Poverty Index Specificity and Academic Achievement in South Carolina: An Example of Building Teacher Candidate Advocacy One Policy Consideration at a Time

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Numerous teacher preparatory programs place emphasis on instructional advocacy within their curriculum. This article discusses a pathway teacher educators can use to connect candidates with research-based knowledge and skills that sync broad policy to practice, developing a comprehensive approach to advocating for education. The author sought to promote policy-based advocacy by quantitatively illustrating a district funding metric that differs comparatively in specifying need for particular levels of school poverty on academic achievement. At its conclusion, practical tips on discussing research ideas with teacher candidates and how candidates can advocate for more equitable conditions for teachers and students are offered.

Keywords: teacher preparatory education, policy, poverty, academic achievement

Many teacher preparatory programs develop future educators with the skills needed to engage in elements of activism. Scholars claim that advocacy by educators can be critical in making sustainable education policy changes (Bradley-Levine, 2018; Hesson & Toncelli, 2019; Linville, 2020). Although time has shown that teachers have had substantive impact in carving the focus of state funding priorities, research has noted that when teachers take part in advocacy, they often engage in instructional over political advocacy (Linville, 2020). In teacher education programs, candidates are troubled by limited knowledge of school district legislation and the appropriate steps to take to challenge legislative norms (Holmes & Herrera, 2009). Derrington and Anderson (2020) assert that "the knowledge and skills educators gain through advocacy can build a bridge between policy and practice" in order to increase education outcomes (p. 14).

Education advocates pursue topics such as academic achievement parameters, resource allocation, and public dissemination of school district conditions on the construct of providing a quality instructional environment (South Carolina Legislature, n.d.). As teacher educators illustrate the effects of poverty in education for teacher candidates through an instructional lens and how to advocate for equitable classroom practices (Bazemore-Bertrand and Handsfield, 2019; Dunbar, Winship, and Harper, 2019; Hilton and McClearly, 2019; Kretchmar and Zeichner, 2016), policy-based advocacy can become a natural by-product of this focus.

This article walks readers through a line of logic that was used to inform teacher candidates of a familiar area open for advocacy. Through the forthcoming exercise, the author uncovers how research-based efforts can birth the acknowledgement of

legislative norms that seek to protect quality instructional approaches, such as accurate, representative funding. Candidates were pressed to consider how the state determines need by examining the quantitative difference between the current poverty metric's relationship with achievement to a similar metric's relationship with achievement. After a brief analysis, teacher candidates' understanding of poverty in policy, coupled with the traditional instruction-based reflection of its manifestation in the classroom, gave candidates perspective that could propel them to become agents of change from the beginning of their professional journey.

Background Information: Legislative Approaches to Address Poverty in Schools

As reinforced by Augsburger, Morse, and Tucker (2017), almost 300,000 South Carolina children live in poverty. Acknowledging that "children living in poverty can benefit from increased access to... quality learning environments" (Augsburger, Morse, and Tucker, 2017, p. 2), the way in which systems appropriately allocate limited resources in state school districts is vital. School systems continue "to alleviate poverty and enhance economic mobility by equalizing educational opportunities," (Keeney, Hohmana, and Bergman, 2019, p. 149). In South Carolina, high profile state litigation has sought to preserve equitable education for impoverished districts for decades. In the *Abbeville County School District v. State* cases, the state supreme court acknowledged the impact that pervasive poverty had in providing a minimally adequate education (335 S.C. 58, 68, 515 S.E.2d 535, 540 (1999); 410 S.C. 619, 624, 767 S.E.2d 157, 159 (2014)).

Because poverty is frequently used to quantify need, the state funding formula uses district poverty measures to expand across functions. Mentioned annually in the fiscal year funding manual, the state appropriation begins with a base student cost model and weighted pupil units (S.C. Code Ann. § 59-20-10) which is established on a district calculation, with poverty used multiple times to distinguish need (South Carolina Department of Education, n.d.). Specifically, the rate of poverty is used to identify students at risk of school failure (Early Childhood Development and Academic Assistance Act of 1993; Education Accountability Act of 1998; S.C. Code Ann. § 59-1-450 [2004]; S.C. Code Ann. § 59-139-05 et seq. [2004]; S.C. Code Ann. § 59-63-65 [2004]; S.C. Code Ann. § 59-63-1300 [2008]; General Appropriations Act for 2019-2020, Provisos 1A.24), to provide funding for early childhood programs (General Appropriations Act for 2019-2020, Proviso 1A.22), are a part of the calculation for determining bus driver salary (S.C. Code Ann. § 59-18-1910-1920; General Appropriations Act for 2019-2020), and is used to determine a portion of the calculation for the Child Early Reading Development and Education Program for Full Day 4K (S.C. Code Ann. §59-156 General Appropriations Act for 2019-2020, Proviso 1.57). Also, per the Education Accountability Act (S.C. Code Ann. § 59-18-310 [2017]), 25 percent of the Education Improvement Act fund is based on the district poverty index. Having a poverty index of 70% or higher can qualify a district for capital improvement, afforded by the General Fund (General Appropriations Act for 2019–2020, Proviso 1.88). In South Carolina, the *pupils in poverty* metric has its own classification/revenue code and receives revenue from education license plates (S.C. Code Ann. § 56-3-5010 [2004]).

The district poverty index metric is connected to sweeping policy that

theoretically trickles down to meet the needs of students. At the federal level, South Carolina uses district poverty to define needed support for effective instruction (Title II, Part A, Sec. 2101-2103, of the Elementary and Secondary Education Act [ESEA] of 1965, as amended through Every Student Succeeds Act [ESSA], PL 114-95, December 10, 2015, 129 Stat 1802), in awarding grants associated with the 21st Century Community Learning Centers Program (a subgrant program funded by the U.S. Department of Education, authorized by the ESEA of 1965, as amended by the ESSA, Title IV, Part B; 20 U.S.C. 7171–7176, and administered by the South Carolina Department of Education [CFDA No. 84.287C]), and eligibility for the Rural and Low-Income School Program (Title V, Part B, Subpart 2 of the ESEA of 1965, as amended through ESSA, PL 114-95, December 10, 2015, 129 Stat 1802). In addition, a special revenue fund directed towards adult education considers the district poverty index (Title II of the Workforce Innovation and Opportunity Act [Pub. L. 113-128] July 2014 Catalog of Federal Domestic Assistance 84.002). Tied to distinct resources, being identified as impoverished is imperative in providing tailored resource allocation on which teachers depend to provide adequate instruction.

The Catalyst: Differences in Poverty Amongst and Within School Districts

The range of poverty indices in South Carolina within a district is expansive for some districts and narrow for others (South Carolina Department of Education, n.d.). In 2019, the district with the lowest poverty index was York (21.14) and the elementary school with the lowest index was within the Berkeley district (8.54). On the contrary, the district with the highest poverty index was Allendale (94.19) and the elementary school with the highest was in Florence 1 district (98.65). Further, Greenville school district, composed of 52 elementary schools, housed poverty indices that ranged from 11.21 to 96.09. Charleston, who also housed 52 elementary schools, ranged from 11.69 to 96.97. Richland 1's district was comprised of 30 elementary schools with poverty indices that ranged from 23.68 to 98.54. The 29 elementary schools of Horry district stretched from 37.78 to 92.36. Alternatively, some districts were made up of only one elementary school. Allendale had an elementary school poverty index of 93.6, Clarendon 1 had an index of 95.21, Clarendon 3 had an index of 64.35, and Greenwood 52 had an index of 67.33.

As poverty plagues particular districts, South Carolina districts consider consolidation (Adcox, 2020). Research has noted its positive and negative effects (Cooley & Floyd, 2013; Howley, Johnson, & Petrie, 2011; Jakubowski & Kulka, 2016; Siegel-Hawley, Diem, and Frankenberg, 2018). If school districts were to consolidate (or deconsolidate), the district poverty index could be different, as would the resources made available. Understanding that academic achievement can have a statistically significant relationship with poverty, how poverty is calculated and how it is used to equalize funding in policy becomes crucial in determining equity.

The Lesson: Connecting Poverty Measures and Achievement

Ultimately, efforts for education funding are largely based on a desire to attain academic achievement for all students, regardless of the economic status of a school. One can consider how achievement is effected at different poverty indices and whether there is any difference when measured at the district level than when measured at the school level to illustrate measurement impact. Studies have noted

distinction in core subject area achievement as a function of poverty by researching the effect of instructional expenditure ratio grouping on subject areas (Hoisington, Slate, Martinez-Garcia, and Barnes, 2018; Jones and Slate, 2010; Jones and Slate, 2011). Using the instructional expenditure ratio as the independent variable and subject areas as the dependent variable, Hoisington, Slate, Martinez-Garcia, and Barnes were able to determine that a statistically significant difference occurred for students who were economically disadvantaged (2018).

Methods

The purpose of the examination was to illustrate whether there was a need to consider poverty specificity by way of its effect on academic achievement. The inquiry tested whether the level of distinguishability differed between the adopted poverty metric when measured against achievement (i.e., district poverty metric) to that of a similar but different measure (i.e., schools poverty metric). Any difference would be substantive in acknowledging in that poverty specificity points to variance in a calculation that defines fiscal need in state and federal policies. The research questions in this examination were: (1) What is the effect of the district level poverty index on student achievement; (2) What is the effect of the school level poverty index on academic achievement; and (3) How do the results of Question 1 and 2 differ?

Measures of Analysis

Following a similar style to Hoisington, Slate, Martinez-Garcia, and Barnes (2018), a General Linear Model (GLM) One-Way Multivariate Analysis of Variance (MANOVA) statistical analysis was run to determine the effect of poverty on academic performance for students in South Carolina. Using a composite academic achievement metric to maximize the differences between groups of the poverty levels, the exercise sought to determine whether there was a significant difference between elementary school poverty levels on academic achievement and whether there was a significant difference between district poverty levels on academic achievement.

Using 2019 data, elementary school (n=635) and district (n=80) level academic achievement (dependent variable) included a metric of English Language Arts, Mathematics, Science, and Social Studies achievement for the percent of students that met or exceeded grade level expectations on the statewide assessment (South Carolina Department of Education, n.d.). The poverty index metric at the elementary school and district level (independent variable) defined the percent of students in poverty (Temporary Assistance for Needy Families, Medicaid, Supplemental Nutritional Assistance Program, foster child, homeless or migrant), as defined by South Carolina's Education Finance Act. To prepare for the analysis, poverty indices were divided into quintiles (0-59.9%, 60-69.9%, 70-79.9%, 80-89.9%, 90-100%). Preliminary data revealed that the standard deviation across the means of any particular level, in any particular subject area, was between three and four for elementary schools and districts.

Validity and Reliability

When district and elementary school values were measured for preliminary assumptions, data was normally distributed for each subject area for poverty indices, as assessed by Kolmogorov-Smirnov (except for district level Mathematics poverty at the 80-89% level and school level Mathematics, Science, and Social Studies at the 0-59% level). Multicollinearity was not present for both analyses. Additionally, there was a

linear relationship between the variables (Normal Q-Q Plots) and homogeneity of variance-covariances matrices (Box's test of equality of covariance matrices (p = .000)). Testing revealed that each sample contained univariate and multivariate outliers, however. Because MANOVA is robust to deviations for particular assumptions, the analysis was able to persist (Field, 2013).

Being that this study was shared with pre-service elementary school teacher candidates, the school value focused on elementary schools. An important limitation of this scope is that one measure is the summation of elementary schools in the state and the other is a summation of districts in the state. Knowing that district values represent all grade levels, the findings of the study must consider how the results would differ if middle/high school scores were included. General theoretical limitations also exist. Any attempt of this study to be generalized outside of its scope will be subject to policy practices exercised within the jurisdiction of the population. This study observed one year of data. As a result, its findings can only serve as a baseline.

Results

In observation of academic achievement, the study was able to determine whether there was a statistically significant difference between the groups of poverty levels at the district and school level.[1] GLM MANOVA analysis revealed that there was a statistically significant difference between district poverty indices on combined academic achievement, $F(16, 217.55) = 13.878$, $p < .0005$; Wilks' $\Lambda = .117$; partial $\eta2 = .416$. A Bonferroni alpha level correction was made to determine statistical significance of univariate one-way ANOVAs. Results exposed a statistically significant difference in English Language Arts ($F[4, 74] = 70.518$, $p < .000$; partial $\eta2 = .792$), Mathematics ($F[4, 74] = 39.669$, $p < .000$; partial $\eta2 = .682$), Science ($F[4, 74] = 53.983$, $p < .000$; partial $\eta2 = .745$), and Social Studies ($F[4, 74] = 44.490$, $p < .000$; partial $\eta2 = .706$) achievement between students who met or exceeded expectations from different district poverty indices. GLM MANOVA analysis also revealed that there was a statistically significant difference between elementary school poverty indices on combined academic achievement, $F(16, 1900) = 55.665$, $p < .0005$; Wilks' $\Lambda = .309$; partial $\eta^2 = .254$. Results revealed that there was a statistically significant difference in English Language Arts ($F[4, 625] = 295.966$, $p < .000$; partial $\eta^2 = .654$), Mathematics ($F[4, 625] = 168.176$, $p < .000$; partial $\eta^2 = .518$), Science ($F[4, 625] = 169.109$, $p < .000$; partial $\eta^2 = .520$), and Social Studies ($F[4, 625] = 156.162$, $p < .000$; partial $\eta^2 = .500$) achievement between elementary schools of different poverty indices.

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[1] Descriptive statistics revealed that district poverty rates of 0-59.9%, 60-69.9%, 70-79.9%, 80-89.9%, 90-100% achieved higher in Social Studies (M = 72.9, SD = 7.9; M = 69.7, SD = 7.0; M = 61.0, SD = 8.9; M = 41.9, SD = 6.1; M = 38.2, SD = 11.0, respectively) than in English Language Arts (M = 52.3, SD = 6.6; M = 44.7, SD = 5.7; M = 36.3, SD = 4.5; M = 25.1, SD = 3.8; M = 22.8, SD = 5.9, respectively), Mathematics (M = 52.3, SD = 9.7; M = 46.2, SD = 8.9; M = 37.4, SD = 6.8; M = 23.6, SD = 5.6; M = 20.5, SD = 6.0, respectively), and Science (M = 55.3, SD = 8.3; M = 50.6, SD = 7.5; M = 42.0, SD = 6.4; M = 27.0, SD = 5.8; M = 20.8, SD = 7.0, respectively). Alternatively, descriptive statistics revealed that elementary school poverty rates of 0-59.9%, 60-69.9%, 70-79.9%, 80-89.9%, 90-100% also achieved higher in Social Studies (M = 82.8, SD = 11.5; M = 74.9, SD = 10.9; M = 69.0, SD = 11.5; M = 59.8, SD = 14.0; M = 45.9, SD = 16.3, respectively) than in English Language Arts (M = 63.0, SD = 12.6; M = 50.4, SD = 8.0; M = 43.2, SD = 8.4; M = 33.9, SD = 8.6; M = 25.7, SD = 9.6, respectively), Mathematics (M = 64.9, SD = 15.0; M = 54.9, SD = 11.1; M = 48.3, SD = 11.6; M = 38.9, SD = 12.3; M = 27.8, SD = 11.8, respectively), and Science (M = 66.8, SD = 14.6; M = 57.4, SD = 11.9; M = 49.3, SD = 12.8; M = 38.3, SD = 14.1; M = 28.1, SD = 13.2, respectively).

Discussion

A Games-Howell post-hoc test showed that for each academic subject area, elementary school poverty index quintiles were statistically significant. For English Language Arts, Mathematics, Science, and Social Studies, school poverty indices less than 60% had statistically significant higher mean scores than school poverty rates that were higher. School poverty indices that were 90% or greater had statistically significantly lower mean scores than school poverty rates that were lower. A Tukey post-hoc test showed that districts had generally statistically significant lower mean scores when paired with higher rates of poverty. There was not a statistically significant difference between districts with a poverty index of 80-89.9% and 90-100% for English Language Arts, Mathematics, Science, and Social Studies ($p = .889$, $p = .912$, $p = .311$, $p = .862$, respectively). This was also true for 0-59.9% and 60-69.9% poverty indices for Mathematics, Science, and Social Studies ($p = .158$, $p = .308$, $p = .785$).

Data consistently showed that district level poverty and school level poverty were not the same when considering the academic achievement of an elementary school and district. A common conclusion between the analyses was that as the rate of poverty increased per quintiles, the likelihood of a lower mean score increased for each subject at the school level. Observing poverty index by school was more precise and significant than district poverty index observations. At particular levels of elementary school poverty, there was statistical influence in how impoverished a school was from another across the state that would normally be indistinguishable when grouped by district for particular levels (at the tails of the quintiles). Specificity became lost for particular areas at the district level in the quintiles.

The Exit Slip: Policy-Based Advocacy

The MANOVA method helped determine whether academic achievement in core subject areas differed based on district and school level poverty indices. If state policy were to switch to school-based indices in some of its legislation to satisfy distinguishability at certain poverty levels, there may be a difference in how it disperses resources that effect the classroom. Nonetheless, intended and unintended consequences are likely, which could be commensurate to an overhaul of the state funding formula. Consolidation, despite its varying effects due to aforementioned differences, could remain the desired, least intrusive solution. The potential consequences of such actions were not the primary points of the discussion to candidates.

The goal of the exercise was to develop policy-based, critical thinking skills in candidates that promote equitable environments that extend beyond the physical classroom to theoretical challenges which would require advocacy. A capital point to teacher preparatory programs is to make research-based, policy advocacy a priority in the teacher education curriculum; not to establish partisanship, but to merge engaged citizenship with theories and practices that effect the classroom. In doing this, a sense of control can be ignited in candidates (and, ultimately, teachers) by exposing what may lie in policy and data that can directly effect the classroom.

After such an exercise, teacher educators can prompt candidates with the following: (1) How could you present research-based findings to stakeholders and representatives; (2) How does your clinical placement school-level poverty index compare to the district level poverty index; (3) What could that mean when it comes to funding poverty in your classroom; (4) How

does your clinical placement meet the needs of impoverished students; (5) Is this noticeable in comparison to other classrooms; (6) How could you determine this; (7) Do you believe the results of the exercise are consistent across middle schools and high schools in the states; (8) Why do you believe this; (9) How could you investigate this; (10) What could impact the differences you may observe; (11) Is there a difference in how poverty manifests itself at the different grade levels; (12) If so, how does poverty manifest itself at the different grade levels; (13) Explain how you can advocate for students in poverty at your school one research-based issue at a time; (14) Explain how you can advocate for students in poverty in your district one research-based issue at a time; (15) Explain how you can advocate for students in poverty in your state one research-based issue at a time; (16) Inquire how your district uses its poverty-based funding to support school needs; (17) Inquire how your school uses its poverty-based funding to support classroom needs; (18) Organize a teacher education department-based advocacy team to bring awareness of education policy effecting schools and constituents; (19) Attend/Join non-partisan, not-for-profit education events; (20) Write local and state representatives about poverty-based fiscal concerns; and (21) Read research-based literature.

Researchers continue to outline the demand for teacher preparation programs to prepare students to work with students of poverty in the age of a persistent academic achievement gap (Davis, 2019). Acknowledging that academic achievement in the face of policy continues to be a challenge (Alexander and Jang, 2020), teacher preparatory programs have the ability to broaden its scale by normalizing advocacy beyond the classroom. Samuels, Samuels, and Self (2019) state, "We must create opportunities to allow teachers to engage in self-reflection and meaningful dialogue to better develop their knowledge, skills, and dispositions so they have the commitment and courage to foster a responsive climate…" (p. 84). Equipping students with multifaceted tools and perspectives is what leads to lasting research-based, policy-encompassing impressions. Levine (2018) claims that teacher advocacy involves practicing teacher leadership and leading for social justice. Teacher educators can help candidates advocate for this one policy consideration at a time.

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