the percent of students classified as proficient or advanced will be strongly associated with a school's demographic characteristics; median student growth percentiles also have some association with demographic characteristics, but the association tends to be much weaker because growth statistics take into account each student's prior test score history. For example, Colorado College places their completers in schools with substantially white student populations with low rates of FRL eligibility. Not surprisingly, students in these schools have above-average percent proficient or advanced classifications based on their test performance. However, the median student growth percentiles are quite close to the state average (50). In contrast, CSU Pueblo sends teachers to schools with the largest Hispanic population and highest FRL rates; the students at these schools have below average percent proficient or advanced classifications in math, reading, and writing.

Of greater concern, in Pueblo City 60, where the largest number of CSU Pueblo completers are placed, the median student growth percentiles are lower than the state average. Interestingly, CU Denver also tends to place completers in schools with below average percentages of students classified as proficient or advanced on the basis of test performance, but these schools tend to have median student growth percentiles close to the state average.

As mentioned above, recent completers with CLD or SPED added endorsements generally find themselves in higher-need schools, but the achievement characteristics of these schools vary widely. For example, completers with added endorsements from Adams State, CSU Pueblo, and Fort Lewis, on average, find themselves in schools with higher proficiency levels than completers from the same IHE with only an initial endorsement. Completers with added endorsements from Regis, CU Boulder, and UNC found themselves, on average, in high need schools with lower than average achievement characteristics.

Metro Region IHEs

As previously discussed, completers from Metro Region IHEs typically teach in the Metro Region, so the demographic and achievement characteristics of students taught by completers from Metro Region IHEs can be discussed together. Using a weighted average based on the number of completers from each Metro Region IHE, schools in which completers work contain about half (49%) minority students with a range of 37 to 58%. Hispanic students make up the largest minority group for each IHE. These schools contain just over 1/3 (36%) Hispanic students, with a range of 29 to 45%. Slightly under half (45%) of the students in completers' schools are FRL eligible, with a range of 39 to 53%.

Turning to performance on Colorado large-scale assessments, completers from Metro Region IHEs teach in schools where, on average, students perform at about the state average in math and slightly below the state average in reading and writing. In math, students in these completers' schools are at the state average with respect to proficient or advanced classifications (56%). This ranges from 47 to 63%, with most IHEs falling within 3 percentage points of the mean. In reading, on average about 2/3 (65%) of students were classified as proficient or advanced, which is two percentage points lower than the state. The averages for each individual IHE range from 58 to 72%, with most falling within two percentage points of the mean. In writing, about half (51%) of students were classified as proficient or advanced, which is three

percentage points lower than the state. The averages for each individual IHE range from 46 to 59%, again, with most IHEs falling within a few percentage points of the mean.

IHEs Outside the Metro Region

As discussed above, IHEs outside the Metro Region produce teachers who work throughout Colorado. The average demographic and achievement characteristics of the students these teachers teach are virtually the same as the average characteristics described for completers from Metro Region IHEs. IHEs outside the Metro Region produce teachers who teach in schools with 44% minority students (where Hispanic comprise the largest subgroup with 35%) and 48% poor students. These schools are slightly below the state percentages in terms of math achievement (53%), reading achievement (65%), and writing achievement (51%).

Summary

In general, teachers in Colorado public schools who were prepared at Colorado IHEs are predominantly White, non-Hispanic females who complete their initial teacher preparation around age 30, and their current average base salary was approximately $35,000. Schools that provide the bulk of initial licenses at the undergraduate level have relatively low average age at time of licensure eligibility, while schools that provide the bulk of initial licenses at the graduate level have higher average age. The average age of added license completers is identical to that of the larger group of initial license completers. Those with added endorsements enjoy a relatively higher average salary reflecting the perpetual shortage of SPED- and CLD-endorsed teachers and the fact that a number of SPED and CLD preparation programs are embedded within master's degree programs.

Placement patterns for many IHEs reveal that completers teach in a concentrated set of school districts, though this is not true for all IHEs. In fact, half of Colorado's IHEs supply over 2/3 of their new teachers to a concentrated set of five districts (though not the same districts for each IHE). Viewing placements through the lens of Colorado's eight regions explains dispersion patterns for most IHEs. IHEs in the Metro Region produce teachers who work most commonly in the Metro Region and IHEs in rural areas of the state most commonly supply teachers to the numerous small districts in and near the outlying region in which the IHE is located. However,

the rural IHEs also produce teachers working in the Metro Region, presumably an effect of the more active job market there. Overall, most initial licensure completers teach in the region in which they were prepared, but in some cases are dispersed among a large number of very small districts in that region. In rural areas of the state this heavily influences the demographic characteristics and achievement levels of the students they teach. In the Metro Region, completers have more latitude for choice, though job market constraints exist.

Recommendations

The data and analytic strategies presented in this report hold potential for informing program improvement at Colorado IHE-based teacher preparation programs. Completer demographic characteristics and placement patterns have potential implications for course curriculum and program design, recruitment, and achieving an IHE's institutional mission. Close examination of institutional dispersion patterns has implications for how programs organize their curriculum. For example, the curriculum and achievement benchmarks in the districts where the IHE's completers are most likely to teach can be useful preparation materials in pre-service programs. Also, the high-placement districts' teacher evaluation tools should play an important role in the IHE's preparation program as districts implement Colorado's new educator effectiveness system under SB 10-191. Institutional placement patterns that indicate completers teach near their preparation program and near their home towns also suggest that IHEs recruit teacher candidates from high-need areas near the IHE, anticipating that they return to those communities to teach.

Given that newly prepared teachers have a choice in where they apply to work, IHEs may be interested in analyzing whether program completers choose schools where student demographics are aligned with the prep program's stated mission and goals. For example, CU Denver has an explicit mission related to social justice in teacher candidate preparation. For CU Denver, then, the choices that completers make about which populations to work with are extremely important to whether or not the IHE is fulfilling its mission. Analyzing the relationships between IHE mission and placement is beyond the scope of the current report but it is important to point out that the available data could be meaningfully applied by each IHE as evidence related to their missions.

This report also has implications for those interested in outcomes-based evaluations of teacher preparation programs. From an evaluation design perspective, the ideal setting for evaluating the efficacy of a state's teacher preparation programs would be for teacher candidates to be randomly assigned to programs and, upon completion of training, randomly assigned to the schools where they work. As elsewhere in the country, Colorado is far from that ideal evaluation setting and has a strong regional relationship between where teacher candidates are prepared and where they eventually work (Boyd, Lankford, Loeb, and Wyckoff, 2005; Reininger, 2012). This leads some preparation programs to operate in a relatively closed system where candidates enter the IHE from the nearby community and return to that community to work in local schools.

Given the need for strong teachers in all schools, particularly struggling schools, it is critical that any outcomes-based evaluation of teacher preparation programs avoid penalizing a program for sending students into challenging settings. Student achievement characteristics of schools employing recent completers are strongly influenced by prior achievement, but newly-hired completers cannot affect prior achievement; they can only affect subsequent student growth. Moreover, the extent to which new teachers can influence growth can be constrained by contextual factors in the district, including the extent of teacher autonomy in making content delivery decisions and the quality of building leadership. It is also critically important that any teacher preparation program evaluation take into account contextual factors that prevail among the primary districts where an IHE's completers are placed. Teasing out the impact of a preparation program on a teacher's efficacy becomes extremely difficult in complex school settings, and any methodology employed to evaluate teacher preparation programs based on outcomes should take these contextual factors into account.

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