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Retention and Student Outcomes of APPEL-SpEd and Traditional Special Education Licensing Pathways in Utah, 2024-2025 Cohort

Prepared for the Utah State Board of Education and Dr. Leah Voorhies, Deputy Superintendent for Student Achievement

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Executive Summary

In this report, the Utah Education Policy Center (UEPC) presents findings from the second phase of a longitudinal four-year (2024-2027) research practice partnership with the Utah State Board of Education on the Alternate Pathway to Professional Educator License – Special Education (APPEL-SpEd) program in Utah. The overarching study explores how teacher outcomes (i.e., perceived quality of preparation program, supervisor evaluations) and student outcomes differ between teachers in the APPEL-SpEd and traditional SpEd preparation programs. This phase of the longitudinal study examined two outcomes for the 2024-25 cohort of newly licensed special education teachers:

1. one-year retention into the 2025-26 school year, and
2. end-of-year student performance on statewide standardized assessments from the 2024-25 school year, comparing the students of teachers who earned their license through the APPEL-SpEd pathway to the students of teachers who earned it through traditional university-based programs.

Key Findings

Teacher Retention

Retention rates for the 2024-25 APPEL-SpEd cohort (n = 34) were high and comparable to those of the Traditional pathway cohort (n = 112). In 2025-26, 100% of APPEL-SpEd teachers were retained as educators, 97% continued in teaching roles, and 94% remained in special education specifically. Comparable rates for the Traditional pathway were 95%, 93%, and 94%. None of the differences between pathways were statistically significant.

Student Outcomes

Students of APPEL-SpEd teachers showed no statistically significant differences in end-of-year standardized test score gains compared to students of Traditional pathway teachers across Language, Math, and Science assessments (RISE grades 3-8; Utah Aspire Plus grades 9-10). Confidence intervals for the pathway difference were wide, reflecting the modest sample size, and spanned zero for all three subjects. The current data do not permit a conclusion that either pathway produces meaningfully better outcomes for students.

Discussion and Considerations

The report also identifies two important data quality issues with implications beyond this study. First, teachers with CACTUS assignments in preschool and elementary special education roles were substantially underrepresented in student course records (55% match rate vs. 89% for other roles), limiting the ability to link those educators to student outcomes. Second, five teachers who appeared in student course records had no CACTUS assignment for 2025-26, suggesting that relying solely on CACTUS assignment data may undercount retained teachers. Addressing these gaps in administrative data linkage is recommended to strengthen future studies.

Implications

Taken together with the findings from our previous report, which found no meaningful differences between pathways in perceived preparation quality, mentoring quality, or supervisor-rated effectiveness, this study continues to indicate that APPEL-SpEd teachers perform comparably to traditionally trained peers across multiple dimensions of teacher quality. As APPEL-SpEd enrollment

grows and as additional cohorts complete the program, continued longitudinal monitoring will be important for detecting any meaningful differences that the current sample is too small to identify with precision.

Introduction

The Utah Education Policy Center is engaged in a longitudinal (2024-2027) research practice partnership with the Utah State Board of Education on the Alternate Pathway to Professional Educator License – Special Education (APPEL-SpEd) program in Utah. The overarching study explores how teacher outcomes (i.e., perceived quality of preparation program, supervisor evaluations) and student outcomes differ for individuals in the APPEL-SpEd route to licensure and those who complete the special education route in traditional preparation programs. This phase of the longitudinal study examines whether teacher retention rates and student performance on standardized assessments vary by preparation pathway.

Shortages remain a defining feature of the educator workforce. The education workforce continues to experience large attrition, especially for teachers in special education (Gilmour et al., 2025; Kaler et al., 2026). Nationally, special education was reported as the number one shortage area in 45 states in 2024-2025 (Learning Policy Institute, 2025). Attrition not only complicates staffing but also negatively impacts student achievement (Hanushek et al., 2016; Sorensen & Ladd, 2020). As demand for licensed educators in special education in Utah and nationally has remained consistently strong, the landscape of who prepares candidates has shifted. Historically, most educators received their teaching credentials through university-based preparation programs. However, alternative pathways, particularly programs that do not involve institutions of higher education (IHE), have increased significantly (King & Yin, 2022).

Alternative routes to licensure (ARLs) are designed for individuals seeking licensure who may not be enrolled as degree-seeking students or who already hold a degree in another field, though some ARLs are university-based programs. ARLs have existed for decades and are often implemented through partnerships among local education agencies (LEAs), state education agencies, and/or institutions of higher education (IHE), resulting in increased access and varied program structures and delivery models. They were originally intended to expand access to teaching and address persistent shortages in high-need fields, such as STEM (science, technology, engineering, and math) and special education (Myers et al., 2020).

Among the ways ARL programs help meet the educator shortages is by recruiting from populations that have historically had limited representation in or access to traditional preparation routes, thereby contributing to greater diversity within the teaching profession (Connelly et al., 2014; King & Yin, 2022). While concerns have been raised about whether alternative routes provide adequate preparation (Diamond et al., 2022), research drawing on standardized student test scores generally finds that differences in student outcomes between teachers from alternative versus traditional university pathways are minimal and inconsistent (Kane et al., 2008; Rosenberg & Sindelar, 2005; von Hippel et al., 2016).

Utah's educator preparation system reflects the national landscape. The state currently has 10 university-based preparation programs and 50 approved Alternative Pathway to Professional Educator License (APPEL) programs, including those administered by local education agencies (LEA) and one—APPEL-

SpEd—at the Utah State Board of Education (USBE, 2025).[1] Since 2022-2023, enrollments in APPEL programs in Utah have surpassed the number of candidates enrolled in the state's IHEs.[2]

Utah's APPEL-SpEd program was designed to fulfill the requirements for a Utah Professional Educator License with a concentration in Special Education or Preschool Special Education.[3] The pathway begins with candidates completing the requirements for the SpEd Associate Educator License (AEL), which is valid for three teaching years. During this period, candidates may serve as a Special Education teacher of record and must fulfill all remaining requirements for a Professional Educator License in Special Education before the AEL expires.[4] Entry into the SpEd AEL program requires a bachelor's degree, a criminal background review, an Educator Ethics Review, and either a Special Education teaching assignment or a paraprofessional role in a Special Education setting.

Candidates may demonstrate competency through several means, including passing Praxis examinations aligned with their concentration area (preschool, mild/moderate, or severe). They must also complete a Professional Licensing Plan (PLP) developed by the USBE APPEL-SpEd team, which encompasses online AEL learning modules, coursework through both USBE and partner universities, clinical experiences and mentoring provided through their Local Education Agency (LEA), and a cumulative pedagogical performance assessment (PPA). Successful completion of the program results in a recommendation for a Professional Educator License in Special Education. APPEL-SpEd is described as "a good option for individuals who already have a Professional Educator License in another license area and only need a few courses to complete the Special Education license area of concentration requirements, however, it is available to anyone who meets the program's criteria."[5]

Similar to the national landscape, special education consistently ranks among the most in-demand areas for qualified educators in Utah.[6] Enrollment in APPEL-SpEd has grown rapidly since it was introduced in the 2021-22 school year. In 2024-2025, 607 individuals were enrolled in the APPEL-SpEd pathway, compared to 806 individuals enrolled in traditional degree SpEd programs.[7] That same year, 104 individuals in the APPEL-SpEd pathway completed their license requirements, compared to 522 individuals who completed their SpEd licensure requirements from traditional degree SpEd programs.[8]

Previous UEPC Research

In the UEPC's previous report, "Teacher and Supervisor Perceptions of Alternative and Traditional

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[1] The APPEL initiative replaced the existing Alternative Pathway to Teaching and Alternative Route to Licensure program (R277-511) that was sunsetted on 6/30/2020.
[2] See 2023, 2024, and 2025 USBE Educator Preparation Annual Reports https://schools.utah.gov/licensing/reports.

[3] "Alternate Pathway to Professional Educator License (APPEL)", retrieved from https://www.schools.utah.gov/licensing/appel on 3/10/2023.
[4] "USBE APPEL-SpEd Program", retrieved from https://usbe.instructure.com/courses/1301/ on 3/10/2023.
[5] "LEA Guidebook for APPEL-SpEd", retrieved from https://usbe.instructure.com/courses/1301/files/223124 on 3/10/2023.
[6] See USBE's annual reports on educator licensing, educator preparation and criticality index, https://schools.utah.gov/licensing/reports.
[7] From Table 3 of the 2025 Utah Education Preparation Program (EPP) Annual Report.
[8] From Table 7 of the 2025 Utah Education Preparation Program (EPP) Annual Report.

Special Education Licensing Pathways in Utah, 2024-25 School Year," we studied a sample of 146 teachers who received a professional license in special education or preschool special education between May 3, 2023, and December 26, 2024, and who were also teaching in a Utah public school during the 2024-2025 school year. Thirty-four of those teachers received their license through the APPEL-SpEd pathway and 112 through the traditional university-based pathway. Based on survey responses from 20 of the 34 APPEL-SpEd licensed teachers and 48 of the 112 traditional pathway licensed teachers as well as a sample of their supervisors, we found virtually no differences between the pathways in terms of perceived quality of preparation, perceived quality of mentoring experiences, or supervisor assessments of teaching effectiveness. The single significant difference in the initial study was that APPEL-SpEd teachers reported significantly stronger agreement that "being a teacher is an important part of my identity."

Research Questions

The current study builds on our previous studies reported in 2025 by examining two outcomes that were not available at the time of our earlier report: teacher retention into the 2025-26 school year and end-of-year student performance on statewide standardized assessments. Our research questions are:

1. Does teacher retention differ by licensing pathway (APPEL-SpEd compared to traditional special education university-based pathways)?
2. Does student performance on statewide standardized assessments differ by teacher pathway (APPEL SpEd compared to traditional special education university-based pathways)?

Methods & Results

Retention

Methods

Retention of the 2024-2025 cohort of educators was examined by searching the Comprehensive Administration of Credentials for Teachers in Utah Schools (CACTUS) "assignment" table, which lists the start date, "core code" (an 11-digit code describing a teacher's role, such as "8th Grade History"), person ID, and assignment percentage of all licensed educators in public schools in Utah.[9] This table was searched for the person IDs present in the original sample of 146 newly licensed special education teachers who are described above in the "Previous Research" section. If a match with a start date after June 1st, 2025 could be found in the CACTUS assignment table, the teacher was marked as being an "educator," which could include not only teaching but also support and administrative roles. Matches were further classified according to their core codes into the following roles: 1) "teaching": core code with the first two numbers between 02 and 10, 15, 22, 23, or between 30 and 40. 2) "special education": core code either beginning with "23" or having "23" in the 7th and 8th positions of the 11-digit code.

Results

The one-year retention rates for the 2024-25 APPEL-SpEd and Traditional-SpEd cohorts as Educators, Teachers, and Special Education Educators are presented in Table 1.

Table 1. Retention Rates of 2024-25 Newly Licensed Special Educators by Pathway

Pathway	2024-25 Cohort	Educator	2025-26 Teacher	Special Education
APPEL	34	34 (100%)	33 (97%)	32 (94%)
Traditional	112	106 (95%)	104 (93%)	105 (94%)

Although the retention rate of the APPEL-SpEd cohort is slightly higher than the retention rate from the Traditional SpEd cohort for the Educator and Teacher categories, none of the differences between APPEL and Traditional pathways were statistically significant at $p < .05$. **Thus, the answer to Research Question #1 is: No: Teacher retention does not differ by pathway.**

The one member of the 2024-25 APPEL cohort who was not classified as a teacher in 2025-26 had a core code whose label was "school-level specialist: SPED", with a description of "Licensed educators who provide specialized support for students and teachers (i.e. Reading Specialists, Math Specialists) assigned to a school setting. Educators in this category can serve multiple schools, but have a high frequency of interaction with students. Mostly works with Special Education students".[10] Although this role would usually be classified as "support" based on its core code prefix, a case could be made for it to be classified

[9] The Utah Education Policy Center has a Master Data Sharing Agreement (MDSA) with the Utah State Board of Education for use of education data for evaluation and research purposes. The UEPC adheres to the terms of the MDSA, including terms of use, confidentiality, non-disclosure, data security, monitoring, and applicable state and federal laws and regulations. The UEPC also adheres to University of Utah Institutional Review Board provisions and FERPA regulations to protect student privacy and does not report any personally identifiable information.

[10] This definition is from the USBE CACTUS "core code" table, which lists unique core codes, short labels, and descriptions.

as “teacher” based on the description. The two members of the 2024-25 APPEL-SpEd cohort who were not classified as working in special education in 2025-26 had core codes indicating that they were teaching in Kindergarten or Grade 3, but not in a Special Education capacity.

In the Traditional pathway, the number of people working in special education (105) is greater than the number of people teaching (104), which may seem surprising. However, the person who was working in special education but not teaching had the same label as the member of the APPEL-SpEd cohort who was not teaching. That label was “school-level specialist: SPED,” which is classified as a support role but which has a description that could be considered “teaching.”

Student Outcomes

Methods

Matching teachers to students. Students were linked to teachers using a teacher identifier field in the records of student courses, which lists one row per student per course per school year. Not all teachers in the APPEL-SpEd cohort could be matched to students. In the APPEL-SpEd *pathway*, only 25 of 34 (74%) were listed in student course records. In the *Traditional pathway*, only 76 of 112 (68%) were listed in student course records.

An important factor related to whether an educator was listed in student course records is whether that educator’s CACTUS assignment is related to special education delivered to preschool and elementary grade levels. Only 55% of educators with such assignments appeared in student course records, compared to 89% of educators whose CACTUS assignments did not indicate preschool or elementary special education roles. This difference represents an important blind spot in our ability to link educators to students for the purpose of evaluating educators based on student performance. Any studies that use student data to evaluate teachers in preschool and elementary special education roles will be based on only 55% of those educators. This blind spot may present problems for future audits of teaching assignments that assume a more complete record of linking teachers to students. Although the current field for teacher identifier lists only one person ID value, a new field could be added to the student course table that accepts one or more additional person IDs.

Students of “non-teachers.” In the process of searching student courses for the teacher identifiers of our 2024-25 cohort, we found identifiers for five teachers who had no CACTUS assignment for 2024-25. These five teachers are all from the Traditional university-based pathway and represent 5 of the 6 teachers in Table 1 who were missing from the Educator column in 2025-26. Table 2 describes the five teachers who appear in the student courses table but have no CACTUS assignment for 2025-26. The columns describe the number of unique students associated with the teacher, the grade levels of those students, and the descriptions of the core codes associated with the student courses.

Table 2. Teachers with Students but No CACTUS Assignment

Teacher	Unique Students	Grades	Course Core Code Descriptions
A	53	7, 8	Language Arts 7 – SPED, Secondary Reading – SPED (6-8), Student Aide/Assistant
B	24	Pre-K	Preschool SPED
C	1	5	Grade 5 – SPED
D	2	4, 5	Grade 5 – SPED

E	3	Pre-K	Preschool SPED

Although this is a small number of teachers, they represent 5 out of the 6 teachers (83%) who were considered not to have been retained. Their appearance in student records raises concerns about the validity of estimates of teacher retention that rely exclusively on CACTUS assignment records.

Test Scores. Students who could be matched to teachers using student course records were matched to the table of end-of-year standardized assessments on the RISE (Math, Reading, and Science in grades 3-8), Utah Aspire Plus (Math, Reading, and Science in grades 9 and 10), and Acadience Reading (Reading only in Kindergarten through 6th grade) assessments. To control for students' baseline levels of performance, we gathered not only the students' scores for the end of the 2024-25 school year but also their scores from the previous (2023-24) school year. The number of teachers with data from 0 students, 1-9 students, 10-19 students, and 20 or more students is presented in Table 3.

Table 3. Number of Teachers with Test Score Data from Students

		Number of Student Scores for 2024 and 2025			
Pathway	Assessment	0 students	1-9 students	10-19 students	20+ students
APPEL-SpEd (N=25)	RISE - Language	10	3	6	6
	RISE – Math	10	3	7	5
	RISE – Science	10	3	8	4
	Acadience Reading	22	1	1	1
Traditional (N=78)	RISE - Language	30	17	8	23
	RISE – Math	31	17	7	23
	RISE – Science	33	16	7	22
	Acadience Reading	59	16	3	0

Note. The values in the table indicate the number of teachers who have valid test score data from students, organized into four groups representing the number of students from whom data are available.

To illustrate how to interpret Table 3, consider the first row. That row shows that among the 25 teachers from the APPEL-SpEd pathway who could be linked to students, 10 teachers had no students with valid test score data. Three teachers could be linked to only a small group of students (fewer than 10). Six teachers had data from 10-19 students, and six teachers had data from over 20 students. The data in Table 3 indicate that it will be difficult to obtain reliable estimates for the difference in test scores between the students of teachers from APPEL-SpEd and Traditional pathways.

Acadience Reading. As the rows in Table 3 for Acadience Reading illustrate, Acadience Reading scores were available for very few teachers with a reasonable number of students with test scores. This is probably due to the problem documented above in the "Matching Teachers to Students" section: teachers with CACTUS assignments related to special education in elementary grade levels were much less likely to appear in students' course records. Because Acadience Reading is only administered to students in Kindergarten through sixth grade, this measure was disproportionately impacted by this limitation. As a result of poor data for this outcome, our analysis will focus only on students' performance on the RISE and

Utah Aspire Plus tests, which are the standardized assessments of Language, Math, and Science administered to students in grades 3-8 and 9-10, respectively.

Multilevel linear model. To test whether the students of teachers from the APPEL-SpEd pathway performed differently from students of teachers from the Traditional pathway, we fit a statistical model that predicted test scores from the end of 2025 (standardized so they had a mean of 0 and a standard deviation of 1) from predictors that included pathway (APPEL-SpEd or Traditional), test scores from the end of 2024 (to measure learning gains from the previous year rather than the mean level of test scores in the current year; these were also standardized so they had a mean of 0 and a standard deviation of 1), student-level covariates (grade level, special education disability label, eligibility for free or reduced-price lunch, multilingual learner status, and race and ethnicity), and school-level covariates (the percentage of students receiving special education services, chronically absent, eligible for free or reduced-price lunch, and White). These covariates were used to correct for possible differences between the students of APPEL-SpEd and Traditional pathway teachers, permitting a more "apples-to-apples" comparison between the teacher groups. Because the data for this study consist of individual student test scores that are nested within teacher, we used a multilevel model that included a random effect for teacher. This random effect accounts for the clustering of performance results that often occurs within students of the same teacher.

Selecting and recoding predictor variables. Preliminary analysis indicated that none of the school-level covariates nor the student-level race/ethnicity variables were significantly related to 2025 test scores after 2024 test scores were accounted for, so school-level covariates and student race and ethnicity were omitted from the final models. Preliminary analysis also indicated that several disability labels were associated with lower test scores but were also rare, occurring in fewer than 10 students in this sample. Alone, each of these low-frequency disability labels would be too weak to contribute meaningfully to the model. In addition, the Developmental Disability label was confounded with grade level (because it can only be assigned to students under age 9). To address the rare and grade-level-confounded disability labels, we created a new disability label variable that was 1 if a student had a disability label of Developmental Disability, Intellectual Disability, Multiple Disabilities, or Deaf-blindness. Four additional disability labels were found in at least 100 students in the sample and were also related to test scores: Autism Spectrum Disorder, Speech-Language Disability, Other Health Disability, and Specific Learning Disability. Each of these were retained as separate covariates.

Results

The results of the multilevel linear model are presented in Table 4. The bottom row of that table lists the number of student test scores available to analyze the relationship between teacher pathway and gains in test scores: 1,448 for Language, 1,405 for Math, and 1,411 for Science. The values in Table 4 are the regression coefficients, which indicate the change in 2025 standardized test scores when a given predictor variable increases by one unit and all the other variables in the model are held constant at zero. The central question is the estimated effect of preparation pathway (APPEL SpEd compared to Traditional) on students' 2025 test scores, after controlling for 2024 test scores and student covariates. This value is presented in the first row of Table 4. For Language Arts, the value of -0.063 indicates that students of APPEL pathway teachers scored 0.063 standard deviations higher than the students of Traditional pathway teachers, but this difference was not statistically significant at $p < .05$. Similar differences were observed for Math and Science scores. Not surprisingly, the strongest predictor of 2025 test scores was 2024 test scores. This is indicated in the second row of Table 4.

Table 4. Results of Multilevel Linear Model

Predictor	Language Arts	Math	Science
Pathway	-0.063	-0.046	0.025
Test score from 2024	0.645***	0.702***	0.477***
Grade level	0.028*	0.036*	0.065***
Intellectual Disability / Developmental Disability / Multiple Disabilities / Deafblindness	-0.015	-0.016	-0.081
Autism Spectrum Disorder	-0.066	-0.116	-0.052
Speech-Language Disability	-0.011	-0.041	-0.074
Other Health Impairment	-0.094	-0.198***	-0.116
Specific Learning Disability	-0.140***	-0.190***	-0.164***
Eligibility for free or reduced-price lunch	0.005	-0.101**	-0.079*
Multi-lingual learner status	-0.097*	-0.102*	-0.160**
N	1,448	1,405	1,411

Note. ***$p < .001$, ** $p < .01$, *$p < .05$.

The results of the multilevel model indicate that the differences between the students of APPEL-SpEd and Traditional pathway teachers (indicated in the first row of Table 4) are small and not significantly different from 0 at $p < .05$. **Thus, to answer Research Question 2, student performance on statewide standardized assessments does not differ by teacher pathway (APPEL-SpEd compared to traditional special education university-based pathways).**

To provide a more precise estimate of the precision in our estimates of these differences, Table 5 reports the 95% confidence interval for the difference between APPEL-SpEd and Traditional pathway teachers with all covariates set to their mean levels to represent the average student in this sample. If this study were repeated many times, the 95% confidence interval estimates that the true difference between APPEL and Traditional pathway teachers would be within this interval 95% of the time. In this case, that means that there is no meaningful difference in student achievement between the teachers in the two pathways.

Table 5. Confidence Interval of the APPEL - Traditional Pathway Difference

	Language Arts	Math	Science
APPEL-SpEd – Traditional	(-.055, 0.180)	(-0.092, 0.184)	(-0.164, 0.113)

The confidence interval values in Table 5 indicate that the true difference between APPEL-SpEd and Traditional pathway teachers is probably:

- For Language Arts: somewhere between 0.06 standard deviations in favor of the Traditional pathway to 0.18 standard deviations in favor of the APPEL-SpEd pathway.
- For Math: somewhere between 0.09 standard deviations in favor of the Traditional pathway to 0.18 standard deviations in favor of the APPEL-SpEd pathway.
- For Science: somewhere between 0.16 standard deviations in favor of the Traditional pathway to 0.11 standard deviations in favor of the APPEL-SpEd pathway.

Two important conclusions follow from these confidence intervals:

1. For none of the subject areas was the confidence interval consistently on one side of zero. When the confidence interval includes zero (which it does in all three cases), the best conclusion is that no clear difference could be identified.
2. The confidence intervals are fairly wide, being 0.2 to 0.3 standard deviations in length. This suggests that with the current small sample of teachers, there is a great deal of uncertainty in the estimate for the difference between pathways. As more teachers complete the APPEL-SpEd program in subsequent years, the confidence intervals will narrow, reflecting greater precision in our estimates of the difference.

Discussion and Recommendations

The findings from this study are consistent with a growing body of research suggesting that alternative and traditional licensure pathways produce teachers of comparable effectiveness (Kane et al., 2008; Rosenberg & Sindelar, 2005; von Hippel et al., 2016). APPEL-SpEd teachers in Utah showed retention rates equivalent to those of traditionally licensed peers, and their students demonstrated no significant differences in academic growth. These results extend the findings from our previous phase of this research, which found no meaningful differences in perceived preparation quality, mentoring quality, or supervisor-rated teaching effectiveness. Across two phases of this study and multiple dimensions of teacher quality, APPEL-SpEd and Traditional pathway teachers have performed similarly.

Retention

Although the retention rate for teachers from the APPEL-SpEd pathway was higher than the retention rate for teachers from the Traditional pathway, the difference was not significant. The finding that 94% of teachers from both pathways remained in special education specifically is encouraging given the well-documented challenges of retaining special education teachers nationwide (Billingsley & Bettini, 2019).

The identification of five teachers who appeared in student course records but had no CACTUS assignment for 2025-26, however, raises an important methodological concern: retention estimates based solely on CACTUS assignment data may undercount the number of educators who are still actively working in schools. For the Traditional pathway cohort, this misclassification would have changed the educator retention rate from 95% (106/112) to approximately 99% (111/112) if those five teachers had been counted as retained. Policymakers and researchers should be aware of this limitation when interpreting retention statistics derived from CACTUS assignment records.

Student Outcomes

The absence of statistically significant differences in student test score gains between teachers in the APPEL and Traditional pathways is consistent with the broader literature, but the wide confidence intervals (approximately 0.2 to 0.3 standard deviations) indicate that the current analysis has limited statistical power to detect meaningful differences. This is largely a function of sample size: with only 25 APPEL-SpEd teachers linked to students, and many of those teachers linked to fewer than 10 students with valid test score data, estimates of the pathway difference are inherently imprecise. As the APPEL-SpEd program matures and more teachers complete the pathway, the available sample will grow and future analyses will be able to detect smaller differences with greater confidence.

The disproportionate underrepresentation of preschool and elementary special education teachers in student course records (55% match rate vs. 89% for other roles) is a structural data limitation that deserves attention. Because Acadience Reading — the primary standardized assessment for early elementary students — was effectively unavailable for analysis due to this gap, the current study's student outcomes findings are limited to grades 3–10 and do not capture outcomes for the youngest students with disabilities.

Recommendations

Based on the findings and data quality considerations identified in this report, the following recommendations are offered to strengthen the accuracy of the educator workforce data, improve the usefulness of evaluations of the impact of preparation programs, and advance how Utah supports an

integrated system of educator preparation pathways that contributes to the educator workforce (i.e., supply and retention), educator effectiveness, and student success.

1. **Continue longitudinal monitoring of APPEL-SpEd outcomes.** The current findings are encouraging but are based on a single cohort with a modest sample size. Continued monitoring across multiple cohorts will yield more precise and generalizable estimates of retention and student outcomes.
2. **Improve teacher-to-student linkage in administrative data.** The low match rate for preschool and elementary special education teachers in student course records limits the ability to evaluate educator effectiveness for a critical segment of the special education workforce. Adding a supplemental teacher identifier field to the student course table that can capture multiple teacher IDs per student record would improve data completeness for future research and accountability purposes.
3. **Reconcile CACTUS assignment records with other educator data sources.** The five teachers who appeared in student course records but lacked CACTUS assignments for 2025-26 suggest that CACTUS assignment records alone may not fully capture educator presence in schools. Cross-referencing CACTUS assignment data with student course records when computing retention statistics could produce more accurate counts of retained teachers. However, this is true only if those teachers meet the eligibility conditions for retention (e.g., being appropriately credentialed).
4. **Examine student outcomes for early childhood and elementary special education populations.** As data linkage improves, future studies should prioritize capturing outcomes for preschool and early elementary students with disabilities, who were under-represented in the current analysis.
5. **Study attributes of the pathways.** Although there continues to be a positioning of ARL programs against university-based preparation programs (Hedrick-Shaw, 2025), some researchers question whether a clear distinction can be made between the two pathways and instead recommend focusing research attention on the specific practices found within each pathway (Wilson & Kelley, 2022): coursework, clinical experiences, supervision, mentoring, and final assessments of preparedness and licensing recommendations. These may explain more of the variance in teacher effectiveness than the broad pathways explored in the present report.

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