ABSTRACT

Michael J. Elder, LEVELING THE PLAYING FIELD: ACHIEVING PROPORTIONAL GIFTED REPRESENTATION THROUGH OPPORTUNITIES TO LEARN AND NONVERBAL ASSESSMENTS (Under the direction of Dr. R. Martin Reardon). Department of Educational Leadership, May 2022.

Administrators in school systems strive to ensure that the identification of giftedness in elementary students results in proportional demographic representation. Overly stringent or biased gifted identification results in deserving students receiving fewer opportunities-to-learn and exacerbates the excellence gap. My aim in this action research for transformation project was to utilize three complementary perspectives on the continuum of giftedness to generate a more representative pool of students who will be further screened and potentially offered the opportunity to participate in the gifted education programming in East Carolina County Schools. One perspective was provided by a nonverbal identification instrument, another perspective by the nonverbal form of a well-established test of academic ability, and the third perspective by a science-oriented, classroom-based instructional program. Teachers of Grade 3 and Grade 4 and their students at a rural, low socio-economic, and diverse elementary school participated in this three-month, school-based intervention to achieve proportional representation of Black and Hispanic students among those accepted into the gifted education program.

As a result of my study, several modifications to current practice have been suggested and key questions for future research emerged. The combined role of one nonverbal assessment along with teacher observations proved partially effective. By further adding the identification of the top 10% in demographic groups, my study showed promise to achieving the goal of a truly level playing field.

LEVELING THE PLAYING FIELD:
ACHIEVING PROPORTIONAL GIFTED REPRESENTATION THROUGH OPPORTUNITIES TO LEARN AND NONVERBAL ASSESSMENTS

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Doctor of Education in Educational Leadership

by

Michael J. Elder

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DEDICATION

I would like to dedicate this work to my parents, Dee and Skip Elder and my grandfather, the Rev. Dr. Robert H. Thurau. To my parents who always worked to instill an attitude of acceptance of and service to others while making many opportunities available to me. For encouraging me across all the years, my action research for transformation is one payoff for all the investments you made in me.

To grandpa, Rev. Dr. Robert H. Thurau, sitting on your front porch one spring day early in my teaching career, you simply asked, “When are you going to write your dissertation?” Always encouraging, but doing so in love. Thank you for the kind words and the belief in potential. This work is due in large part to that conversation. Thank you for blazing the way and encouraging so many to be the best version of themselves in the process.

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Most importantly to my family who has provided me with never ending support through the long weekends and late nights. To my wife, Wendy, and daughter, Sydney, you lived this journey with me and I would not have been able to do it without you.

Finally, to my chair, Dr. R. Martin Reardon, I give my deepest thank you. You helped me to see things in new light and always encouraged me. You took the time to talk and work as learning partners. I am forever grateful and thankful we were able to grow together.

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CHAPTER 1: INTRODUCTION

This dissertation in practice is designed to ameliorate the underrepresentation of students of color, specifically Black and Hispanic students, in the academically gifted student program within East Carolina County Schools (ECCS, a pseudonym). Current practices resulted in the under-identification of Black and Hispanic students. My project sought to create a more inclusive protocol in the expectation that its application will give rise to more equitable identification. The results of this project were designed to guide the future practice and decision-making process of gifted services across ECCS.

Academically Gifted Students

Traditional definitions of academic giftedness have focused on identifying and cultivating intelligence in order to benefit some need within society (Subotnik et al., 2011; Terman, 1925). More current views of giftedness exist on a continuum from single point qualifying IQ scores to multiple measures for inclusivity (Renzulli, 2012). The interplay of above-average ability, task commitment, and creativity are what Renzulli (1978) termed the Three Ring Conception of Giftedness to describe the behaviors of gifted individuals.

The National Association for Gifted Children (NAGC) (2019) defined giftedness by comparing the performance (or potential performance) of students to peers of similar ages and experiences. Further, these students require modifications to their learning in order to reach their potential. The North Carolina definition of giftedness is derived from the NAGC definition and contains the same principles. Gifted students are those who are capable of achieving at higher levels than their peers who have similar experiences and backgrounds (North Carolina Academically or Intellectually Gifted Students, 1996/2018). While some students may currently exhibit gifted behaviors and benefit from gifted services, the definition of giftedness also points to students whose

giftedness may not yet be visible and may need nurturing. Coleman (2016) elaborated on nurturing as approaching students and gifted identification from an at-potential mindset. Not all students have the experiences to make their gifted characteristics visible especially in the elementary grades. Traditional curriculum standards may be enhanced and allow for more development and exposure of giftedness when all students are viewed at-potential and are given the opportunity to engage in hands-on science activities to demonstrate thinking and problem solving (Kern, 2009). A deeper discussion of the history and current views on giftedness is shared in Chapter 2.

Delineating the Contours of the Problem

Each Local Education Agency (LEA) serving students in the public schools of North Carolina is mandated to follow General Statute 115C-150.5-.8 Article 9b (North Carolina Academically or Intellectually Gifted Students, 1996/2018). This legislation protects the rights of gifted students by requiring LEAs to write and implement gifted services plans which include details regarding identification, program services, differentiation, personnel, professional development, partnerships, and accountability.

In ECCS, strategic plans for gifted education were written in 1996 to align with the state mandate and they have been revised every three years since that time. However, despite the modifications to identification procedures and program delivery, as shown in Table 1, the underrepresentation of students from subgroups including Black and Hispanic students persisted. As Curran (2020) showed compellingly, the measurement adopted can lead to vastly different figures that support drastically different conclusions regarding racial disparities. Using data on student discipline, Curran compared the strengths and weaknesses of three distinct measures of disproportionality: risk ratio (the quotient of the proportional identification within the two categories being considered), risk difference (the difference between the proportional

Table 1

ECCS Elementary Risk Ratio, Risk Difference, and Raw Differential Representation

Elementary School #	Total Number Identified	Total Students	Race	Race Identified	Race Enrolled	Race	Race Risk Ratio	Race Risk Difference	Race Raw Differential Representation (RDR)
1	22	197	Black	5	75	Black	0.32	-0.14	-10.57
			Hispanic	3	38	Hispanic	0.38	-0.13	-4.89
			White	11	53				
2	21	155	Black	0	27	Black	0.00	-0.19	-5.08
			Hispanic	3	29	Hispanic	0.55	-0.08	-2.46
			White	16	85				
3	55	275	Black	9	51	Black	0.80	-0.04	-2.18
			Hispanic	8	64	Hispanic	0.57	-0.09	-6.04
			White	25	114				
4	13	116	Black	2	43	Black	0.24	-0.15	-6.32
			Hispanic	2	29	Hispanic	0.36	-0.12	-3.61
			White	6	31				
5	73	599	Black	2	25	Black	0.59	-0.06	-1.40
			Hispanic	8	63	Hispanic	0.93	-0.01	-0.57
			White	60	441				
6	23	285	Black	2	19	Black	1.11	0.01	0.20
			Hispanic	1	41	Hispanic	0.26	-0.07	-2.88
			White	19	201				

Table 1 (continued)

Elementary School #	Total Number Identified	Total Students	Race	Race Identified	Race Enrolled	Race	Race Risk Ratio	Race Risk Difference	Race Raw Differential Representation (RDR)
7	24	199	Black	1	46	Black	0.13	-0.14	-6.67
			Hispanic	4	56	Hispanic	0.43	-0.10	-5.33
			White	13	78				
8	20	203	Black	2	68	Black	0.19	-0.12	-8.30
			Hispanic	6	40	Hispanic	0.99	0.00	-0.06
			White	10	66				
9	28	243	Black	1	28	Black	0.25	-0.11	-2.95
			Hispanic	3	35	Hispanic	0.61	-0.06	-1.94
			White	22	156				
10	24	232	Black	0	36	Black	0.00	-0.10	-3.74
			Hispanic	6	39	Hispanic	1.48	0.05	1.94
			White	13	125				
11	20	135	Black	0	40	Black	0.00	-0.25	-10.00
			Hispanic	5	27	Hispanic	0.74	-0.06	-1.75
			White	11	44				
12	23	174	Black	1	33	Black	0.16	-0.16	-5.23
			Hispanic	1	27	Hispanic	0.20	-0.15	-4.10
			White	17	90				

Table 1 (continued)

Elementary School #	Total Number Identified	Total Students	Race	Race Identified	Race Enrolled	Race	Race Risk Ratio	Race Risk Difference	Race Raw Differential Representation (RDR)
13	29	218	Black	0	18	Black	0.00	-0.17	-3.08
			Hispanic	0	25	Hispanic	0.00	-0.17	-4.28
			White	26	152				
14	25	270	Black	1	26	Black	0.35	-0.07	-1.89
			Hispanic	3	45	Hispanic	0.60	-0.04	-2.00
			White	19	171				
15	35	198	Black	1	10	Black	0.53	-0.09	-0.90
			Hispanic	3	31	Hispanic	0.51	-0.09	-2.88
			White	26	137				
16	23	160	Black	3	26	Black	0.75	-0.04	-1.00
			Hispanic	3	25	Hispanic	0.78	-0.03	-0.85
			White	14	91				
17	23	272	Black	1	37	Black	0.26	-0.08	-2.88
			Hispanic	4	44	Hispanic	0.87	-0.01	-0.62
			White	17	162				
18	41	221	Black	2	28	Black	0.30	-0.17	-4.74
			Hispanic	3	33	Hispanic	0.38	-0.15	-4.95
			White	33	137				

Table 1 (continued)

Elementary School #	Total Number Identified	Total Students	Race	Race Identified	Race Enrolled	Race	Race Risk Ratio	Race Risk Difference	Race Raw Differential Representation (RDR)
19	11	184	Black	1	47	Black	0.32	-0.05	-2.13
			Hispanic	3	38	Hispanic	1.18	0.01	0.47
			White	5	75				
20	47	225	Black	0	7	Black	0.00	-0.21	-1.50
			Hispanic	5	26	Hispanic	0.90	-0.02	-0.56
			White	37	173				

identification within the two categories being considered), and raw differential representation (the product of the risk difference and the number of individuals in the category). The definition of all three measures and the nuances among them are discussed following Table 1 and in detail in Chapter 2. Suffice it here to say that the "risk" in this instance is the risk of being identified for inclusion in the gifted education program. Hopefully, for Black and Hispanic students, that risk would be high.

The variability across the schools was immediately apparent from Table 1. For example, focusing on the risk ratio columns, the 27 Black students at School 2 had zero risk of being identified while their 29 Hispanic peers were slightly better off with a 0.55 risk—bearing in mind that this risk translates to three students. By contrast, at School 10, while the 36 Black students also had zero risk of being identified, six of their 39 Hispanic peers were identified to yield a risk ratio of 1.48, meaning that Hispanic students were considerably more likely to be identified than their White peers. Parity in terms of zero risk was evident for both Black and Hispanic students in School 13, whereas even though lower than desirable, risk parity for Black and Hispanic students was shown in School 16 (0.75 and 0.78, respectively).

Underrepresentation in both referral as well as identification resulted in fewer services being offered to students who would benefit from academic talent development. Students were able to be identified in a variety of categories including the subject areas of reading, mathematics, or both reading and mathematics, or one of two more global categories: highly gifted, or intellectually gifted.

Proportional Representation

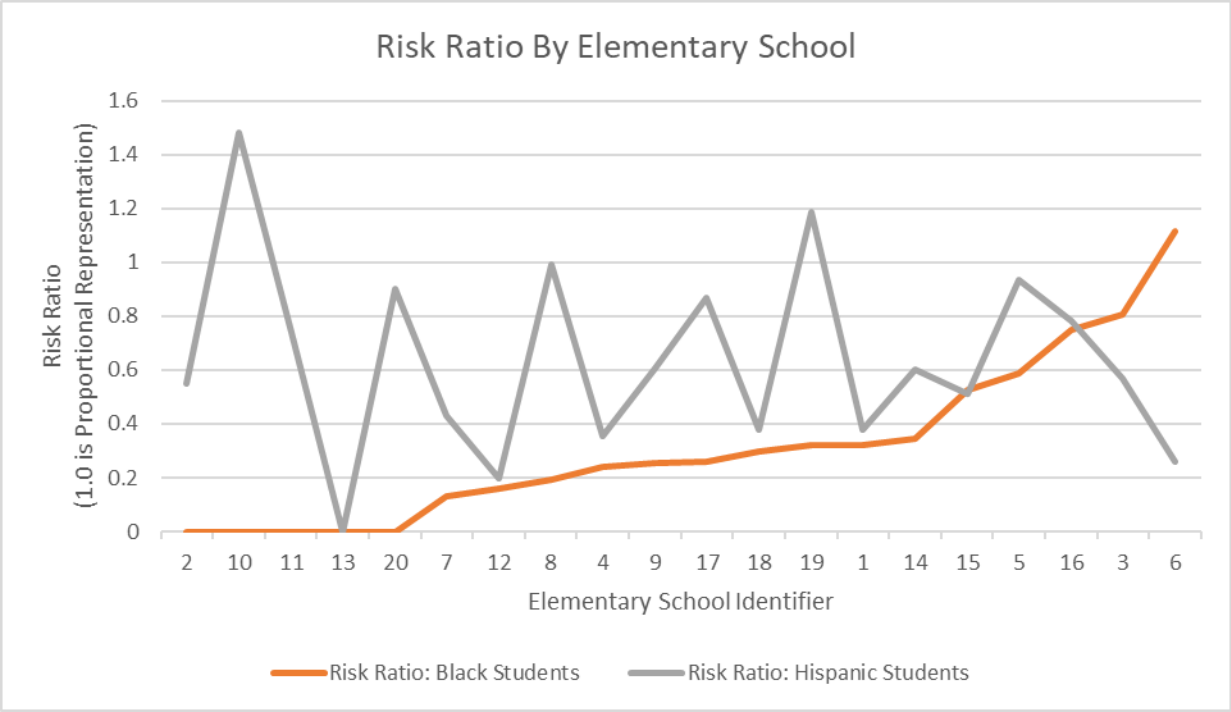
Underrepresentation occurs when a subgroup of a population fails to be included in a sample. The more general concept is disproportionality to which a value judgement is appended

to indicate that something in the disproportionality demands rectification. To return to the work of Curran (2020), he based his analysis on the earlier work of Girvan et al. (2019) who had previously discussed the differing conclusions that could be reached based on the calculations of the three conceptually related indicators of disproportionality: risk ratio, risk difference, and raw differentiational representation.

As Curran (2020) further explained these metrics, the disproportionality between Black and White students as indicated by the risk ratio is the proportion of Black students in some category divided by the proportion of White students in that same category. The risk difference was the difference between the proportion of Black students in some category and the proportion of White students in that category. Finally, the raw differential representation was the product of the risk difference and the number of Black students.

Each measure of disproportionality revealed administrative challenges to be confronted by those seeking to redress underrepresentation and each measure waes subject to limitations. However, viewed collectively and in the context of a specific school or district, together these metrics painted a picture that aided in understanding the challenge at hand. Figure 1 displays the risk ratio for each elementary school in ECCS. A value of 1.0 represents proportional representation. To further the discussion introduced above, at five schools the risk ratio is zero for Black students as there were no identified Black students at those school sites. At one site the risk ratio was zero for Hispanic students as well. This was a troubling data point and one of the reasons for my action research for transformation project.

Figure 1 shows that, while the current processes in ECCS identified a more proportionally representative population of Hispanic students, only three elementary schools achieved proportional representation or above (the comparison was with the White students in all



Note. The schools are arranged in ascending order of RR for the Black students.

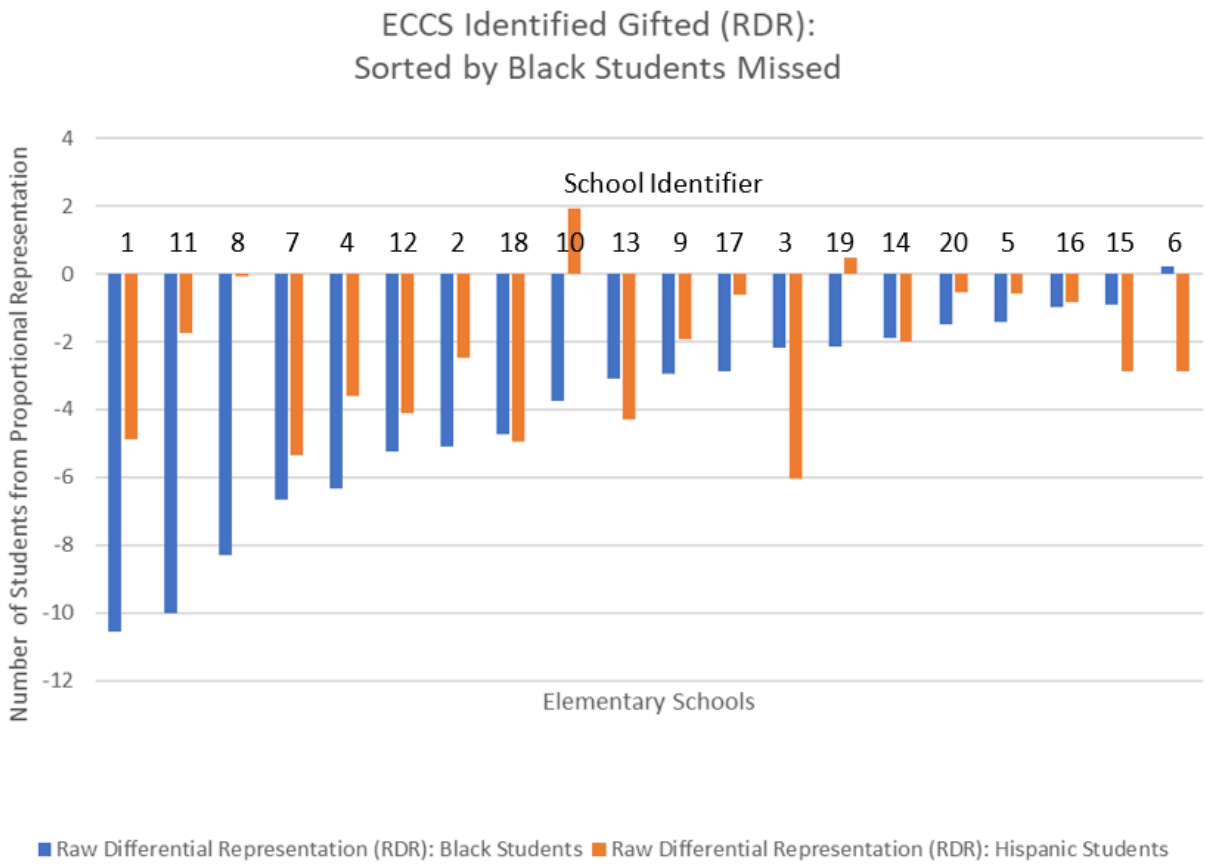
Figure 1. Risk Ratio (RR) Analysis of Gifted Identification for Black and Hispanic students in ECCS Elementary Schools.

cases). As Figure 2 demonstrates, all schools except one (School 10) in ECCS were failing to proportionally identify Black and Hispanic students. Moving from the risk ratio, the Raw Differential Representation (RDR) measure utilized the risk difference to calculate the approximate number of students that were not identified compared to the rate of White students identified. In seeking to form a partnership with a school for this action research for transformation project, I decided to use the RDR as my measure of choice as it took into account both the Risk Ratio (RR) and the Risk Difference (RD) and computed a more easily understood number. If more unidentified but eligible students are identified through my project, perhaps the goal of proportional representation will be achieved.

Of the schools that were willing to partner with me, I chose to collaborate with School 7. School 7 had the advantage from the perspective of my project of having nearly an equal number of Black and Hispanic students (46 and 56, respectively) who had approximately equal risks of being overlooked in the gifted identification process based on RDR (-6.67 and -5.33, respectively). Given the willingness on the part of both the administration and the teachers to engage in my collaborative project, I would be able to determine if my interventions were effective in improving the RDR with one, both, or neither of the Black and Hispanic students.

The Bottom Line

The disproportionality illustrated in Table 1 represented a credibility issue. Community members were acutely aware of the disparities. Teachers, especially from Black and Hispanic backgrounds, were acutely aware of it also. Students, especially by middle and high school, recognized the inequities inherent in the provision of enhanced learning opportunities for their friends and classmates who are identified when they believe themselves to be equally deserving. However, few advocates were poised to study and propose changes to the current practices, so



Note. The schools are arranged in ascending order of RDR for the Black students.

Figure 2. Raw differential representation measures for Black and Hispanic students.

the status quo continues. Each of these realizations called to question the credibility of the gifted program. A lack of credibility leads to a lack of support and may ultimately lead to the elimination of the program.

Working Towards Positive Change

In accord with the current district gifted strategic plan, teachers in ECCS collaborated with gifted specialists in the development of differentiated education plans for each identified student based on their area of identification and their strength. Gifted students also received a designation in the student information database so that administrators and teachers were aware of their identification. In practice, gifted identification led to opportunities for academic acceleration, content enhancement, enrichment, and additional support in ECCS. Therefore, an opportunity gap was created between children who have been identified and those who were qualified to be included but had been overlooked as a result of a flawed identification protocol.

A successful outcome of my study would result in a direct impact on the learning opportunities of children who have previously been underserved. Further, my study would create a research base to guide decisions for future program and staffing decisions. Utilizing tools which identify a more accurate and representative group of students would result in a system that better supports all gifted students.

Background of Focus of Practice

Students from lower socio-economic and/or culturally diverse backgrounds often go unseen and do not experience talent development in the ways that other groups do in educational settings (Briggs et al., 2008). Further, a recent meta-analysis of identification practices found that Black, Hispanic, and Native American students were only one-third as likely to be identified for inclusion in gifted education programs (Hodges et al., 2018).

Public school educators subscribe to an implicit social contract with the community: educators, schools, and school systems embrace the responsibility to identify and serve students in the most equitable manner possible. In response, organizations such as the School Superintendents' Association (ASSA) encourage schools to implement practices such as providing professional development for staff, engaging district leadership, and using multiple criteria for identification of children who may benefit from specially designed educational programming (Clarenbach, 2015). As gifted identification processes and procedures are developed, school systems create more equitable organizations when data from a variety of sources are embraced and acted upon through the intentional, informed efforts of all.

In accord with the above concepts and state mandate, students within ECCS were screened and tested for identification in gifted programs utilizing common measures of ability and achievement. These traditional screening and identification processes have been found across settings to hinder the ability of some populations to achieve identification (Cruz & Rodl, 2018; Peters et al., 2019). The process for identification in ECCS required a student to score at the 92nd percentile on either an ability or achievement measure as well as exhibit other characteristics conventionally associated with giftedness. While children could be identified in any grade level, the most common grade levels for identification were Grade 3, Grade 4, and Grade 5. The unfortunate reality was that the identification process ECCS has implemented has resulted in the proportional underrepresentation of Black and Hispanic students.

In recent years, administrators in ECCS worked to broaden access by utilizing multiple criteria for identification and by ensuring that no one criterion excluded a child from identification (see Figure 3). The use of the Cognitive Abilities Test (Lohman & Lakin, 2018) as a measure of ability and the Iowa Assessments (Iowa Testing Services, 2017) a measure of academic

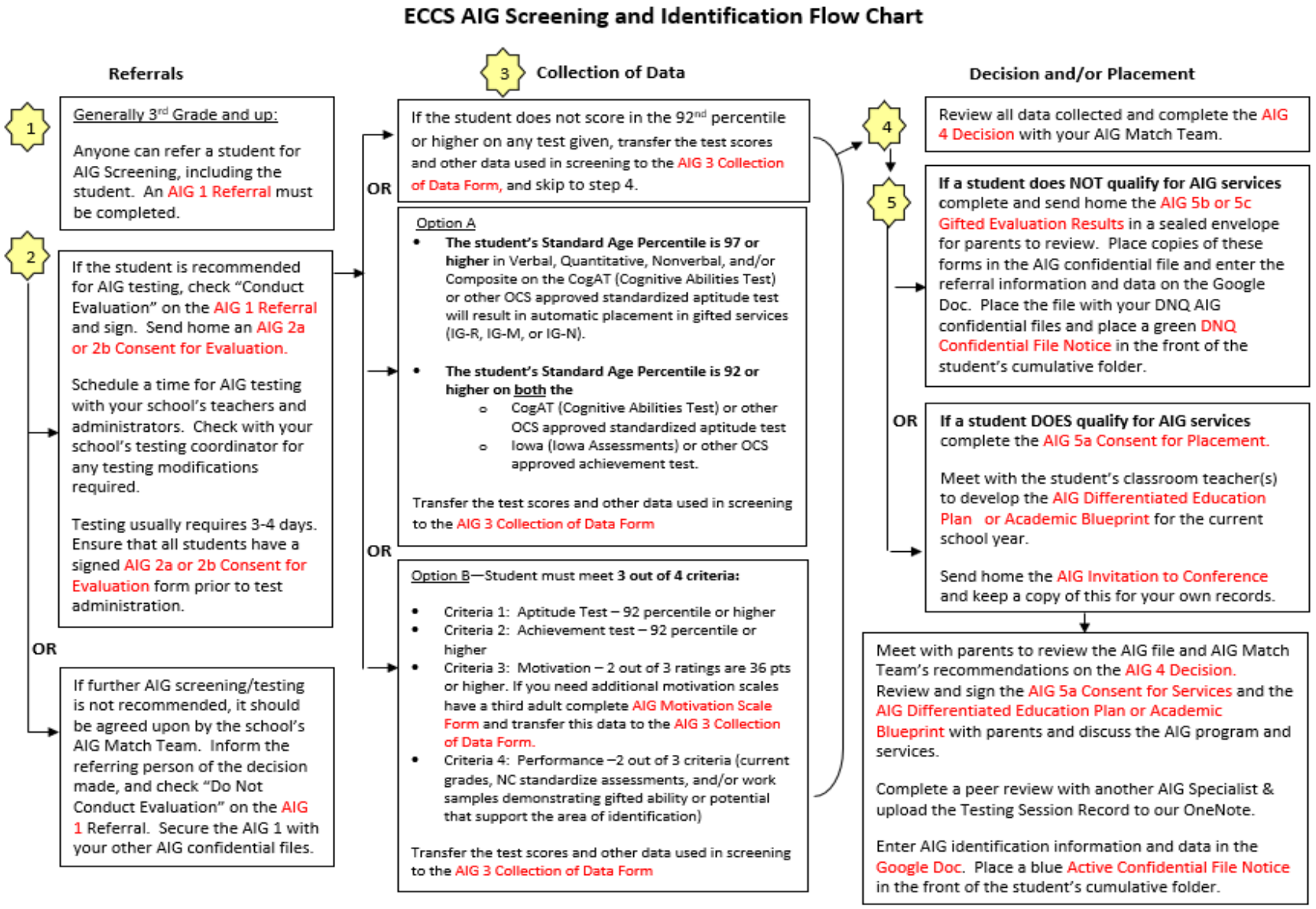


Figure 3. ECCS Gifted Identification Process flow chart.

achievement were the most commonly used identification tools, but students were also assessed on measures of motivation and classroom performance. Students who exhibited scores above the 92nd percentile on both the ability and achievement measure are automatically identified as gifted. This was referred to as Option A in ECCS.

For those who are not identified by means of testing, a second pathway, Option B, was also utilized for identification. Students must have reached the 92nd percentile on either the ability or achievement measure and then exhibit motivation and classroom performance. The complete identification protocol is shown in Figure 3 as a modified flowchart.

The implementation of nontraditional methods for identifying gifted students including nonverbal tests, student portfolios, and affective checklists has been shown to result in the identification of more students from underrepresented populations (Hodges et al., 2018). However, a singular approach was unable to address a challenging problem such as this. In light of the finding that the use of nontraditional methods alone did not facilitate proportionately equitable identification of students, other options including pairing testing with increasing opportunities-to-learn may showed promise. Therefore, in my project, I worked to expand on the current screening practices used in ECCS while adding additional opportunities-to-learn as part of the overall referral and identification process.

Context of Study

The participants and focus of my study were elementary students in ECCS. The district was comprised of approximately 13,440 students in Grade K through Grade 5 at 20 distinct school sites. Forty-five percent of students in the district were from low-income families.

Article 9b of the North Carolina Academically or Intellectually Gifted (NC AIG) Program Standards (NCGS 115C-105.7) (1996) stated a series of beliefs regarding gifted

students in North Carolina and requires that each local education agency (LEA) create a plan for the identification and services of gifted students. Since Article 9b was enacted in 1996, the past 24 years have witnessed the emergence of a robust vision for gifted programs in North Carolina. However, the implementation of local plans in ECCS and the associated review of data have raised questions of equity with regards to proportional representation of students of color. Using the ECCS 2019 Spring AIG Headcount as the data source, representational discrepancies across ethnic groups were evident. For example, as illustrated in Figure 4, Black students comprised 19% of the overall district population, yet only 8% of the gifted population. Hispanic students comprised 15% of the overall district population, yet only 10% of the gifted population. White students were 55% of the overall population, but 70% of the gifted population. Similar disproportional representation statistics have been noted in the "Counted Out" series shared through media outlets across North Carolina (Neff et al., 2017).

Statement of Focus of Practice

The purpose of my focus of practice was to create a framework for equitable identification of giftedness in elementary schools. Working in collaboration with gifted specialists, school administrators, teachers, and students, I implemented an intervention based on an iterative refinement cycle. By implementing a screening instrument along with academic talent development opportunities, my intervention sought to develop scalable procedures for opening access to a more diverse population of gifted students.

Demographics of ECCS

The demographics of the students identified as gifted in ECCS indicated proportional underrepresentation of Black and Hispanic students and the overrepresentation of White students. It is possible that the identification protocol in place in ECCS discriminates against

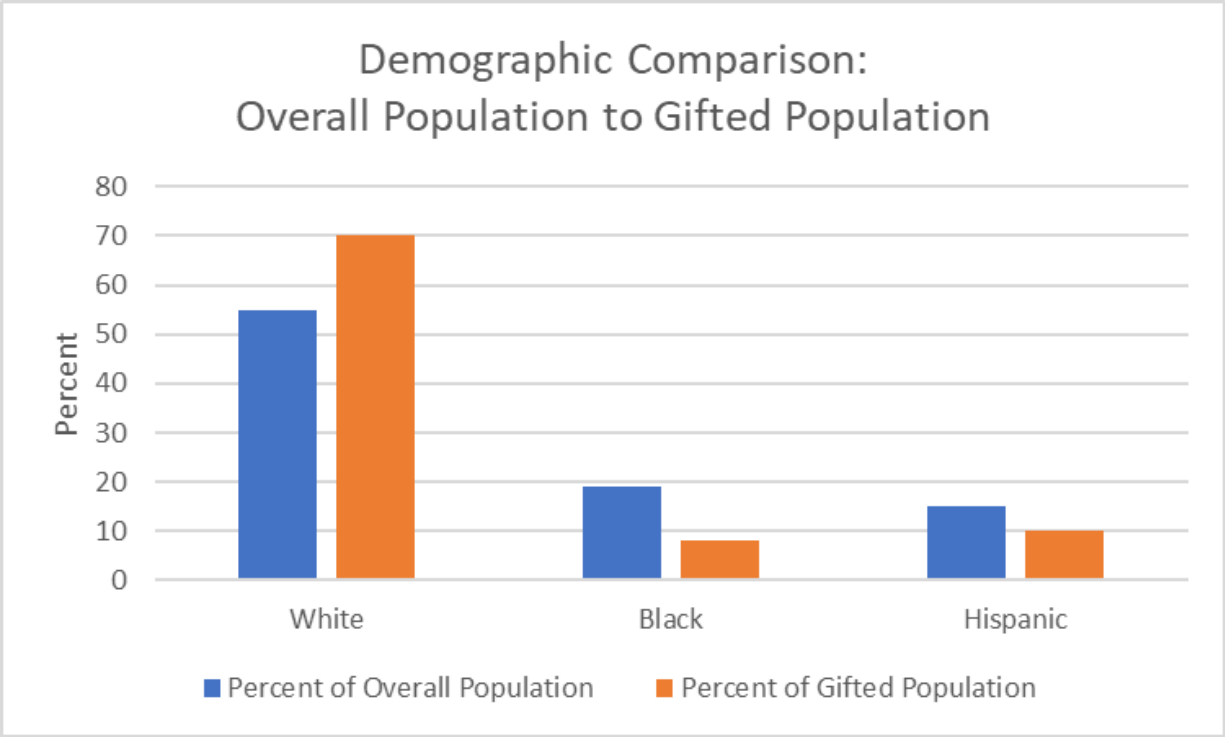


Figure 4. Demographic comparison of overall population percent to percent of gifted population.

Black and Hispanic students by (a) using tests of ability and achievement which may incorporate elements of cultural bias, and (b) using survey instruments to estimate student motivation which may themselves incorporate elements of bias. My study examined the impact on the demographics of students referred for and ultimately accepted into the gifted education program in ECCS of implementing a talent development approach, providing enhanced teacher professional development, and instituting a nonverbal screening tool. The specific problem I addressed in this study was that current identification practices led to proportionally inequitable identification. This created opportunity gaps which likely exacerbated achievement gaps for our students as they move through grades—especially for Black and Hispanic students within ECCS.

A New Approach

Gifted intelligence can be viewed as the result of the relationship between a child's capacity for learning and their experiences (Rollins et al., 2009). By providing students with engaging educational experiences focused on the linking of science and literature while assisting teachers in recognizing potential giftedness, Kern (2009) found that nearly 25% of students were considered for gifted services after implementing Using Science, Talents, and Abilities to Recognize Students~ Promoting Learning for Under-Represented Students (U-STARS~PLUS) resources. These students would have been overlooked using that district's traditional screening techniques. U-STARS~PLUS provides an observation protocol, questioning strategies, lesson materials, and parent engagement packets designed to increase the number of experiences and opportunities for students to develop and reveal their giftedness. The U-STARS~PLUS framework is discussed in greater detail in Chapter 2.

My new approach—the intervention of my study—involved my provision of professional development on U-STARS~PLUS to teachers in School 7 in Table 1 (referred to as Friendship

Elementary subsequently). I gathered data through student assessment of nonverbal ability, classroom observations, and teacher surveys. I administered the nonverbal sections of the Cognitive Abilities Test, seventh edition (NV CogAT) (Lohman & Lakin, 2018) together with the Naglieri Nonverbal Ability Test, third edition (NNAT3), (Naglieri, 2018) to students as pre- and post-intervention measures. I initiated the first testing administration during Phase 2 of my study (to be discussed in detail in Chapter 3) in January 2021. The post-measure took place during Phase 4 during May 2021. These assessments served to benchmark student growth during the time period of my study. In addition, the results of these assessments were compared to the names of students that participating teachers perceived to be gifted at the conclusion of my project.

Focus of Practice Guiding Questions

The following questions guided my project:

1. To what extent will the implementation of the U-STARS~PLUS academic talent development framework impact the representation of Black and Hispanic students within gifted services at Friendship Elementary School in ECCS?
2. To what extent will the NNAT3 paired with the nonverbal sections of the NV CogAT result in the identification of a more demographically representative gifted population?
3. To what extent will changes in teachers' U-STARS~PLUS-informed referrals align with participating students' results on the NNAT3 and NV CogAT?

Background to the Research Questions

Previous research indicated the need to examine both staff attitudes toward gifted students and awareness of gifted behaviors as well as the tools and methods used for

identification (Worrell et al., 2019). As a result of classroom teaching experience, educators construct beliefs and attitudes toward academic giftedness which are rarely examined or discussed (Szymanski et al., 2018). However, teacher recommendations were often the first step or a necessary element of the referral process for gifted identification (Siegle & Powell, 2004).

Overview of Collaboration

The decision to screen and identify a student is a high stakes undertaking that can alter a student's educational trajectory (Coleman, 2016). In my action research for transformation project, I collaborated with the administrators and teachers at Friendship Elementary School to examine the effects of implementing two nonverbal screening tools together with a science-based academic talent development resource. Providing elementary students with high-quality science experiences can allow academic potential to be nurtured and become visible (Harradine et al., 2014). Increasing opportunities-to-learn in this way may lead to more equitable identification practices and results.

Overview of Inquiry

I implemented a mixed-methods approach designed to address my action research for transformation research questions. This approach allowed for the integration of qualitative data obtained from participating teacher surveys and classroom observations with the quantitative data obtained from two standardized measures. The quantitative data from the pre- and post-intervention nonverbal measures of ability were used to measure student growth as well as to provide perspective regarding the extent to which teacher's perceptions of students' academic giftedness change. I conceptualized my project as consisting of a Pilot Study followed by five phases of action research oriented to engendering transformation of a demonstrably inequitable system.

Phase One

Gaining informed consent and establishing baseline data were the primary functions during Phase One of this project (see Appendix B; Appendix E). The participating teacher survey served to gather perceptions of gifted characteristics at the outset of this action research. The data collected in Phase One was compared to participating teacher data following each Plan-Do-Study-Act (PDSA) Cycle in Phase Three and at the conclusion of my project in order to identify at what point in time were the interventions effective.

Phase Two

Student baseline data was collected through the administration of two nonverbal ability instruments. Each participating student had the opportunity to complete the nonverbal sections of the CogAT7 (Lohman & Lakin, 2018) and the NNAT3 (Naglieri, 2018) during Phase Two. These initial performance levels were analyzed at the conclusion of the study to look for increases in student performance and alignment with teacher views regarding which students they would refer for gifted identification. Further, the data from these instruments could be used to modify the identification practices within ECCS in order to identify a more representative population of gifted students.

Phase Three

Phase Three involved three iterations of Plan-Do-Study-Act (PDSA) inquiry cycles. Each phase involved implementing a unit from U-STARS~PLUS, instruction with pattern recognition tasks, observations of classroom practice, and reassessing teacher beliefs regarding characteristics of gifted students.

Participating teachers and I used the framework provided by U-STARS~PLUS to choose and develop standards-based instructional interventions. The science-based learning experiences

of U-STARS~PLUS were implemented within participating classrooms. Teacher perceptions of giftedness and which students they perceived to be gifted was gathered through the U-STARS~PLUS classroom observation protocol (see Appendix F). I also provided participating teachers with pattern recognition tasks for daily instructional use. At the conclusion of the first iteration of Phase Three I asked participating teachers to share their current beliefs regarding gifted characteristics and gathered names of students who they believed show the potential to be academically gifted.

Phase Three continued with two additional iterations where instructional units based on the U-STARS~PLUS framework were implemented. Additional pattern recognition tasks were integrated with classroom instruction by participating teachers. Observation of student behaviors continued to be captured with the U-STARS~PLUS TOPS observation protocol (see Appendix F). At the conclusion of each iteration, I surveyed teachers regarding perceptions of gifted characteristics and collected names of students that teachers believe demonstrate the potential to be academically gifted.

Phase Four

Participating students completed the NV CogAT (Lohman & Lakin, 2018) and NNAT3 (Naglieri, 2018) to provide data which can be compared to the baseline data collected in Phase Two. Participating teachers also shared their current thoughts regarding characteristics they believe indicate potential academic giftedness and the names of student they would currently refer. During this phase, I conducted peer debriefing with each inquiry partner.

Phase Five

During this final phase of my action research, I analyzed data to determine if the additional opportunities-to-learn provided through U-STARS~PLUS and the pattern recognition

tasks were effective in making giftedness more visible to participating teachers in a more diverse population. I additionally analyzed the names of students that participating teachers submitted with student percentiles on the nonverbal assessments to determine if one or both is more likely to identify a diverse population of gifted students.

Inquiry Partners

Collaborative thinking was critical to revealing needs and solutions within my action research for transformation. The planning and Pilot Study time periods involved thought partners from the university level, state department of public instruction, executive leadership from ECCS, several gifted specialists, and content specialists from the district level. As my inquiry progressed, these partners were critical in ensuring alignment with the research questions, integrity in processes, and assisting in identifying themes and ideas to explore. Prolonged engagement with the school staff allowed me to serve as an action researcher who is invested in the school and the students' best interests. This deepened the level of inquiry for this focus of practice.

Throughout the inquiry process, I maintained a research journal. This journal included regular entries which reveal how my thinking, planning, and implementation evolved over the course of my action research for transformation. Identification of points of progress, milestones, concerns, and emerging issues illuminated opportunities for further inquiry. My inquiry journal also served as documentation of ongoing engagement with inquiry partners. The rigor of this dissertation in practice was maintained through prolonged engagement, peer debriefing with collaborative inquiry partners, and member checking (Mertler, 2019).

Conceptual Frameworks

Two conceptual frameworks guided the exploration of this dissertation in practice. Both frameworks emphasized the need to provide students with opportunities to demonstrate their ability to think critically and creatively. These frameworks attempted to make thinking and problem solving visible by placing students in situations where they can demonstrate application of knowledge. Maker's (1996) problem solving framework along with Coleman and Shah-Coltrane's (2010) U-STARS~PLUS instructional framework guided my inquiry.

Problem Solving Framework

Maker (1996) proposed a conceptual framework centered around problem solving. The ability to think creatively and to focus on the solution to a situation or a problem is a key element in viewing giftedness across demographic groups. Gardner (2011) rooted his work in the importance of learning and intelligence centered on finding solutions to authentic problems or challenges. Further, he identified the need to focus on creating effective solutions to these problems.

Advanced abilities in problem solving and the ability to generate novel and useful solutions can be seen across demographic groups in ways that traditional measures of intelligence may not. This strengths-based framework defies deficit thinking (Valencia, 2010). Deficit thinking looks for the challenges within children or within cultural groups. Instead, viewing students as at-potential and observing problem solving traits creates an inclusive framework for identifying giftedness in students.

The framework shown in Figure 5 and established by Maker (1996) put the work of Gardner (2011) into practice by measuring giftedness through the lens of a person's ability to solve problems. This framework reflected the core elements of U-STARS~PLUS. Viewing

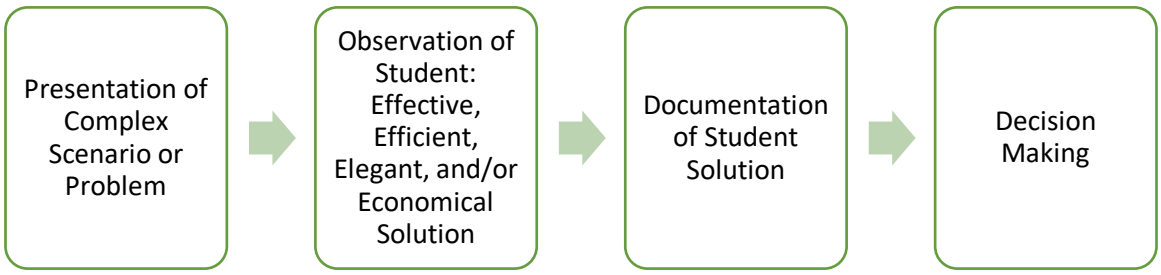


Figure 5. Maker Problem Solving Conceptual Framework.

students in the problem solving and sense making process can reveal academic gifts and talents that might otherwise be difficult to see (Maker, 1996).

U-STARS~PLUS

The second framework (see Figure 6) for my study was based on the U-STARS~PLUS instructional resource (Coleman et al., 2010). U-STARS~PLUS demonstrated effectiveness in focusing the lenses of teachers as well as supporting the recognition of academic potential in students from underrepresented populations (Coleman, 2016; Harradine et al., 2014). This framework leveraged student interest in making sense of their environment by engaging in scientific inquiry through high-end learning opportunities. This framework emphasized viewing students as at-potential and assists teachers, schools, and families in cultivating classrooms where giftedness can be visible.

Definition of Key Terms

These terms related to gifted identification were used throughout the literature and my study. For a shared understanding, the following definitions were used throughout my action research for transformation.

Academic Talent Development - A belief system within gifted education that intelligence can be developed and may not be visible in all students initially or across all areas. An understanding that talent can be domain specific and can be nurtured. An academic talent development model contains three elements: identification of the population, definition of the developmental goals, and the content of the intervention (Gagné, 2015).

Action Research for Transformation - Participatory inquiry where the researcher engages in conversations for change and works closely to understand the current situation with the intent

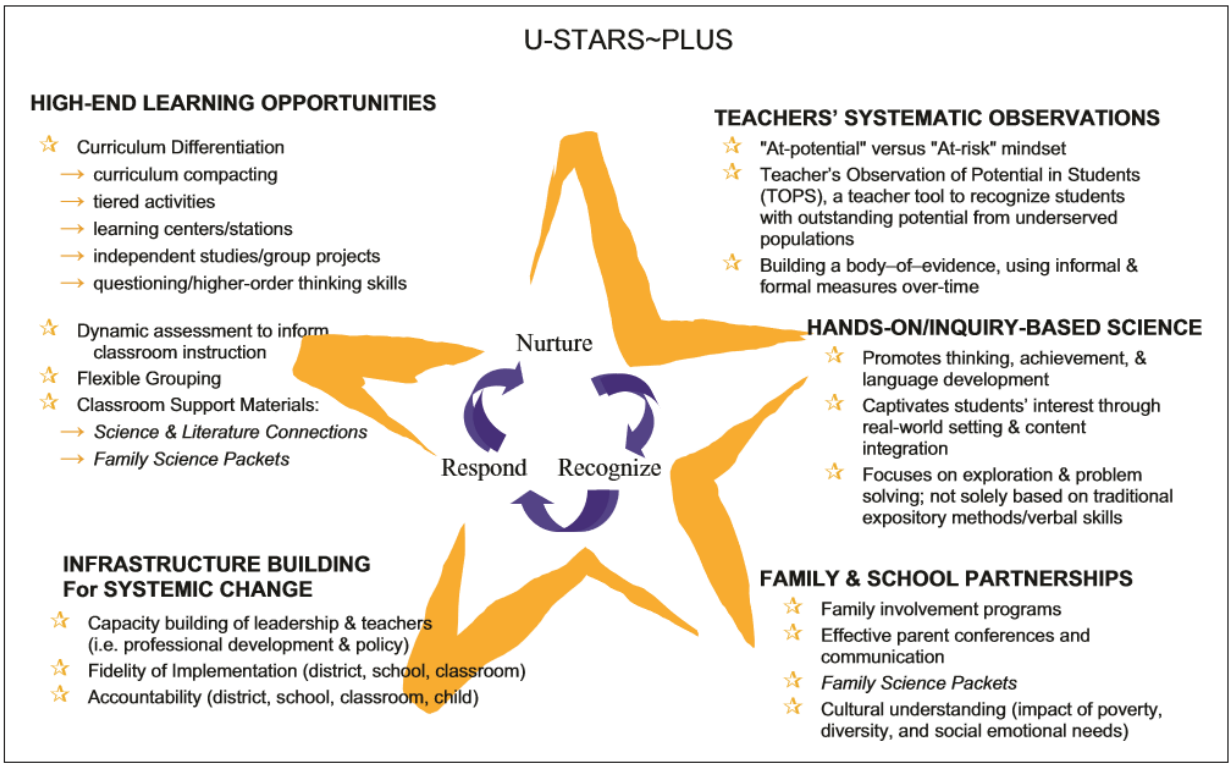


Figure 6. U-STARS~PLUS Framework.

of collaborating with participants in order to make substantive, positive change (Bradbury et al., 2019).

Article 9b - North Carolina legislation related to the instruction of and beliefs about gifted students. In this legislated definition, the North Carolina General Assembly states the belief that students have the ability or potential to perform at high levels when judged against their peers from similar backgrounds. This legislation also requires each local school system to adjust instruction accordingly for these students (North Carolina Academically or Intellectually Gifted Students, 1996/2018).

Deficit Thinking - A mindset that compares one demographic group to others by examining the failings or shortcomings of groups (Valencia, 2010).

Equitable Identification - A measure of the identification of gifted students from various demographic backgrounds where the representation of each group is proportional to their representation in the overall population (Plucker & Peters, 2017).

Excellence Gap - Differences of subgroups of students who are performing at the highest levels of achievement (Plucker & Peters, 2017).

Nonverbal Measure - A measure of general intelligence or ability with tests that do not require domain specific knowledge (Naglieri & Ford, 2015).

Opportunity-to-Learn (OtL) - The formal and informal experiences to which an individual has exposure (Plucker & Peters, 2017).

Universal Sweep Screen - The act of administering an assessment to an entire grade level or population (Card & Giuliano, 2016),

Assumptions

One assumption made for my study was that academic giftedness occurs equally across all demographic backgrounds. While there may be underlying factors which make academic giftedness more difficult to identify, I made the assumption with my study that academic giftedness occurs equally across all demographic groups. A related assumption was that giftedness can be identified in all populations given the correct measurement tool and through experiences provided to students. Finally, I assumed that if a student lacks opportunities-to-learn, this can be overcome through interventions.

An assumption regarding teachers was that given tools that will better develop and reveal giftedness, these educators would use this information to screen and serve students from all backgrounds. For the sake of my study, it was assumed that educators act in the best interest of all students when educators are equipped with knowledge, skills, and abilities. It was assumed that the teachers and administrators involved in my study will work in collaboration with the researcher and gifted services staff members to implement the proposed interventions with fidelity.

An additional assumption was that participants in this study believe in the concept of academic giftedness and that there was a reason to identify giftedness in students. It was assumed that a designation of gifted has a positive impact on a student's education. As a result of gifted identification, students receive instruction and access to learning that is in alignment with their academic, social, and emotional needs. It was assumed that these long-term implications are positive and lead to better outcomes for students.

Scope and Delimitations

My inquiry was limited in scope based upon several factors. My study focused on one elementary site within a mid-sized, suburban, and diverse school in ECCS. Participating teachers and students involved were those who provided informed consent for participation. Although the selected site has similar demographics to many other elementary sites across ECCS and many schools in the state, the scope may be limited due to the backgrounds of the students in the school's unique attributes.

Due to COVID-19 there were unique impacts on my action research. Students transitioned to remote learning to conclude the school year preceding my study. During remote learning, all instruction was conducted virtually and likely created more opportunity gaps for students without reliable Internet access or support. During the study year for this project, students began the school year on a schedule where they attended school face-to-face two days a week and continued with remote learning the remaining three days. This may have had impacts on student learning and possibly on the implementation of my inquiry. Even with the uniqueness of this site and this time period, my study and my data were not unduly affected as I am working with teachers and students that are typical for our district and region.

This focus of practice was chosen due to the pervasive and lasting under-representation of Black and Hispanic students within gifted services in ECCS. A limited number of opportunities-to-learn combined with a lack of teacher professional development related to gifted education are believed to contribute to the current condition. When students are left out of gifted services, academic gaps are exacerbated.

Limitations

One potential bias or confounding variable that I brought to this study was I was a member of the gifted services staff in ECCS and had a desire to find a solution to the concerns related to under-representation. It was possible that I brought unrecognized biases and mindsets into this action research. In order to address these, I requested that fellow inquiry team members serve as reviewers of the collected data and my findings.

I was also a member of the ECCS district leadership staff. Although I did not have evaluative influence over specialists and teachers, I did have positional authority. This could have influenced the responses from participating teachers. In order to confront this, clear disclosure of the study was be shared, and anonymity of responses was maintained where practicable. Responses and notes were coded to protect participant confidentiality and to encourage honest feedback.

The internal validity of my study may have been threatened by confounding variables found in a public-school setting. These included teacher and gifted specialist experience, teacher and gifted specialist efficacy, previous gifted service delivery experiences, bias of participants, structure of the school day, and student experiences in and out of the school setting. While I could control for some of these variables through study design, not all variables could be identified or controlled.

External validity of this study was threatened due to the setting of the school system. ECCS was a school district that experiences a large amount of teacher and student transiency. This created a less experienced teaching staff than the state average. Students moved within as well as into the district resulting in a single student having multiple school experiences. In addition, my study focused on one low-income elementary school with a gifted population that

lacks representative diversity for Black and Hispanic students. The ability to generalize the data and findings from my study was limited to similar size districts with transient populations at the elementary level.

Significance of Inquiry

The primary purpose of my action research was to advance practices within gifted services in ECCS. At the start of my study, there was an equitable identification gap within gifted services which effectively shuts out certain groups of students from access to gifted services. My study aimed to clarify if the issue was rooted in identification practices within the school system or in opportunities-to-learn for students.

Potential Impact on Identification Practices

Identification practices included a general review of student data, recommendations from teachers or parents, and screening utilizing the Iowa Assessments (Iowa Testing Services, 2017) and the Cognitive Abilities Test (Lohman & Lakin, 2018). There were no universal sweep screening instruments being utilized. Part of the reluctance to use such a sweep screening tool was the amount of time and cost associated with administering a large assessment. Within my study, the use of a shorter, nonverbal assessment will be explored. The results would reveal if a broader, more representative pool of students would be included in gifted services. If found to be effective, these tools with lower cost and time requirements might be palatable for the district and meet the current need.

Screening was one aspect being explored while opportunities-to-learn was another angle examined. Opportunities-to-learn are not typically equitably distributed across groups of students. These opportunities-to-learn include those which occur in the home, at school, and through enrichment and after school activities. My study sought to examine the impact of

implementing a framework provided by U-STARS~PLUS. This framework provided teachers and gifted specialists with specific, science-oriented learning tasks which make critical thinking and reasoning processes of students more visible. By making thinking more visible in non-traditional tasks, teachers and specialists might be better able to identify a talent pool for gifted services. In addition, students receive more opportunities-to-learn.

Combining Screening with Opportunities-to-Learn

By addressing this focus of practice from two angles, my study did what few other investigations have done before. That is, in one elementary school site this study will seek to determine if one or both approaches, sweep screening or instructional intervention, created a more diverse and representative pool of gifted students.

Impact on Action Research Partners

There were many stakeholders involved in this project. My action research for transformation created the opportunity to increase the awareness of teachers, administrators, and gifted specialists. Teachers may have been aware of the capacity of their students and aware that giftedness is not always visible or visible in the same way in different groups of students. Teachers may have gained a greater respect the role that gifted services plays in the overall educational experience of gifted students. Additionally, better equipping school leaders to see giftedness in all populations could result in school schedules that are constructed to allow time for additional opportunities-to-learn for students and universal screening.

My study sought to significantly impact the practice of gifted specialists related to screening, services, and identification. Implementing an academic talent development framework such as U-STARS~PLUS required gifted specialists to view the time investment as valuable. Exposing gifted specialists to new practices and new resources helped them with current students

as well as with their future practice. The specialists involved in my study experienced first-hand knowledge of the practices employed and were able to be voices to their colleagues to impact students across ECCS.

Potential Impact on Professional Literature

My study sought to add to the professional literature surrounding gifted education in elementary schools. Leaders in gifted education in the state of North Carolina as well as across the nation were looking to find solutions that are both meaningful and significant for students who are deserving but not included in gifted services. The current literature in gifted education revealed a number of meaningful studies and impactful practices. However, few studies examined the combined impact of sweep screening utilizing a nonverbal measure with increased opportunities-to-learn in the early elementary grades. Combining these two approaches which are both generally considered to have positive impacts, my study examined if these two tools used together were able to identify a more accurate and more diverse gifted population in the elementary years.

Within ECCS, my action research resulted in a collaborative effort to establish a new framework for academic talent development and gifted identification. Addressing the current concern regarding underrepresentation helped guide leaders and teachers in growing a more inclusive program for gifted services in ECCS. Further, my study provided greater credibility to future budget requests as it relates to sweep screening of students, allocation of gifted specialists, and teacher professional learning. The results of my study were shared with district leadership as well as school-based leadership to make data driven decisions which benefit all students, but especially gifted students.

Advancing Equity and Social Justice

Equity in gifted education was critical and central to my action research for transformation. Access to gifted education connects student learning needs with appropriate learning experiences. By failing to make this connection and to provide access to appropriate learning for all gifted students, the future opportunities of students are diminished. When a subgroup of students is disproportionately left out of learning opportunities, we increased the opportunity gap.

By creating more equitable processes and increasing opportunities-to-learn for deserving students, the current educational opportunity gaps could be narrowed or closed. Social justice requires us to explore and react to each area where we fail to meet students. By providing more opportunities to access gifted education to a more accurate and representative population, we are addressing a social inequality and being more just in our practice.

Advances in Practice

My focus of practice was specifically designed to address an area of concern within ECCS. The interventions studied through this inquiry allowed the school system to establish a framework for screening and identification of gifted students that results in a more equitable identified population. Additionally, the methods explored in this inquiry allowed the school system to establish professional learning resources and curriculum which can be provided to more elementary sites across the County. Further, effective interventions and processes studied can be shared through professional networks within the state and perhaps even further. This inquiry had the potential to guide gifted professional practices within and beyond ECCS.

Summary

Despite a long and well-intentioned approach to gifted services in ECCS, equity issues remained. The gifted services team across ECCS and I were acutely aware that lack of access to services was a worthy problem to address through a carefully studied action research approach. Understanding underlying issues and barriers to equitable identification could have immediate and long-lasting impacts for ECCS.

Researchers identified both opportunities-to-learn and methods of testing as systemic barriers which the district and school educational community has the ability to change (Briggs et al., 2008; Clarenbach, 2015; Hodges et al., 2018; Rollins et al., 2009; Worrell et al., 2019). My study addressed both the issues of opportunities-to-learn within the school setting and the types of assessment administered to all students within two grade levels.

Ultimately, my action research for transformation was designed to determine effective practices to achieve proportional representation within the gifted population across the elementary setting. The results of my study can establish a framework to guide selection of instructional interventions, hiring of gifted services staff, development of professional learning for classroom teachers, and expectations for services for students identified as well as those who may not yet be identified. As Coleman (2016) outlined, decisions related to gifted identification can have long-lasting impacts on a student's educational path. In the next chapter, I provide a thorough review of the definitions of giftedness, current challenges for gifted education, and the promise of uncovering student potential.

CHAPTER 2: REVIEW OF LITERATURE

The overarching aim of my focus of practice was to provide equitable access to gifted identification for elementary students through a new framework. This collaborative action research for transformation began by engaging with school-based partners to design and implement additional opportunities-to-learn and to explore the impact of administering nonverbal ability assessments to students. The careful examination of the impact of multiple plan-do-study-act cycles resulted in recommendations for future practice related to the identification of a more diverse population of gifted students.

Current definitions of giftedness in North Carolina and across the country (NAGC, 2019; North Carolina Academically or Intellectually Gifted Students, 1996/2018) place a call to action to practitioners to consider giftedness across all demographics and to consider the life experiences when screening for giftedness. Based on these definitions, responsible practitioners should consider that giftedness may be masked by a number of factors including unequal opportunities-to-learn (Harradine et al., 2014). However, the current gifted identification system is problematic, and implementing a system that is designed to increase the opportunities for children from historically underrepresented demographics is the most reasonable and just way to close excellence gaps (Plucker & Peters, 2017).

Across ECCS, students were disproportionately being left out of gifted services. This was especially true for Black and Hispanic students. When calculating the raw differential representation (Curran, 2020; Girvan et al., 2019) values for these two groups across ECCS, nearly 73 Black students and 43 Hispanic students were overlooked (see Table 1, Chapter 1). The current identification practices required reexamination and careful study to provide students with the access to identification and services they deserve. Students from culturally diverse

backgrounds are missing educational opportunities matched to their abilities (Briggs et al., 2008; Davis, 2010) which creates the ideal environment for action research for transformation through my focus of practice.

Throughout this chapter, I reviewed the literature addressing four major areas related to this focus of practice. First, I shared the conceptual frameworks guiding my work. Second, I examined the literature to review the history of gifted education and to support a current and informed definition of gifted education. Third, I provided evidence from the literature related to the challenges for gifted education explored in this focus of practice. More detailed attention will be provided to equitable access and underrepresented gifted populations. Finally, in the fourth section, I spotlighted efforts to uncover student potential and support the decisions for utilizing the interventions proposed in this action research. Figure 7 provides a visual depiction of the order in which relevant contexts will be discussed.

Theoretical Frameworks

Two primary theoretical frameworks created by Renzulli (1978) and Gagné (2007) provided the foundation for the work explored in this focus of practice. These two frameworks are also recognized by the National Association for Gifted Children (NAGC, 2020) as cornerstones of their work. Both frameworks highlight the belief that giftedness is present equally across all demographics and that experiences shape the manifestation of giftedness.

Renzulli's Concept of Giftedness

Renzulli's (1978) theory of giftedness was based on his Three Ring Conception of Giftedness. This initial concept has remained throughout the continual development of his theory over the years. Figure 8 shows the current conceptual framework which added the Enrichment Triad Model, Operation Houndstooth (Social Capital), and Executive Functions to the

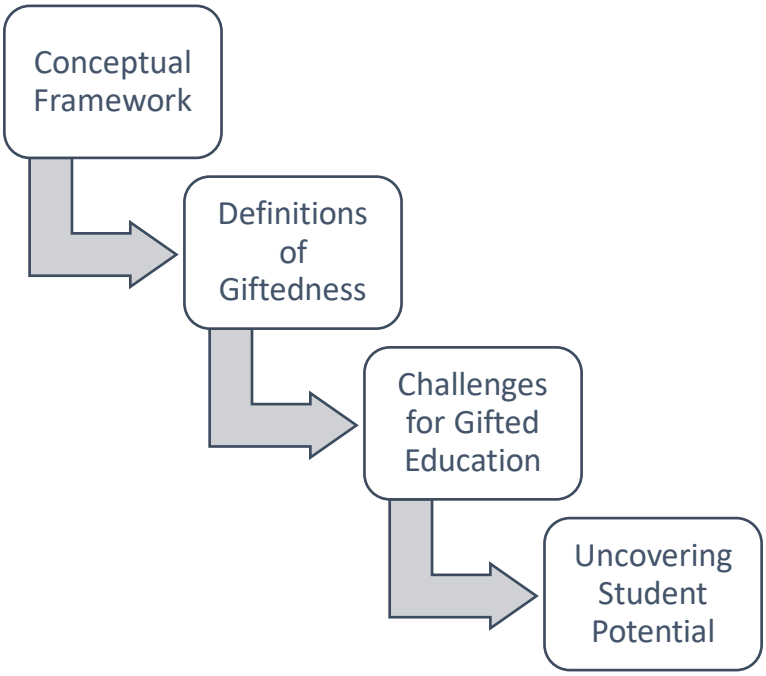
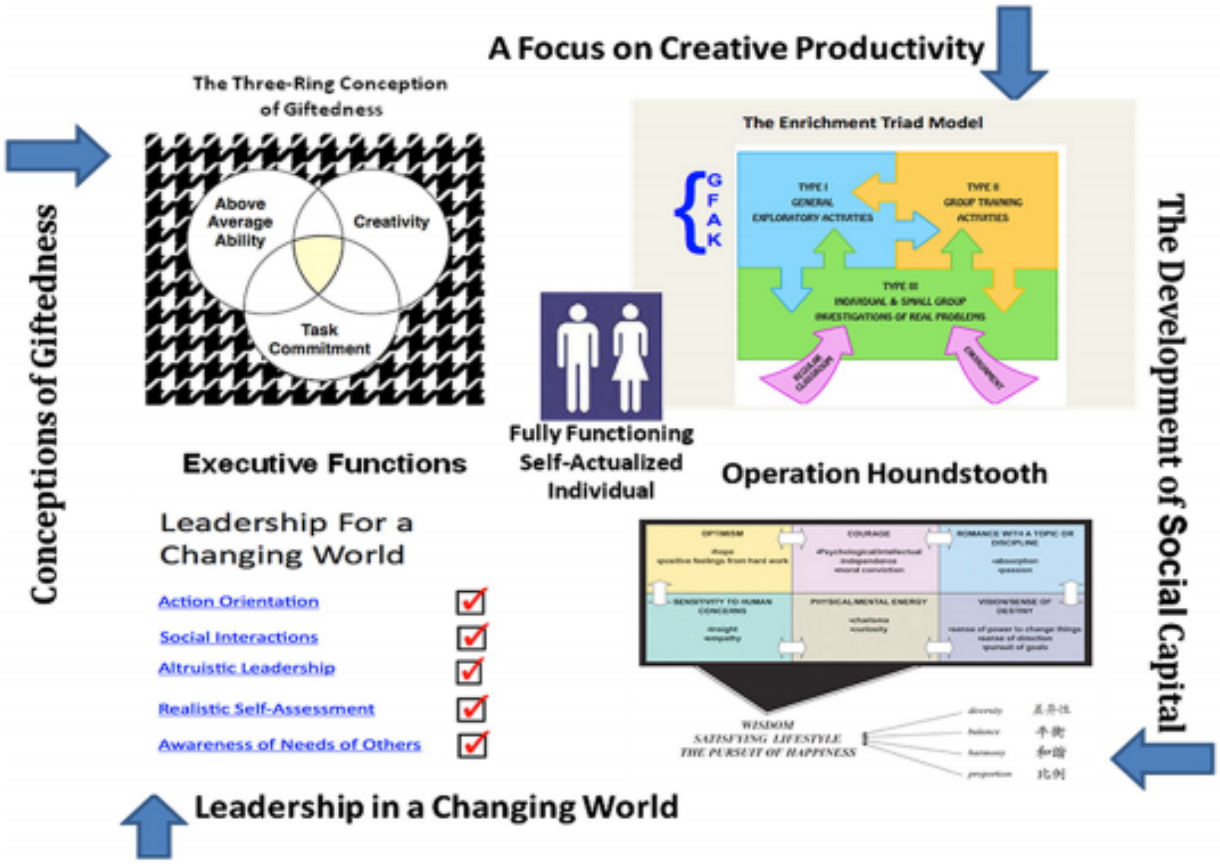


Figure 7. Major components of this review of the literature.



Note. Reprinted from "Reexamining the role of gifted education and talent development for the 21st century: A four-part theoretical approach," by Renzulli, J., 2012, *Gifted Child Quarterly*, *56*(3), p. 152.

Figure 8. Renzulli's Four Part Theory of Talent Development.

original idea (Renzulli, 2012). The Three Ring Conception of Giftedness stated that giftedness occurs at the intersection of task commitment, above average ability, and elevated levels of creativity. Each of these was an attribute that can be natural or developed. Renzulli went further to share that these attributes do not have to happen at all times, in all places, or in all people.

In his more recent research, Renzulli (2012) shared that he looked to expand his conceptual framework to include executive function. Being gifted was not just about the academic side of the person and with this addition the following topics are being studied by Renzulli: openness, consciousness, extraversion, agreeableness, and neuroticism. This continued evolution of thought expands the perception of giftedness and the direction of gifted education.

Gagné's Concept of Giftedness

Gagné (2015) proposed a talent development model originally referred to as the "Differentiating Model of Giftedness and Talent." In this model the role of innate ability is emphasized, but in coordination with what he referred to as environmental press. The environmental press are all the factors that lead to the enhancement or refinement of knowledge or skill. Gagné also emphasized the importance of commitment to growth. For Gagné, the top 10% in natural abilities and the top 10% in developed skills should be viewed as gifted.

Gagné's (2015) academic talent development model required that the target population is identified, the developmental goals of the program are clarified, and the content of the intervention is clear. Further, Gagné identified seven key elements for a highly effective academic talent development model: an enriched K-12 curriculum, daily enrichment, ability grouping, accelerated pacing, personal goals, highly selective access, and early interventions.

An Overview of Giftedness

Giftedness has a long and evolutionary history full of influential philosophers and educators. A brief overview of the history of gifted education revealed a gradual change from an exclusionary, superior view of to a view that giftedness appears across all demographics and often needs to be developed. An overview of giftedness also required an examination of the various definitions of what it means to be gifted. A brief exploration of gifted definitions from the national, state, and local level set the stage for where this action research begins.

History of Gifted Education

The identification, support, and nurturing of students with high intellect and potential has been an often unspoken aim in the field of education for many years in the United States. However, the field of gifted education in the United States exhibits considerable variance regarding how students were identified for that support and nurturing. The national organization focused on gifted education in the United States in the National Association for Gifted Children (NAGC).

Early American Education Views on Gifted Education

A number of models of giftedness have emerged over the years. Giftedness was originally viewed as a function of intellectual ability as indicated by an individual exhibiting a high intelligence quotient (IQ). Terman (1925) and Terman and Oden (1959) performed some of the earliest research in the literature and proposed that students with IQs above 140 were to be considered gifted. During the 1960s and early 1970s, little changed in the popular views of giftedness.

Stanley (1976) established what has guided a great deal of gifted identification practices by advancing the view known as the talent search. In this approach, exceptionality was

determined by being in the top one percent in mathematical and verbal ability. This restrictive view of giftedness which echoed the beliefs of some of the earliest views of Terman (1925) allows for extreme levels of acceleration and service with minimal investment. However, the exclusionary nature leaves many out who are also well above the norm.

Transition to Renzulli's View of Giftedness

A significantly different view of giftedness was brought to the field by Renzulli (Rimm et al., 2018). Perhaps one of the most prolific writers and researchers in gifted education over the past 40 years, Renzulli introduced the Enrichment Triad Model in 1977 and the Three Ring Conception of Giftedness followed in 1978 (Renzulli, 1978; Renzulli, 1999). Renzulli emphasized that giftedness should be viewed both in an academic or schoolhouse manner as well as from a creative, productive angle. One of the most influential and commonly used instructional processes developed from this work was curriculum compacting (Reis & Renzulli, 1992; Reis et al., 1998). Compacting the curriculum allowed for adjusting the pace and content that advanced learners had access to learn. In the 1980s, Renzulli expanded talent development and the reach of enrichment to all students through the Schoolwide Enrichment Model. This new broad approach to adjusting instruction and experiences for all students honored the idea that not all students are reached through gifted services (Renzulli, 1999).

This change in mindset related to giftedness developed from the standpoint that many gifts need to be cultivated over time. Gifts are developed based upon learning, environmental factors, and experiences in collaboration with natural ability. Renzulli's theories emphasized the importance of motivation and were applicable to academic and non-academic ventures (Worrell et al., 2019). Sternberg and Davidson (2005) identified Renzulli's enrichment triad model as the most common model for conceptualizing giftedness in the United States over the past forty

years. Renzulli's (1978) version of talent development changed the long-held belief that high scores were the key to identifying giftedness. Instead, Renzulli proposed the intersection of three key areas: task commitment; creativity; and above-average ability. This reconceptualization of giftedness brought the opportunity for giftedness to be viewed as malleable.

Continued Evolution of Gifted History

Sternberg and Clinkenbeard (1994) continued to expand and elaborate on views of gifted intelligence and identification. The resulting Triarchic Theory of Gifted Intelligence incorporated an individual's ability to learn new information, develop creative solutions, and apply solutions to common problems as lenses on intelligence. Figure 9 outlines this view on intelligence. This view casted a broader net and sought to better match services with identification. Sternberg and Clinkenbeard (1994) acknowledged the need to match identification of students with the instruction they receive and ultimately with how they are evaluated.

Current Definitions of Giftedness

Gifted identification is generally divided into two categories. One area worked to identify students who are already exemplifying the desired behaviors of high academic prowess. The other area focused on the potential of students and the desire to develop potential into visible giftedness (Hodges et al., 2018; McKenzie, 1986). Potential and ability can both be hidden from a teacher's view (Briggs et al., 2008). A traditional view of a gifted child might hold that she was a high achiever who had also credentialed herself through exceptional standardized testing scores. These characteristics often associated with a gifted child could be concealed by a lack of experience and exposure. The result could be that a child is neither identified nor developed academically. Thereby extending gaps in both identification and performance.

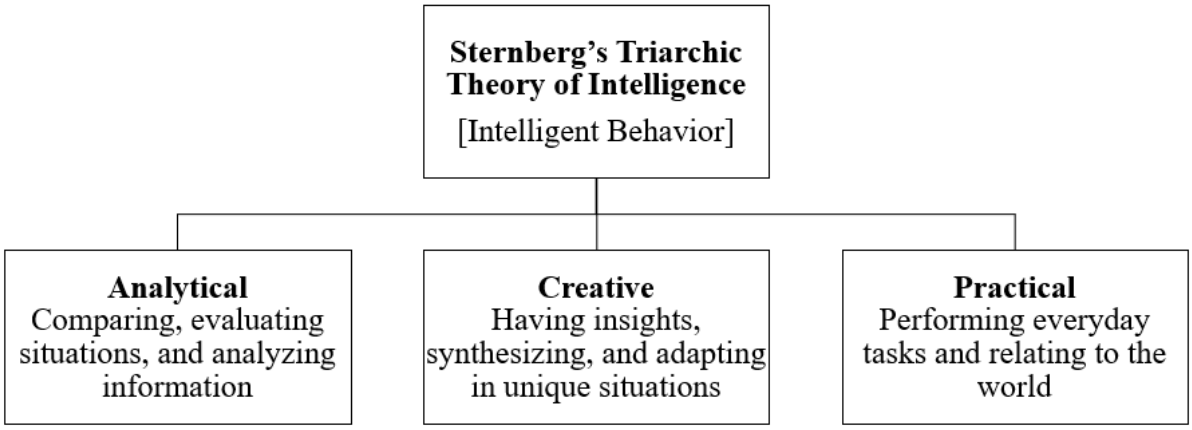


Figure 9. Sternberg and Davidson's (2005) Triarchic Theory of Intelligence.

National Level: NAGC

NAGC (2019) shared a position statement which included the key principles of their definition of giftedness. The definition is inclusive of students from all backgrounds who can, or could, perform at more advanced levels than their peers in one or more areas. Additionally, NAGC stated that these individuals require modifications to their learning in order to grow and achieve their potential. Those with special needs were not exempt from being gifted. It was possible for a person to be twice-exceptional. NAGC recognized the person's needs beyond academics to include social and emotional development and that all needs may change over time and based on situations.

State Level: North Carolina Department of Public Instruction

North Carolina defined gifted students as children who "perform or show the potential to perform at substantially high levels of accomplishment when compared with other of their age, experience, or environment" (North Carolina Academically or Intellectually Gifted Students, 1996/2018). Strategic planning for gifted programming in North Carolina was framed by the six program standards: student identification, comprehensive programming within a total school community, differentiated curriculum and instruction, partnerships, and program accountability. Each program standard guided local education agencies (LEA) in determining how to identify and provide services to gifted students. Each LEA must respond to each program and practice in order to lay out a public plan for how services will be delivered.

Local Level: ECCS

At the local level, ECCS defined giftedness under the guidance from the North Carolina Department of Public Instruction. ECCS sought to identify and serve students from all

backgrounds, in all settings, based on student needs. Programs and services were developed and maintained within the limitations of funding and personnel.

Summary of the History and Definitions of Gifted Education

Definitions of giftedness have evolved over time and are now generally more comprehensive and inclusive. While the appropriate percentage or number of students that should be included may vary, each current definition believed that giftedness occurs across all demographic categories and recognizes that giftedness may be more difficult to identify within certain populations. This challenge to find and serve gifted students is the focus of the next section.

Challenges for Gifted Education

In addition to the typical challenges facing the school systems, teachers, and students, gifted education faced some unique challenges. Funding, excellence gaps, the perception of giftedness, and underrepresentation of minorities each were significant issues facing gifted education. Examining each of these issues was critical in order to identify solutions and to find partners who can support the cause of gifted education.

Gifted Funding

Gifted education has typically been one of the least funded elements within public schools. Other than Javits grants, there was no designated funding from the national level for gifted education. Financial data from Baker and McIntire (2003) and more recently the State of the States report (NAGC, 2015) revealed no changes in trends. Due to lack of funds, some districts had little to no support for students or teachers related to gifted services. Funding was just one of the challenges facing gifted education. However, a lack of funding may be one of the causes of the next issue with gifted education, excellence gaps.

Excellence Gaps

Plucker et al. (2017) proposed that one of the causes of excellence gaps is the low financial investment that is made on creating additional opportunities-to-learn for students. Students have a wide array of outside of school experiences beginning at birth and continuing throughout their elementary and secondary schooling years. Failing to provide these opportunities within school only widens the excellence gap (Plucker & Peters, 2017).

When students from certain backgrounds are overlooked for gifted identification, they miss out on services and opportunities-to-learn. In many cases these are the same students who have already come to school with fewer accumulated advantages (Plucker & Peters, 2017). At the same time, the focus under many state accountability systems was minimum proficiency. Therefore, there are few incentives to encourage, or fund, additional higher-level learning experiences. Plucker and Peters (2017) contend that this led to an increase in excellence gaps as those who are identified, disproportionately White, received even more support. While it may be tempting to think that the gifted service was the problem, removing gifted services does not remedy the situation. Correcting the underrepresentation caused by identification practices was the solution to lift all students (Davis, 2010; Neff et al., 2017; Peters et al., 2014; Plucker & Peters, 2017; Siegle et al., 2016).

The solution proposed by Plucker et al. (2017) required partnership and focus at the classroom, school, and policy level. Within the classroom, opportunities needed to be made both clear and accessible. At the school level, the focus must be on universal screening with local norms (school level if possible), ability grouping, and professional learning. The policy level was what makes the other levels possible. Policies needed to be adjusted around accountability, training, and access to opportunities. The cornerstone of this work was frontloading or preparing

students before students are identified or before they enter advanced coursework (Briggs et al., 2008; Steenbergen-Hu et al., 2016). Providing students with both rigor and support was critical.

Underrepresentation

Equitable access to resources and services matched to a student's needs had both moral and economic implications (Hodges et al., 2018). Changing American demographics along with disproportional identification of giftedness created an inequity that has and will continue to result in fewer citizens reaching their full potentials. By failing to meet students where they are academically school systems lowered students' opportunities. Students who failed to reach their potential result in missed personal and economic opportunities for our society. Families who are unaware of opportunities were unable to access these very resources that they need in order to grow. Davis (2010) confirmed there are communities who have been left out of communication and therefore they do not access the resources and benefits connected to gifted services.

The problem of underrepresentation was especially prevalent for Black and Hispanic children (Ford & King, 2014). Ford (2013) proposed a Relative Difference in Composition Index (RDCI). This formula compares the percent of demographic group to the percent of the same group in general education. Based upon this formula, Black students were underrepresented by 47% nationally in gifted services. Further, thirteen states had underrepresentation of greater than 50%. This indicated a pervasive and persistent problem which is leading to a lack of opportunities for students. As the demographic make-up of America has becoming increasingly diverse, the make-up of the identified gifted population has not reflected this change.

Quantifying the Problem

Girvan et al. (2019) established and Curran (2020) elaborated upon addition metrics to quantify the challenges of underrepresentation. The Risk Ratio (RR) compared the ratio within a

subgroup (Black or Hispanic for the focus of this action research) to the ratio identified within the dominant culture (White). This figure was found by dividing the two ratios resulting in the RR. As the RR is the risk for being identified, a perfect correlation would be found when RR has a value of 1.0. Similar calculations, described previously in Chapter 1, allowed for the quantification of how likely a student is to be identified as gifted and how many students are estimated to be overlooked.

Uncovering hidden potential in students was a challenge that all forms of gifted identification face. The decision to formally label a child as academically gifted typically included three phases: screening, evaluation, and determination (Cramond, 1997). The screening phase created a talent pool by searching for students to include in the evaluation phase. Evaluation typically included offering several assessments and gathering of supporting data. Based upon this collection of data a determination was made regarding identifying a child as academically gifted. Screening at an early age should focus on a child's potential (McClain & Pfeiffer, 2012).

Screening was a critical element as some educators can seek to exclude students rather than seeing students as at-potential (Harradine et al., 2014). The reliability of teacher nominations to screen students has been shown to be limited unless significant professional development is part of teacher preparation (Vreys et al., 2018).

Equitable Access

McFadden v. Board of Education for Illinois School District U-46 (2013) established that schools must meet or work toward minimal goals of equitable services. Attaining a perfect proportion of equity may not be feasible in an ever-changing educational landscape. Therefore, Ford (2015) proposed an equity formula that equates to a goal of being within 20% of equitable

representation. This calculation indicated if the level of under-representation is within reasonable limits. Ford and King (2014) suggested that in approximately 16,000 districts across the United States, Black and Hispanic students were under-represented. The equity equation allowed districts to set goals, have meaningful conversations, and develop shared plans of action.

Summary of Challenges for Gifted Education

Gaps within gifted education have both visible and invisible consequences (Plucker et al., 2017). If gifted education cannot reach all gifted students or make meaningful strides, questions regarding the need for these services will grow. When students from specific backgrounds are left out in predictable ways, questions regarding the integrity of the process of identification will only grow. According to Davis (2010), school systems should establish structures which look at all students, inform all families and communities of opportunities for identification, and ensure that instruction is culturally responsive in all classrooms. Implementing any one structure may be beneficial, but the three together have a greater probability of promoting equitable access. A growing area within gifted education focused on developing and uncovering student potential. This concentration brought strategies for improvement to those who are currently overlooked.

Uncovering Student Potential

Siegle et al. (2016) pointed to the importance of a multi-faceted approach to finding and serving gifted students. Too often students were overlooked when a single approach is implemented. While universal screening had been advocated for as necessary (Card & Giuliano, 2016; Carmen et al., 2018; Lohman, 2005; Naglieri & Ford, 2005) alone it is not sufficient (Siegle et al., 2016). While gifted potential may be just below the surface for some students, for others it will require more opportunities to emerge.

When considering potential and giftedness Lohman (2005) cautioned educators to reconceptualize the idea of potential. Academic potential was thought of as a trait that is deeply hidden and must be coaxed out of a learner by some. Instead, gifted educators should think of potential as a level of readiness to acquire knowledge and grow (Harradine et al., 2014). Viewing students from a strengths-based perspective allowed them to experience learning environments that engage and grow them. Coleman (2016) developed the U-STARS~PLUS (Using Science Talents, and Abilities to Recognize Students~ Promoting Learning for Underrepresented Students) framework in order to equip teachers of primary age students, kindergarten through third grade, with the knowledge, mindsets, and tools needed to better reveal giftedness. Teachers trained with the U-STARS~PLUS framework have shown a greater ability to recognize students with gifted potential from underrepresented populations (Coleman, 2016; Harradine et al., 2014; Kern, 2009).

Potential can be overshadowed by a perceived lack of student motivation. Motivation was a key component of the three-ring conception of giftedness related to task commitment (Renzulli, 1978; Renzulli, 1988; Renzulli, 2012). Motivation comes with awareness of opportunities and access to resources to learn more about those opportunities. Students who are never exposed to a topic will not be able to express their intense interest and thus go unseen. Housand and Housand (2012) identified motivation, control and autonomy, challenge, cooperation, curiosity, recognition, and competition as factors that have historically been shown to increase motivation. Further, they pointed to the opportunity the access to provide these motivators through technology. The ability to encourage and to provide the setting where engaging learning topics were available was yet another example of access to opportunities-to-learn.

Universal Sweep Screening

Administering an assessment to all students provides information regarding the potential and achievement of each student. Universal, or sweep screening is a process which allows all students to examine through a common lens (Card & Giuliano, 2016). According to Davis (2010), this strategy mitigated the bias and challenges associate with teacher referrals for gifted programming. Teacher referrals are based on many factors including knowledge of gifted behaviors, biases connected to certain populations, exposure to professional learning, experience in the profession, personal experience with gifted programming, belief systems, and expectations (Ford, 2013).

Card and Giuliano (2016) found that a universal screening process resulted in a 174% increase in identification of students from low-income backgrounds as well as a 118% increase in identification of Hispanic and a 74% increase for Black students. The ability to use as many measures as possible to discover giftedness in children and to use nonverbal testing as part of the process must be embraced as an indicator of giftedness (Funk, 2009). Siegle et al. (2016) found that universal screening when combined with modifications has the greatest impact. Some examples of the effective modifications included giving universal screening tests in multiple languages, using nonverbal tests, implementing more flexible scoring, weighting criteria differently, or establishing different cutoff scores.

Making Student Potential Visible

For a student's potential to be visible all effective lenses must be worn. The use of nonverbal assessments was believed to show promise in seeing gifts giftedness in a more diverse population (Briggs et al., 2008; Callahan et al., 2017; Card & Giuliano, 2016; Wai & Lakin, 2020). While a student may not yet demonstrate achievement in classwork or on a formal

assessment, the ability to problem solve and recognize patterns at an advanced level can be an indicator of giftedness.

Siegle et al. (2016) stated that talent development requires two steps. First, schools must provide opportunities for talent to surface. Students must be given environments and situations where their talent can be seen and noticed. Second, schools much provide programs to develop students' talents. With these two elements in place, students who are ready to express their gifts are able to do so and those who need opportunities to develop are afforded that as well. The use of academic talent development and gifted screening resources such as U-STARS~PLUS have been shown to make giftedness more visible in diverse populations.

Nonverbal Measures of Ability

The CogAT7 (Lohman & Lakin, 2018) and the Naglieri Nonverbal Ability Test (NNAT3) (Naglieri, 2018) predict student aptitude by measuring student fluency with reasoning abilities (Alodat & Zumberg, 2019). The use of shapes, figures, and objects required children to engage both deductive and inductive thinking (Naglieri & Ford, 2015). Nonverbal assessments have been shown to be more sensitive to revealing giftedness in students in several studies (Cao et al., 2017; Card & Giuliano, 2016; Ford, 2015; Giessman et al., 2013; Lohman, 2005; Naglieri & Ford, 2015; Wai & Lakin, 2020). However, Carman et al. (2020) found in a study of over 200,000 kindergarten students that these measures alone were not sufficient to achieve proportional representation of gifted students.

Cognitive Abilities Test (CogAT). The CogAT (Lohman & Lakin, 2018) was comprised of three batteries: verbal, quantitative, and nonverbal. Each battery was divided into three subtests. Students had 10 minutes to complete each subtest. Each subtest had between 16 and 20 items. The entire CogAT could be completed in 90 minutes (with additional time for reading

directions). Sections are seen in Table 2. For the purposes of this action research, the focus will be on the nonverbal battery of the seventh edition of the CogAT. From here forward, this will be referred to as the NV CogAT.

The Cognitive Abilities Test (CogAT) (Lohman & Lakin, 2018) had been used in many grades and was considered one of the most commonly used instruments in the United States (Carman et al., 2018). According to Lohman (2012), the CogAT (Lohman & Lakin, 2018) seeks to measure students' reasoning skills as a discriminating variable to determine giftedness. The CogAT offered three sub-tests which are nonverbal in nature.

Naglieri Nonverbal Ability Test (NNAT). The third edition of the NNAT (Naglieri, 2018) was used for this action research and will be referred to as the NNAT3 from this point forward. The NNAT3 is a language-free assessment of ability. Unlike the CogAT7, there was no verbal or quantitative battery. There were 38 items of four types on the assessment: pattern completion, reasoning by analogy, serial reasoning, and spatial visualization. The full assessment could be administered in 30 minutes.

Academic Talent Development: U-STARS~PLUS

Cultivating and growing potential in all students has been a primary goal of education. Gifted students or those who may have the potential to be gifted deserve opportunities to develop pre-emergent or emergent academic gifts (Coleman, 2016; Gagné, 2007; Gagné, 2015; Gardner, 2011; Renzulli, 2012; Rollins et al., 2009; Valencia, 2010). By providing students with support and exposure to problem-based learning experiences such as U-STARS~PLUS, the gifts of students from diverse backgrounds are more likely to be developed (Coleman, 2016). In a meta-analysis Hodges et al. (2018) proposed that academic talent development initiatives for children as a part of the solution for underrepresentation.

Table 2

Structure of Cognitive Abilities Test, 7th Edition

Subtest	Battery	Time Allowed
Verbal Battery	Verbal Analogies	10 minutes
	Sentence Completion	10 minutes
	Verbal Classification	10 minutes
Quantitative Battery	Number Analogies	10 minutes
	Number Puzzles	10 minutes
	Number Series	10 minutes
Nonverbal Battery	Figure Matrices	10 minutes
	Paper Folding	10 minutes
	Figure Classification	10 minutes

Providing students with an intervention to support learning was not a novel idea, however, Plucker et al. (2017) proposed frontloading as a concept to support all students, but especially to provide additional opportunities-to-learn. For students who have had fewer opportunities, frontloading built student knowledge as well as student efficacy. This approach also allowed teachers more opportunities to view student potential. U-STARS~PLUS (Coleman et al., 2010) provided students with science-based lessons and teachers with an observation tool (see Appendix F) to record and become attuned to various observable behaviors that may indicate giftedness.

This framework was built around five goals: provide enriching learning environments, recognize strengths in children who may normally be left out of gifted services, intervene from a strengths perspective, utilize science to encourage learning in other content areas, and engage with families (Coleman, 2016). U-STARS~PLUS cultivated a mindset of viewing students at-potential rather than at-risk through these five key areas (see Figure 6). By creating an environment where learning can thrive and equipping teachers with a tool to conduce systematic observations, U-STARS~PLUS provided both the opportunity and the resources to make giftedness more visible. Siegle et al. (2016) indicated that these two factors are critical in finding a diverse population of gifted learners.

The observation instrument, Teacher's Observation of Potential in Students (TOPS), was constructed around nine domains: learns easily, shows advanced skills, displays curiosity and creativity, has strong interests, shows advanced reasoning and problem solving, displays spatial abilities, shows motivation, shows social perceptiveness, and displays leadership (Coleman et al., 2010). Each of these nine domains had suggestions for what the behavior might look like in a

classroom setting. The behaviors listed were selected to provide ideas for teachers and attempt to be culturally balanced. To view the full TOPS form, see Appendix F.

A core belief of the U-STARS~PLUS framework was that science is naturally interesting and engaging for young students. Hands-on science activities along with student-friendly shared texts were at the heart of the framework. The activities were designed to promote thinking, captivate students' interest, and focus on exploration and problem solving (Coleman et al., 2010). The science topics selected are designed to create learning opportunities that were not dependent on prior experiences. Novak and Jones (2021) identified teachers as gatekeepers leading to disproportionality of Black students in gifted education. Teachers' desires to ensure that all students pass state exams, to overlook students who are already performing, and perceived problems within identification processes resulted in students being left out of gifted services.

Summary of Uncovering Student Potential

In the past, gifted education sought to find the few individuals who were preeminent in order to provide those few with advanced learning opportunities (Renzulli, 2012). Over time and with increased access to public education, the realization that giftedness could be developed and can be found in all populations had created both opportunity and challenge. As the educational system continued to evolve, viewing students as at-potential rather than at-risk would best situate schools to meet the needs of all students, including gifted students.

Foundationally, education of the gifted must have two key elements. The first was to establish a structure where students can maximize potential especially in areas where they were strong. Second, gifted program must grow the leaders and problem-solvers of the future (Renzulli, 2012). Gifted education has the ability to help or hinder the growth of children and,

done well, gifted services will equip students to generate new knowledge that will be beneficial to society.

The following chapter details my action research for transformation project where I implemented a plan of action built upon the knowledge base shared in this review of literature. By providing access to universal screening and academic talent development guided by the U-STARS~PLUS framework, the participating teachers and I worked to achieve proportional representation of Black and Hispanic students. No longer will we be willing to accept that underrepresented populations of students are left out of gifted services.

CHAPTER 3: METHODS OF INQUIRY

The focus of my action research for transformation examined the impact of implementing (a) an academic talent development approach to the identification of students for inclusion in an academically gifted program, and (b) nonverbal screening instruments to broaden the demographics of the students both initially referred for and ultimately identified as academically gifted in ECCS. The specific problem addressed in this study was that the current identification practices lead to inequitable identification across student demographics—specifically the White, Black, and Hispanic demographic categories. Inequitable identification created opportunity gaps which likely resulted in excellence gaps for our students as they move through grades.

Inquiry Rationale and Design

Achieving proportional representation of gifted students at the partnering elementary school guided the work of my inquiry. While gifted services were not the only avenue to access rigorous, advanced, and challenging content, identification often created access to additional opportunities-to-learn. The underrepresentation of children from Black and Hispanic communities exacerbated opportunities to learn and increased excellence gaps.

Action Research for Transformation

Action research allowed me to collaborate with participating teachers and students within the school culture. Through prolonged engagement and partnership, we were more likely to achieve shared understanding and lasting change (Creswell & Poth, 2018; Mertler, 2019). Through iterative PDSA cycles and data collection, I determined if the interventions have been effective in broadening the views of teachers related to gifted students and created a framework that was more responsive to encouraging referrals of a proportionally diverse population of gifted students.

Timeline and Key Elements of My Action Research

Figure 10 provides a timeline and overview of the processes and data collection tools for my endeavor to make a positive impact on this focus of practice. Throughout my action research endeavor I learned about the current experience of teachers related to screening, referring, and identifying students for gifted services. Ascertaining the pre-study beliefs of teachers and examining how the implementation of an academic talent development framework, U-STARS~PLUS, impacted teacher beliefs and gifted nomination practices allowed me to design and propose practices which will result in a more proportional representation of students receiving gifted services.

Six distinct phases occurring over ten months comprised my study. Each phase was designed to address the three research questions guiding this work:

1. To what extent will the implementation of the U-STARS~PLUS academic talent development framework impact the representation of Black and Hispanic students within gifted services at Friendship Elementary School in ECCS?
2. To what extent will the NNAT3 paired with the nonverbal sections of the NV CogAT result in the identification of a more demographically representative gifted population?
3. To what extent will changes in teachers' U-STARS~PLUS-informed referrals align with participating students' results on the NNAT3 and NV CogAT?

Participants

Participation in my project occurred at two levels. At the more global level, I reached out to discuss the potential of my study with schools in which the demographic imbalance appears to be particularly problematic. From the sites whose leaders expressed interest in participation in

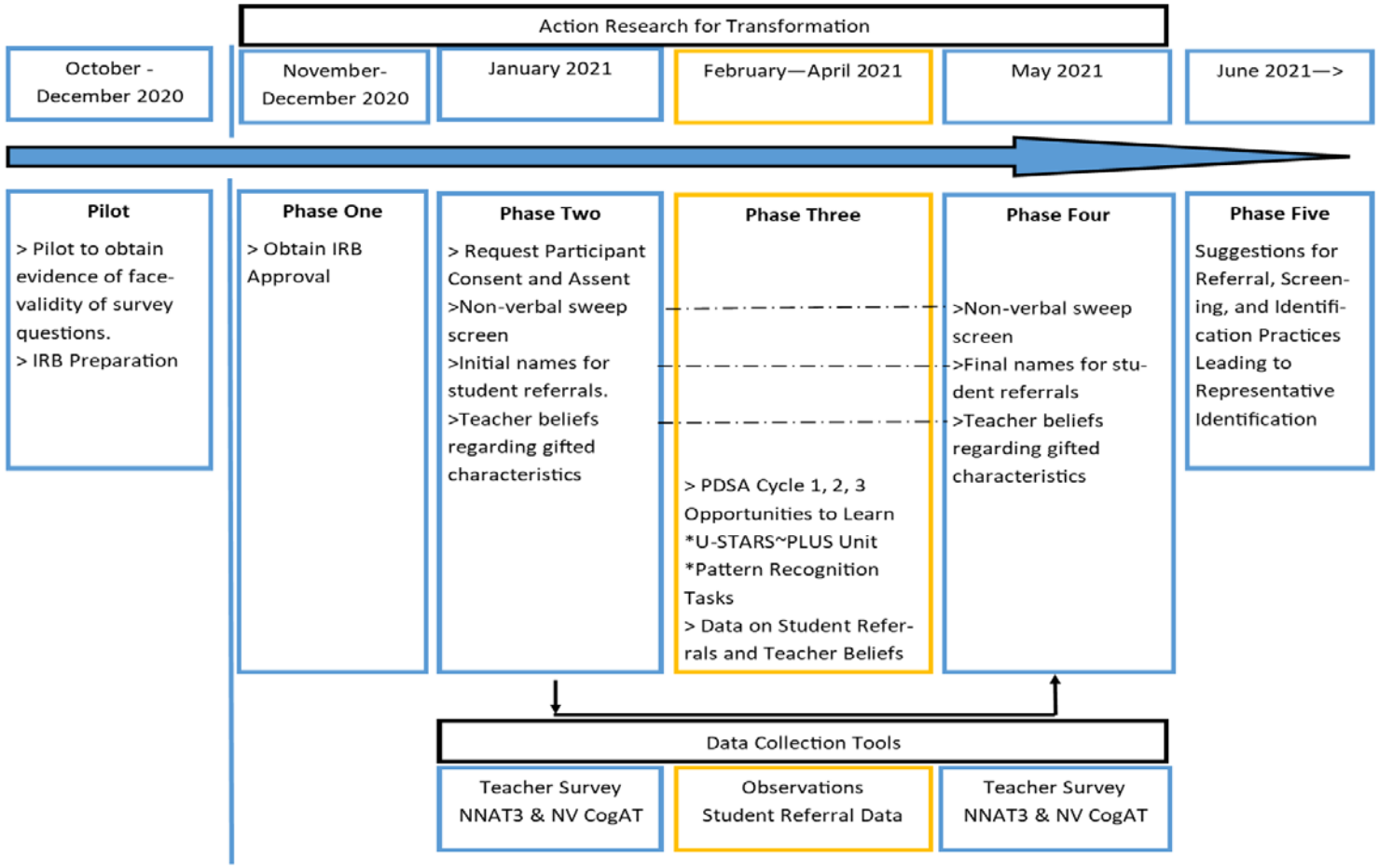


Figure 10. Action Research for Transformation Project.

this action research, I entered into partnership with one site. At the more fine-grained level, I sought to collaborate with teachers and their students at the grade levels in the partnership school.

School Partnership

As discussed in detail previously in Chapter 1, I utilized the concepts of risk ratio (RR), risk difference (RD), and raw differential representation (RDR) (Curran, 2020; Girvan et al., 2019) to identify possible study partnership schools. The outcome of my calculations of these metrics was primary in the initial vetting process. Other factors considered included the willingness of the school leadership and teachers to partner, the number of students in the school, the number of Black and Hispanic students not identified (according to RDR). As seen in Table 3 and Table 4, these data points indicated a need for intervention. Based upon the RDR, between six and seven Black students are being overlooked when compared to the identification rate of White students. Additionally, between five and six Hispanic students were similarly overlooked.

The combination of these data points along with my ability to travel to and spend significant amounts of time with the inquiry teachers were the primary decision-making considerations. Based on these factors, I extended an invitation for one school site to collaborate with me in this action research for transformation project (Bradbury et al., 2019). I considered inviting a second school, but after reflecting on the time commitment required to serve two schools this was not thought to be feasible. Therefore, collaborating with one school was the most viable option. The administration and teachers of Friendship Elementary and I examined current conditions related to gifted referrals, beliefs about giftedness in students, and discussed the goals of this project prior to engaging in this partnership.

Table 3

Students in Grade 3 and Grade 4 at Friendship Elementary

	Black Students Identified	Total Black Students	Hispanic Students Identified	Total Hispanic Students	White Students Identified	Total White Students
Friendship Elementary	1	46	4	56	13	78

Note. Based on Spring 2020 ECCS AIG Headcount. Total number of students in the school is 199 with 24 of those students identified as gifted.

Table 4

Metrics for Friendship Elementary

	Risk Ratio (RR)	Risk Difference (RD)	Raw Differential Representation (RDR)
Black Students	0.13	-0.14	-6.67
Hispanic Students	0.43	-0.10	-5.33

Note. Based on Spring 2020 ECCS AIG Headcount.

Within School Collaboration

Having formed partnerships at the school level, I discussed with the school leadership and the classroom teachers to determine what grade levels were best suited for my project. I anticipated that this project would be best focused on Grade 3 and Grade 4. These grades are the two where most students in ECCS were initially referred for gifted identification.

Throughout my project, I maintained close collaboration with participating teachers. I supported teachers weekly by visiting classrooms and planning meetings. This collaborative time allowed time for the implementation of U-STARS~PLUS, the classroom use of pattern recognition tasks, and allowed me to support implementation with fidelity. This prolonged engagement allowed us to develop a true partnership in alignment with the ideals of action research for transformation (Bradbury et al., 2019).

Additional Inquiry Partners

This action research involved partnership at several levels within the school and school system. These layers of collaboration ensured I maintained a focus on best practices, accurate data collection, and system improvement. From a district perspective a representative from executive staff, the executive director for elementary education, and director of research and accountability each played vital roles throughout this action research.

As my study worked directly with one elementary school, the most critical collaboration occurred between the participating teachers and me. Other school-based partners were invited to collaborate as well. Additional participants including building administrators, gifted specialists, and the instructional coach were invited to participate as collaborators. Table 5 provides more information for each partner with a focus on roles throughout my action research.

Table 5

Roles of District and School-Based Staff During My Action Research

Position	Role During Inquiry
Executive Staff Representative	• Guide overall permissions • Advise with IRB process • Review and provide suggestions with study planning • Provide survey and/or interview access as needed • Assist with school-level acceptance • Allow for dissemination of information at the conclusion of the study to other school sites
Director of Elementary Services	• Assist with finalizing school (sample) selection • Provide survey and/or interview access as needed • Assist with communication between district and school • Assist with school-level acceptance
Director of Research and Accountability	• Provide access to existing data for students involved in the study and for comparison group(s) as needed • Support test plan development for administering nonverbal assessment • Assist with data analysis
Participating School Administration	• Assist in identifying and addressing barriers and needs (students and staff) • Help acquire, store, and distribute materials • Allow time to work with teaching as needed by the researcher • Provide survey and/or interview access as needed
Gifted Specialist(s)	• Work with school staff on a weekly basis • Work with researcher and teacher to implement the intervention • Assist researcher with administering nonverbal assessment • Provide or gather background information regarding students involved in the study • Provide survey and/or interview access as needed
Classroom Teachers	• Work with researcher and teacher to implement the intervention • Assist researcher with administering nonverbal assessment • Provide or gather background information regarding students involved in the study • Provide survey and/or interview access as needed

Table 5 (continued)

Position	Role During Inquiry
Instructional Coach	• Collaborate with the researcher to identify potential barriers and needs • Provide survey and/or interview access as needed

Ethical Considerations

East Carolina University adheres to best practices in all research involving human subjects. In preparation for this dissertation in practice, I completed Collaborative Institutional Training Initiative (CITI) training via online modules and demonstrated understanding of the content through quizzes on each. The CITI modules addressed ethical topics including assessing risk, informed consent, privacy and confidentiality, research in educational settings, and vulnerable subjects.

An expedited IRB approval was completed through East Carolina University. The IRB approval from the university was presented to the local school district's IRB team to conduct a review of the processes and protections to ensure that all proposed practices aligned with local school board policy. This district team was comprised of district level and school-based leaders who have previously worked with research involving human subjects. Following district approval, a meeting was held with the building level leadership involved in this study to provide information related to informed consent, goals of the research, and to address any questions or concerns.

Participant confidentiality was maintained throughout and following the study by deidentifying all participant and school data. Each participant was provided with informed consent prior to any participation in my dissertation in practice (see Appendix B). This permission included the opportunity to opt-out if desired. Where possible, existing data and school structures were used to lessen any potentially harmful impacts on participants. A pseudonym was maintained throughout all writing to protect the identity of the district in the study. Secure, password protected, cloud-based storage through Microsoft 365 was utilized for housing and archiving all data.

It was my goal as a scholarly practitioner to only engage in activities which would positively impact the educational experience of participants. The results of the study were meant to guide future decisions related to gifted services in the district moving forward.

Measures

I used two formal assessments to gather quantitative data as pre-and post-project measures. The NV CogAT (Lohman & Lakin, 2018) and NNAT3 (Naglieri, 2018) were selected due to their common use and accessibility. These measures provided insight into student potential and provide comparison with teacher perceptions of giftedness in students. Additional qualitative data was collected from participating teachers from multiple sources including: teachers observations of students, my classroom visit observations, reviewing student work on pattern recognition tasks, informal conversations with teachers, and a pre- and post- project survey of participating teachers (see Appendix E).

Selection of Quantitative Data Instrument

The NV CogAT (Lohman & Lakin, 2018) and NNAT3 (Naglieri, 2018) are the two most commonly used measures of aptitude used by the ECCS system. Students in ECCS typically are identified as academically or intellectually gifted by scoring at the 92nd percentile on the NV CogAT and pairing this score with achievement data points. Students are also able to be identified using only achievement data scores. However, as discussed in detail in Chapter 2, achievement data are influenced by prior learning experiences which are not equally distributed across each student (Wai & Lakin, 2020). Universal application of nonverbal measures of ability including the NV CogAT and NNAT3 have been shown to identify a more diverse population of gifted students (Giessman et al., 2013; Wai & Lakin, 2020). Since both the NV CogAT and NNAT3 are currently in use in ECCS, I believed my study could shed light on the best way to

utilize these instruments for gifted identification. Gathering data on participating student performance on each instrument allowed me to make recommendations on the future use of one or both instruments. Use of both these instruments was also likely to be supported using current funding within ECCS.

Selection of Qualitative Data Instruments

Participating teachers utilized the U-STARS~PLUS classroom observation from (Coleman et al., 2010) (see Appendix F). This was known as the Teacher's Observation of Potential in Students (TOPS) form. This document allowed teachers to quickly note when they observe student behaviors from nine different categories: learns easily, shows advanced skills, displays curiosity and creativity, has strong interests, shows advanced reasoning and problem solving, displays spatial abilities, shows motivation, shows social perceptiveness, and displays leadership.

Second, I conducted classroom observations utilizing the TOPS form (Coleman et al., 2010) as well as recording observations relating to student and teacher actions. Classroom visits also provided an opportunity to gather informal conversational notes regarding implementation of U-STARS~PLUS.

A third source of qualitative data was obtained through the analysis of student work completed on the pattern recognition tasks provided to each classroom. I also asked teachers to share their experiences and student quotes related to these tasks. In order to make this as unobtrusive as possible, I gathered this feedback while performing classroom visits or participants emailed their thoughts and experiences

Pilot Study

During the Pilot Study phase of my focus of practice, I focused on two elements: gaining IRB approval and testing my survey instrument. Calibrating survey and interview items during October 2020 allowed me to ensure that the questions asked are appropriate and were interpreted by users in the way that I intended. I invited gifted education specialists, teachers, and administrators who were knowledgeable about elementary education but not likely to be participants during the study phase to provide feedback and input.

IRB Approval

My Pilot Study occurred while seeking IRB approval. This phase posed no risks to those providing input and did not involve any potential study participants. During this time, I assembled all the required forms and ensured that all of the plans for this action research were in alignment with the university's and school system's IRB processes. Approval was obtained from the university first and then the school system.

Pilot Study and Interview Questions

Survey questions focused on the characteristics that teachers expected to see in students they are likely to refer. Additional questions asked for names of students that teachers currently view as potentially gifted. Determining and clarifying the background context of the district and school was a focus for me during the Pilot Study. Data regarding demographics of current referrals and identified students allowed me to initiate the partnership process as discussed above. Finally, during this timeframe I submitted my study for IRB approval at both the university and school system levels.

Phase One: Baseline Data Collection

Following IRB review and approval, Phase One allowed me to learn the culture of the school site, build relationships with teachers involved in my study, be seen by participating students as a regular visitor, and gather data from teachers. Data collection occurred through a survey which asks teachers to share names of students they view as potentially gifted and what characteristics they commonly associate with giftedness in students. Phase One took place between November and December 2020. The baseline data collected during Phase One created a data set for comparison with data to be collected in Phase Four. Additionally, I gathered informed consent forms from administrators, the gifted education specialist, and the partnership teachers. Copies of informed consent forms are included in Appendix B.

Current Student Referrals for Gifted Identification

Through a secure survey, each teacher participant was asked which, if any, students they have already referred for gifted identification screening. Each teacher was asked for names of student they already viewed as gifted or who should be referred for screening and possible identification. This list of names was collected in prior to beginning action research cycles.

Teacher Perceptions of Characteristics of Gifted Students

Utilizing the same secure survey used for student referrals, each teacher participant listed characteristics that they viewed as indicators of giftedness in students. These data were utilized to help determine and highlight pertinent attributes in the U-STARS~PLUS teacher observation protocol. The attributes shared with me at the start of my study were later compared to those listed in Phase Four to determine if teacher perceptions of giftedness changed as a result of the implementation of U-STARS~PLUS.

Phase Two: Initial Participating Student Data Collection

Gathering baseline data on students participating in this action research occurred during January 2021. These baseline data were collected using the nonverbal section of the CogAT (Lohman & Lakin, 2018) along with the NNAT3 (Naglieri, 2018). Utilizing both instruments during Phase Two and again at the conclusion of my action research allowed me to compare the outcome of each measure as it relates to identifying potential giftedness in Black, Hispanic, and White student participants.

Sweep Screen of Participating Students

In ECCS, the most common initial point of gifted identification was Grade 3. The sweep screening with two nonverbal measures prior to and following my action research cycles provided additional data points for analysis regarding the effectiveness of the interventions including the implementation of U-STARS~PLUS (for an extended discussion of the U-STARS~PLUS framework, see Chapter 2). Additionally, the sweep screen data provided data points to compare to teacher recommendations. Finally, the combined use of the NV CogAT (Lohman & Lakin, 2018) and the NNAT3 (Naglieri, 2018) allowed me to examine if either measure results in a more diverse population for gifted referrals.

The results of this initial screening were saved, but not analyzed or shared until the action research PDSA cycles have been completed. This was be done to avoid potential bias based on student performance on the part of both teachers and me. Student referrals typically occurred prior to aptitude testing in ECCS. Therefore, when I asked teachers to list students whom they view as gifted, I did not want their responses to be influenced by the results from the initial student data collection.

Sweep Screen Comparison

During Phase Four and Phase Five, the student data from this initial collection was compared to student data collected post-research. This allowed for analysis of growth as measured by a formal assessment. Further, both sets of student data, pre- and post-, were compared to teacher recommendations for student referrals to study alignment. This comparison allowed me to analyze if teachers' perceptions were reflected in formal assessment scores.

Phase Three: PDSA Cycles - Opportunities-to-learn

Three action research cycles comprised the plan-do-study-act (PDSA) cycles within my study. Each cycle contained two opportunities-to-learn shared with participating students in Grade 3 and Grade 4 at the partnering school site. The framework of U-STARS~PLUS was used to infuse grade level-appropriate, inquiry-based science learning tasks along with shared readings. During the administration of these units, classroom teachers recorded student behaviors utilizing the class observation protocol (see Appendix F). Phase Three was planned to occur during February, March, and April 2021. Each month a new U-STARS~PLUS unit was be introduced. As much as possible, units were selected to enhance, enrich, or supplement standards designated for coverage at the grade level.

Additionally, participating teachers were provided with nonverbal pattern recognition tasks to be used as they deemed appropriate within the classroom daily schedule. These tasks mirrored those found on the NV CogAT (Lohman & Lakin, 2018) and NNAT3 (Naglieri, 2018) and were intended to build levels of understanding and comfort with solving such tasks.

Throughout each cycle, I met with each participating teacher and asked if there were different students they would now refer for gifted identification. I also asked participating teachers what characteristics they viewed as possibly indicating giftedness in students.

PDSA Cycle One

As shown in Figure 11, the PDSA Cycle One allowed me to work with participating teachers to engage in two opportunities-to-learn with participating students. During this cycle, I learned about the current beliefs of participating teachers and how to best support the implementation of a U-STARS~PLUS unit. Cycle One concluded with an examination of changes in participating teachers' views of giftedness in students and the selection of unit for the Cycle Two.

U-STARS~PLUS Unit Implementation

Topic selections from the U-STARS~PLUS framework were initially based on alignment with classroom instruction. Following a review of the ECCS pacing guide and discussion with participating grade level teachers, a first unit topic was chosen from the U-STARS~PLUS materials and lessons were planned and prepared for classroom implementation. Teachers received overviews of the materials and were provided with all materials necessary for implementation. Teachers also learned how to utilize the classroom observation protocol folders. These folders were quick reference guides where student behaviors related to giftedness were noted. During implementation, the classroom teacher experienced support from the gifted education specialist and me.

Pattern Recognition Task Implementation

Nonverbal pattern recognition relies on a student's ability to expect that what they are viewing make sense and that the pattern can be extended. These tasks also required a student to make both concrete and abstract connections with the images they are viewing. Students with little exposure to such tasks may not be as likely to show their abilities on a formal assessment. Teachers were provided resources which include one pattern recognition task to use as part of

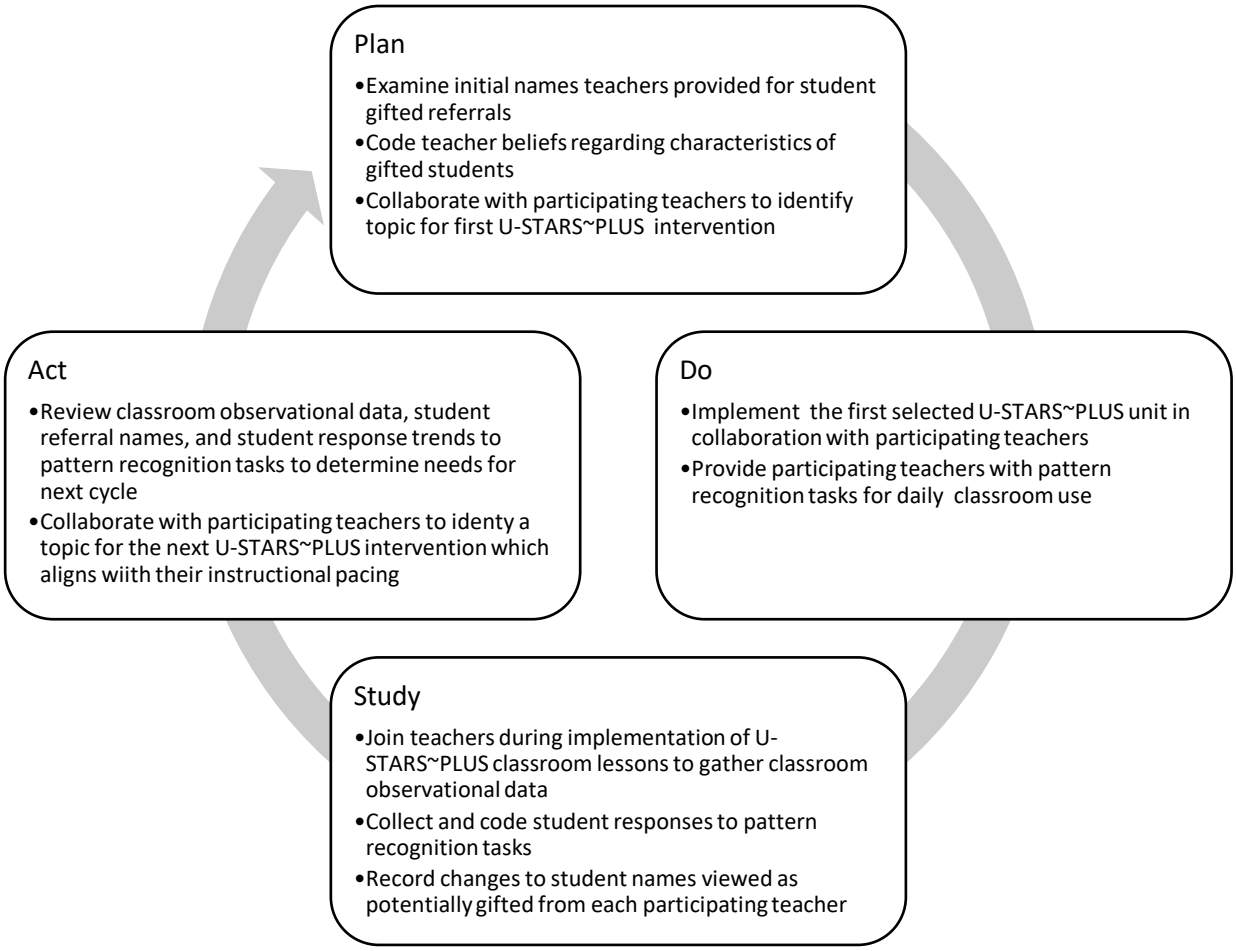


Figure 11. Overview of PDSA Cycle One.

their school day. The timing and use of the nonverbal tasks were designed to be flexible to allow teachers the autonomy to implement at times that works best during classroom instruction. As part of the end of unit discussion, I asked teachers if any students showed gifted characteristics based on their thinking or work with these tasks. However, the intent of these tasks was to provide increased opportunities-to-learn and exposure to a novel task like pattern recognition prior to the second administration of the nonverbal aptitude tests.

Collect Teacher Perception Data

Late February 2021, at the conclusion of the first U-STARS~PLUS unit, I met with each teacher participant to discuss and record their feedback. My questions mirrored the opening survey and focused on recording names of students they currently see as demonstrating characteristics of giftedness and eliciting their thoughts about what they are currently looking for as characteristics of gifted behaviors during learning. All data was kept securely and confidentially for review during Phase Five.

PDSA Cycles Two and Three

In close parallel with PDSA Cycle One, PDSA Cycles Two and Three provided participating students with additional opportunities-to-learn through topics created from the U-STARS~PLUS framework as shown in Figure 12. Data were collected through observations of participating teachers' classrooms. Participating classrooms were also provided with pattern recognition tasks for daily use. Participating teacher beliefs and names for student referrals were collected at the conclusion of each cycle. The cycles of my action research for transformation concluded after the Phase Three, but participating teachers were able to continue to use the framework if they desired.

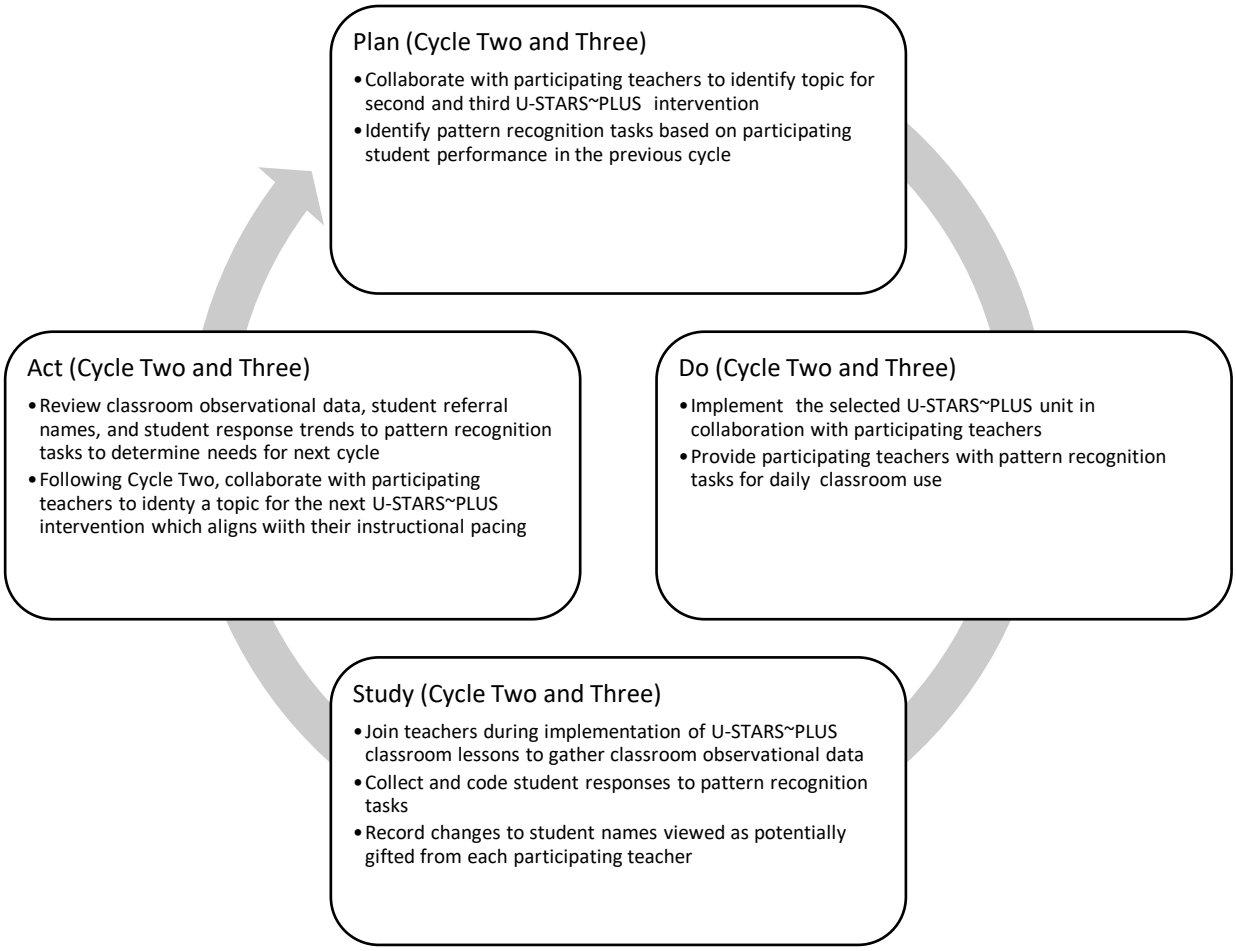


Figure 12. Overview of PDSA Cycles Two and Three.

U-STARS~PLUS Cycle Two and Three

The content of Cycle Two and Cycle Three was based on student learning needs, district pacing, and teacher requests. Teachers were provided with any required professional learning, all supplies, and support from both the gifted education specialist and me. Each unit lasted approximately one-month. During each cycle, I worked with each participating teacher to support implementation with fidelity and to address any questions.

Pattern Recognition Tasks Cycle Two and Three

A new set of pattern recognition tasks was provided to teachers at the start of the unit. Teachers received one task for each day of instruction and asked to incorporate the tasks in the natural flow of their teaching. I asked that student responses to pattern recognition tasks be shared with me to enable me to look for trends in student responses. During Cycle Two, this allowed me to select or create tasks that align with student strengths and needs.

Collect Teacher Perception Data Cycle Two and Three

At the conclusion of the second and third U-STARS~PLUS units, I met with each teacher participant to discuss and record their feedback. Questions were the same as those asked following Cycle One. I recorded the names of students they saw as demonstrating characteristics of giftedness and their thoughts about what they are currently looking for as characteristics of gifted behaviors during learning. All data will be kept securely and confidentially for review during Phase Five. Cycle Two concluded at the end of March 2021 and Cycle Three concluded at the end of April 2021.

Phase Four: Post-Research Data Collection

Following the PDSA cycles, I gathered exit information from each participating teacher and participating student using the same tools and techniques I used during Phase One and Phase

Two. Participating teachers were asked to complete an exit survey and I invited them to debrief with me regarding their participation in my action research project. In addition, participating students were administered the NV CogAT (Lohman & Lakin, 2018) and NNAT3 (Naglieri, 2018) a second time. All data were collected and stored for analysis in Phase Five.

Post-PDSA Cycles Student Data Collection

Phase Four included collecting post-research data from students by administering the same assessments used in Phase Two: NV CogAT (Lohman & Lakin, 2018) and NNAT3 (Naglieri, 2018). The initial data were used as baseline and compared with post-research data during Phase Five. Phase Four is occurred during May 2021 following the conclusion of all PDSA cycles. All students who participated in the PDSA cycles were asked to take the two measures of aptitude.

Post-PDSA Cycles Teacher Data Collection

Teacher perceptions and debriefing also occurred during Phase Four. Each teacher-participant was asked to submit final student names for gifted referrals and asked what characteristics they looked for in students when deciding to make a referral for gifted screening and identification. Data were gathered using the same survey instrument which was used in Phase One to collect baseline names and perceptions. Teacher-participants were given the opportunity to debrief with me in order to share any other questions or insights related to my study.

Phase Five: Suggestions for Future Practice

My action research for transformation was designed to guide the work of the decision-making processes in ECCS related to gifted strategic planning specifically related to achieving proportional representation within gifted services. I began Phase Five in June 2021 and

continued through the fall of 2021to develop suggestions to be presented to senior district leadership, school-based gifted education specialists, district content coordinators, district research and accountability, and school administrators. To recap, my study was designed to answer these three questions:

1. How will the implementation of the U-STARS~PLUS academic talent development framework impact the representation of Black and Hispanic students within gifted services at the partner site in ECCS?
2. How can the NNAT3 paired with the nonverbal sections of the NV CogAT be used to identify a more demographically representative gifted population?
3. How do changes in teacher referrals align with participating students' results on the NNAT3 and NV CogAT?

Current Practices and Transformations Under Consideration

In my action research for transformation project (Bradbury et al., 2019), I sought to address concerns related to underrepresentation of Black and Hispanic children within the identified gifted population. In this project, I determined if additional opportunities-to-learn impacted the proportional representation of gifted Black and Hispanic students within gifted referrals. Further, I reviewed the current practices for screening, referral, and identification. Based upon the findings of this action research project, I made recommendations to district leaderships for further considerations of alternative pathways to gifted identification.

Student Opportunities-to-learn

Elementary students in ECCS received additional services from gifted education specialists only if they are identified through a formal testing process or if they are noticed by their teacher and referred for talent development services. Students who have not had equivalent

opportunities-to-learn are not as likely to demonstrate behaviors that teachers are likely to look for related to giftedness. My action research project reviewed the opportunities-to-learn which can be more equitably distributed across classrooms. Utilizing the U-STARS~PLUS framework along with pattern recognition tasks, I examined if gifted behaviors can be made more visible in a proportionally diverse population of students.

Screening and Referral Practices

Screening was the processes by which students are initially recognized as potentially gifted. Screening in ECCS involved the gifted education specialist gathering achievement data from various sources including diagnostic testing, classroom performance, previous grades, and End-of-Grade testing results. Despite being a recognized best practice, universal screening was not practiced in ECCS (Card & Giuliano, 2016). Therefore, all screening was based on classroom or formal achievement data. My study highlighted the utility of a universal screening measure for student aptitude. Further, the analysis of the data from my study indicated which of the two aptitude measures (NV CogAT (Lohman & Lakin, 2018) or NNAT3 (Naglieri, 2018)), was more likely to be appropriate for use with students from Black and Hispanic backgrounds.

Identification Practices

While screening and referral were important parts of the identification process, they were just the first step. As there was no process for sweep screening, referrals were the only way to get a child to the testing and identification phase. Even with a sweep screen, the identification practices can create further barriers to representational identification. During Phase Five, I examined the impact of the academic talent development framework, U-STARS~PLUS, along with the results of the sweep screening to determine what next steps would be necessary for achieving representational identification.

Inquiry Design Rigor

Establishing trustworthiness for this Focus of Practice was created through building credibility, transferability, dependability, and confirmability (Mertler, 2019). Specifically, I utilized the techniques of persistent and prolonged engagement, peer debriefing with collaborative inquiry partners, member checking, thick description, and purposeful sampling (Mertler, 2019). Limits to these techniques to address trustworthiness were also addressed.

Persistent and prolonged engagement with the study site and the participants served multiple purposes each leading to increased trustworthiness of the study. Through my work at the district level, I was engaged with Friendship Elementary, administration, gifted specialists, and teachers, for a number of years. This aided me in identifying patterns and knowing what is normal, expected behavior and what is not. Establishing and maintaining relationships with the school staff created a sharing, trusting environment. Knowing the culture of the school allowed me to be a partner in this inquiry. Spending time prior to and throughout this study allowed me to build relationships and professional rapport with staff.

Peer debriefing with collaborative inquiry partners increased the validity of data and findings by ensuring that what I believe I have heard and what I am perceiving were aligned and accurate from multiple points of view. This reflection process occurred at the school and district level with partners throughout my action research and specifically when generalizations were made. Examining themes, identifying potential areas of bias, reflecting on concerns, and establishing next steps were roles fulfilled by peer debriefing.

Focus groups and interviews allowed me to hear directly from participants. I sought to maintain trustworthiness by asking participants to verify my hearing, understanding, and interpretation of their responses during and following each interaction.

Creswell and Creswell (2018) identified Explanatory Sequential Design as rigorous data collection process which allows for viewing data from multiple perspectives. This mixed-methods approach allowed me to first obtain qualitative data from participants. I then analyzed that data and utilized quantitative measures to confirm or disprove my initial findings. This allowed for a deeper level of interpretation by utilizing qualitative data to explain quantitative findings.

Throughout my project I maintained a journal of my thinking, planning, concerns, and pondering. Journaling enhanced reflexivity by documenting my initial thought processes and understandings. These entries were compared to the data collected to identify any possible assumptions and biases. Journaling was the first step in compiling thick description of data. All data from interviews, focus groups, and observations were be collected and maintained electronically. Capturing of these data was rich and robust to include as many details about the setting, interactions, beliefs, and responses as possible.

Delimitations, Limitations, and Assumptions

The findings my action research were bounded by the scope of the study location and are not intended to generalize to a whole population of gifted learners. There may be sites that have similar characteristics to Friendship Elementary which can learn from the results of this inquiry, but the findings are not meant to be statistically generalizable.

Sample size created a limitation of this Focus of Practice. The size of Friendship Elementary may be similar to many sites within ECCS but may not be similar to schools in other locations. This may limit the generalizability of findings. During the timeline of this study, COVID-19 presented limiting factors to include the amount of time students are physically in

school, teachers providing both face-to-face and online learning, and many students choosing to leave physical school buildings and attend the county's virtual school.

Social desirability may have created a challenge within this study. As a scholarly practitioner and employee of the district I may have been in a position in which participants want to respond in a manner they believe is acceptable to me. As I collected survey data and conducted classroom visits, I had to consider and be open to the idea that participant loyalty to Friendship Elementary or ECCS may influence their responses.

Summary

My action research for transformation utilized a mixed-methods approach, specifically explanatory sequential design (Creswell & Creswell, 2018). During this project interventions meant to help with the identification of students were be studied. I have experienced prolonged engagement with the school systems spanning more than 23 years and more than 11 years working with gifted services. This longstanding relationship with schools, administrators, and teachers assisted me in recognizing areas for improvement and allowed for leveraging relationships to implement meaningful interventions.

The research design for this project provided opportunities for collaborative inquiry partners to guide and assist the process. These partners were asked to assist through all points during this project including the Pilot Study, the development of survey questions, the implementation of interventions, and the data analysis. Through careful analysis of the data, decisions for future planning and practices were guided by locally conducted research.

CHAPTER 4: RESULTS

The purpose of my research was to determine if implementing a series of STEM-based talent development lessons along with two nonverbal sweep screening tools with Grade 3 and Grade 4 students at Friendship Elementary in East Carolina County Schools (ECCS) would result in a more demographically diverse population for gifted services. As discussed previously, Black and Hispanic students are underrepresented in gifted services across schools in ECCS. I invited Friendship Elementary into this learning partnership for three main reasons. First, both Black and Hispanic students were underrepresented at Friendship Elementary at a rate that was average for the overall district. Further, Friendship Elementary was demographically diverse which provided the opportunity for me to see if the interventions I implemented made an impact on the demographics of those identified or subsequently invited to receive the services provided for academically gifted students. Second, Friendship Elementary had a willing administrative team along with staff members who were interested in examining the current reality and were open to implementing refinements. Third, the geographical location of Friendship Elementary made it accessible for me to become integrated with the school community.

If my research reveals that one or more interventions results in a more diverse talent pool for identification, I will be able to examine broader implementation and inclusion of that/those intervention(s) in the context of the ECCS gifted services strategic plan. Further, awareness of an individual's potential could result in providing them with increased access to academic and enrichment opportunities. Ultimately, my research will generate data to guide future actions at Friendship Elementary and across ECCS.

Research Questions

My work in this action research for transformation project allowed me to be embedded with the school faculty at Friendship Elementary to examine three guiding questions:

1. To what extent will the implementation of the U-STARS~PLUS academic talent development framework impact the representation of Black and Hispanic students within gifted services at Friendship Elementary School in ECCS?
2. To what extent will the NNAT3 paired with the nonverbal sections of the NV CogAT result in the identification of a more demographically representative gifted population?
3. To what extent will changes in teachers' U-STARS~PLUS-informed referrals align with participating students' results on the NNAT3 and NV CogAT?

The acronyms used in my research questions are described in detail in Chapter 2.

Teacher Participants

Grade 3 and Grade 4 teachers were invited to collaborate in my study. I selected the teachers in these two grades since Grade 3 is typically the initial grade for gifted identification in ECCS. By inviting the teachers of the Grade 4 students, I created a larger collaboration and established a school network. Each grade level had three teachers along with one multi-age classroom of dual-language immersion participants. The median Grade 3 class size was 16 while the median Grade 4 class size was 25. Teacher participants' years of experience ranged from 3 to 26 years. Each teacher was actively engaged and participated in all planning sessions as well as the implementation of the NNAT3 and NV CogAT.

Student Participants

Students from each Grade 3 and Grade 4 classroom participated in my action research for transformation project. All were provided with Student Assent information through a classroom briefing and all parents were given the opportunity to provide consent for participation (see Appendix C and Appendix D). Three families asked not to be included. Those students were given alternative learning assignments as needed. There were 63 Grade 3 student participants ranging in age from 8 years 5 months to 10 years 3 months. The median age for Grade 3 was 9 years 0 months. There were 79 Grade 4 student participants ranging in age from 10 years 0 months to 11 years 2 months. The median age for Grade 4 was 10 years 0 months at the beginning of my study. Student demographics are outlined in Table 6.

Action Research for Transformation Project: Implementation Timeline

Working in collaboration with the local school system and Friendship Elementary, I was able to adapt the initially proposed timeline earlier shown in Figure 10. The revised timeline allowed me to gain consent, conduct my study, analyze data, and make suggestions through this action research for transformation project in a timely fashion even in the midst of the disruptions associated with COVID-19 (see Figure 13).

Phase One: IRB Approval

During November and December 2021, I submitted all required forms for the East Carolina University Institutional Review Board (IRB) as well as the ECCS IRB approval process. All required documents were created and submitted to IRB standards. On November 26, 2020, ECCS granted IRB approval (see Appendix A). On December 4, 2020, IRB approval was granted under UMCIRB 20-002677 through East Carolina University. My study was deemed to pose no more than minimal risk.

Table 6

Study Population: Students in Grade 3 and Grade 4 at Friendship Elementary

		Black	Hispanic	White	Total	Grand Total
Grade 3	Male	10	9	16	35	62
	Female	6	8	13	27	
Grade 4	Male	9	10	19	38	79
	Female	10	12	19	41	

Note. Based on Friendship Elementary enrollment as of May 2021. One Grade 3 female American Indian student was not counted in this table.

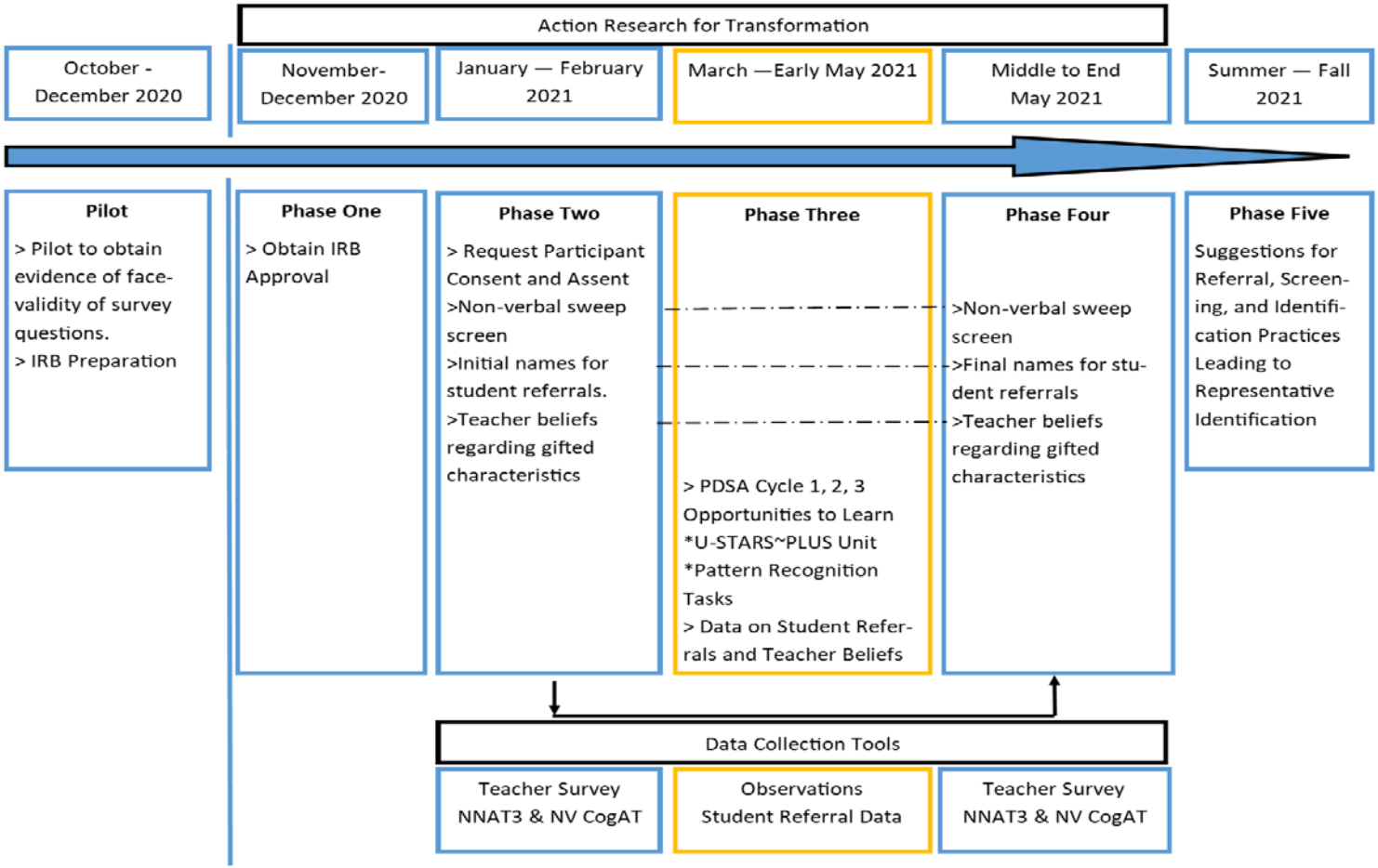


Figure 13. Updated Action Research for Transformation Project.

Phase Two: Consent, Assent, and Initial Screening

My study began on January 4, 2021, when I met with the Grade 3 and Grade 4 teachers, the gifted education specialists, the instructional coach, the assistant principal, and the principal. Prior to this initial meeting, the school administrative team had discussed my project with the teachers to ensure that they were comfortable with learning more.

During the January meeting, we discussed the gifted student identification data from 2020, what they saw as concerns in the data, and my proposal for interventions. I explained the impact on their classroom teaching time and how I would work to reduce burdens. Appendix G contains the presentation that I shared with the school-based team. I built relationships with the teachers by having table group discussions with them and sharing my own questions while welcoming their thoughts. At the conclusion of the 60-minute session, I provided each attendee with a copy of the presentation, handouts with the implementation timeline (see Figure 10), and a copy of the teachers' informed consent document (see Appendix B). Five of the seven teachers signed at that time while two wanted to think more about it. I offered to meet with those two teachers to address their concerns. After this meeting, both were willing to sign and expressed excitement about participating.

Following the completion of the informed consent process, I asked each teacher-participant to complete an initial teacher survey using Qualtrics (https://www.qualtrics.com/). This survey asked participants to respond to a set of questions that I created to provide me with demographic information and initial perceptions of giftedness (see Appendix E). Their responses are crucial baseline data, but to avoid biasing my views of students or teachers, I did not review participants' responses to the Qualtrics survey questions until the closing stages of my study. All teacher participants completed the survey by January 8, 2021. I visited each classroom during the

week of January 7, 2021, to build relationships with teacher-participants and students. These informal visits gave me a chance to build comfort and to be with students before asking them to participate in any study-related tasks.

Beginning January 14, 2021, I distributed copies of the Parental Consent Form (see Appendix C) to each student. Over the following four weeks, students returned forms to their teachers who, in turn, gave them to me. Only three parents asked that their children not be included in my study activities. These students were provided alternative tasks by their teachers throughout the study.

Following receipt of the Parental Consent Forms, I visited each classroom between January 21 and February 19, 2021. During these visits, I shared the Student Assent script with the eligible students (see Appendix D) and answered questions that students had about the study and me. Students in each classroom wanted further explanation about what we would be doing and how these tasks would be completed. I explained that we would have times when we would be completing tasks on the computer to discover how each student sees patterns, that their teacher would be doing some pattern recognition tasks with them, and that we would be doing some science activities together.

Having built rapport with both teachers and students at Friendship Elementary, I began administering the initial nonverbal sweep screening assessments. Between February 19 and March 2, 2021, I visited each classroom to administer the NV CogAT. The technical requirements of the online CogAT exam browser allowed students to use their district issued laptops. This greatly simplified administration as students were comfortable with their own devices and there was no additional time needed for handing out and collecting devices.

Teachers selected times that fit their instructional schedule and my availability to administer assessments. Students were very cooperative and engaged as they took the assessment.

Between March 2 and March 12, 2021, I visited each classroom at a time that was selected by the teacher to deliver the NNAT3 assessment online. Due to the technical requirements of the Pearson Browser, students were unable to use their district issued laptops. Loaner laptops were provided to me by the district to allow for this assessment to be given. Make-ups were provided to students who were absent as needed. All technical challenges were overcome through my collaboration with the teachers.

Students utilized the loaner laptops to access the NNAT3 through the Pearson Browser. Loaner laptops were a similar Dell device, but with permissions that allowed access to the Pearson Browser. Students were given time at the start of each administration to become comfortable with the laptop. Some students chose to use their own external mouse to create a similar experience to their daily laptop use. No students expressed difficulty in utilizing a loaner device. Each administration took approximately 1 hour including distributing laptops, accessing the assessment, delivering instructions, and collecting devices. Students appeared to be comfortable taking the assessment and acted as willing participants. Anticipating that some students would be tiring of taking assessments, I made sure to emphasize that for a few weeks to come, we would be doing science and STEM activities and not using the computers.

Phase Three: Instructional Intervention-Academic Talent Development

To ensure clear communication, I visited each classroom weekly both to deliver the U-STARS~PLUS and STEM learning experiences as well as to check in on each teacher participant. Additionally, I began sending weekly encouragement and scheduling emails to each teacher. These messages served both to keep lines of communication open and to help teachers

keep track of times I would be coming into their classrooms. The teacher participants were receptive to both forms of communication and expressed appreciation for the reminders and opportunities to adjust schedules as needed. I included a link in the email to a shared scheduling calendar. This allowed teachers to sign up for times that were the most amenable to their daily schedules.

While visiting classrooms, I reviewed the Teacher Observation of Potential in Students (TOPS) (Coleman et al., 2010) form with each teacher. I provided each teacher with a smaller version of this tool as well by putting each section of the TOPS on a half-sheet of cardstock and binding them together using a book ring clip. I also provided the teachers with the TOPS folder with all the same criteria as well as a typed version. These three options each contained the same information about characteristics that might indicate giftedness. Some teacher participants preferred the folder while others used the ring-bound set. Having multiple options seemed to make the use of the TOPS form more accessible to teachers. During most classroom visits, I asked teachers what characteristics they were noticing and how useful they found the TOPS form.

PDSA Cycle One

Cycle One was held between March 22 and April 9, 2021. During this two-week period, I worked with each Grade 3 and Grade 4 classroom twice. During the first week, each grade level had the opportunity to listen to a story read aloud, participate in a guided discussion, and engage in an activity. Each grade level was also given an optional take home learning opportunity.

Week 1, Grade 3. For the first lesson with Grade 3, I utilized the U-STARS~PLUS lesson Liquid Logic (see Appendix H) as the framework. While I was leading the lessons, the classroom teacher was asked to review and use the TOPS tool. I opened the lesson asking

students several open-ended questions (e.g., What does it mean when someone asks, What's the matter? and Is that what we are talking about in science?). As part of the lessons, students listened to a shared reading from the text *Snowballs* (Ehlert, 1999). Throughout the reading, I paused to ask open ended questions (e.g., What is the significance of the items the kids are choosing? and What do you predict will become of all the items at the end of the story) and allowed for students to share their thinking. Following the reading, students chose one of the tasks from the choice board I provided to create a response (see Appendix I).

Following the reading and the response activity, students participated in an activity to examine changes in states of matter. In this activity, each student wrote their name using three different liquids (water, ketchup, and oil). Students shared with their teacher and me what they thought they knew, their expectations for what would happen, and their observations over the following few days. Each of these experiences allowed the teacher to observe for potential gifted behaviors. To conclude the lesson, students were given what I termed "interest work." I explained that if they were interested, they were going to be given a take home kit with materials to do an activity or experiment. If they were interested, they could complete the activity and share their findings when we got together the next time. For Grade 3, this activity was Liquid Logic from the U-STARS~PLUS family activity guide. Liquid Logic is an exploration of surface tension while not requiring students to have any knowledge of that concept. Students were provided a penny, eye dropper, and data collection sheet in their take home kit. Students were challenged to think about how many drops could be held on the penny. Students estimated, conducted the activity, and then shared their insights related to why the water behaved the way it did and if their initial predictions were accurate. They were also given prompts to share their ideas for further exploration.

Week 1, Grade 4. For the initial lesson with Grade 4 students, I utilized the U-STARS~PLUS lesson, Lunar Motion (see Appendix J). Following a similar pattern to Grade 3, I facilitated a shared read aloud using the text *Sun, Moon, and Stars* (Chen & Mayer, 2006) and guided discussion. Following the reading students shared their thinking and used the choice board (see Appendix K) to make their thinking visible. The class watched a video showing the properties of the synchronous rotation and tidal locking of the moon. To give students a chance to reveal their understanding of these concepts, they were given an orrery model (see Appendix L) to cut out and assemble. Students were asked to use the model to demonstrate their learning.

As I did in Grade 3, I gave a take home interest activity to students in Grade 4. This activity was from U-STARS~PLUS family activity guide titled Lunar Motion. This activity allowed students to work independently or with their parents to track the phases of the moon over several weeks. The packet included a direction sheet, recording sheet, and reflection questions. Students were encouraged to observe the moon on as many nights as possible and sketch their observations on the recording sheet. Students were encouraged to explore other web-based resources if they were interested in learning more about phases of the moon. I encouraged students to complete the activity and share their findings with their teacher or me the next time we were together.

I also provided a set of pattern recognition tasks for each classroom (see Appendix M). I encouraged teachers to use these at their discretion to support their teaching. Students were encouraged to think through these tasks and share their thinking with their teacher.

Second Week. During my second collaboration with each classroom, I selected the U-STARS~PLUS lesson, Let's Grow. I returned to each Grade 3 and Grade 4 classroom where we discussed the previous lesson's activities. This gave the teachers another chance to hear

differences in thinking. I moved our inquiry to focus on the question: Where does the mass of a tree come from? Students wrote their initial independent thinking, shared with elbow partners, and finally several shared with the class. For an additional way to explore this idea, students watched a video explaining common beliefs about where the mass of a plant originates. These ideas were compared to their initial thinking. Students were provided with two lima bean seeds, one of which was dry and the other had been soaked for an hour in water. Students worked collaboratively to dissect the seed and make observations of what they found inside each seed.

Teachers were encouraged to revisit the TOPS form and note any differences they were seeing in their students. Teachers were also reminded that they could use the TOPS form during any activity or learning experience they were leading as well.

PDSA Cycle Two

Cycle Two was held between April 13 and April 23, 2021. During this two-week period, I worked with each classroom of students twice. During this 2-week cycle, the learning experiences I provided were the same for Grade 3 and Grade 4 students.

First Week. Students were engaged with the lima bean dissection during the previous cycle but still unsure about where the mass of a plant comes from. This led me to decide to continue with a related STEM activity where students were provided with five different types of seeds, cotton balls, and a clear disposable glove. I began the lesson by connecting to the previous lesson and asking for students to share their learning and current thinking. To allow the teacher and myself to see students' thinking, I had each student utilize a note catcher focusing on what they already know about seeds (see Appendix N). I created a kinesthetic experience by asking students to stand up and imagine they are the leaves of a tree. I asked them to put their hands into fists and bring both hands together. I asked them to imagine that as they breathed in their hands

were collecting carbon dioxide (carbon and oxygen). I invited them to act this out and process this like a tree. I reminded them that as a tree, their hands (leaves) are taking in carbon dioxide and splitting it into carbon and oxygen. They modeled this by separating their fists. I asked them to symbolically put the carbon in their pocket and let the oxygen go. After doing this several times, I asked them what would be happening in your pocket? Further, I asked them to imagine a tree doing that through every leaf again and again—each time keeping the carbon and releasing the oxygen. I asked students to share what they would expect to begin to happen to their pocket, or the tree, after days, weeks, months, and years.

To offer students with another visual experience, I provided them with materials to make a garden in a glove. Each student was given five seeds, a clear disposable glove, and five cotton balls. Students worked together to put one seed in each finger of the glove along with a cotton ball and a small amount of water. Students made predictions about what they expected to see after a day, a week, and a month. The teachers decided they wanted to hang these in the classroom windows and make daily observations rather than have students take them home. These glove gardens were hung in each classroom for the next few weeks.

Second Week. During the second week of this cycle, I transitioned the learning experiences to be focused on a different area of STEM thinking. This decision was guided by the request of several of the teacher participants. They expressed a desire to see their students doing something in the physical sciences. I transitioned to using bridges as the center of our learning. During this second week, I worked with each class to build some common understandings around basic bridge design, beam, truss, and suspension. Together we watched a video of the failure of the Tacoma Narrows bridge to both build interest and to see that science does not always work the way we expect. Students were provided with details of their challenge (see

Appendix O). I provided a model of the span that their bridge would need to cover, the vehicle it would support, a list of supplies that they could use, and a budget for those supplies. Students were able to select their working team of up to four members or to work independently. Finally, I explained that this week was about planning and our next time together would be constructing and possibly testing.

During this Cycle Two, each student was also provided with an optional interest activity in a take home packet. This activity was based on the U-STARS~PLUS Family Science Packet, Cyborg Human Machine (see Appendix P). In this activity, students examined and learned about systems of the human body and how certain systems worked like simple machines.

Teachers were once again encouraged to utilize the U-STARS~PLUS TOPS form to keep track of the behaviors they were noticing. Also, a new set of pattern recognition tasks was provided to each teacher to use as they deemed appropriate. These tasks were geared to help elicit student thinking and make them more comfortable with similar tasks on aptitude testing.

PDSA Cycle Three

Cycle Three, the final iteration, was held between April 27 and May 7, 2021. During this two-week period, I again worked with each classroom of students twice. The STEM focus of these two weeks was in the domain of physical science by teacher request.

First Week. During the first week of this cycle, each Grade 3 and Grade 4 classroom was provided with a set of requirements for constructing their bridge. One of the constraints I put on the students was that they had a limited budget to purchase items such as tape, notecards, and string. By limiting the number of items they could purchase from my classroom store, I encouraged creativity (see Appendix Q). Students experimented with a variety of designs in the time they were given. At the end of the class, each group was invited to showcase and test their

design. This gave each group a chance to share their thinking. It also gave many students an opportunity to see that failure is part of the design and learning process.

I provided an optional take-home straw rocket activity for each student. This kit included the straws, cardstock to create the rocket body, and a protractor (see Appendix S). Students were asked to determine a method by using angle measures to accurately predict where their rocket would land. This gave students a chance to experiment both with design and forces while learning about measurement.

Second Week. Building on the take home activity, the task for the second week was to make observations about a rocket constructed from a two-liter soda bottle and filled simply with water and air. We discussed that we could experiment with all types of variables including design and amounts of air pressure, but for our time and our discussion, we would only manipulate one variable. That variable would be the amount of water we put in the two-liter bottle. Prior to heading outside to launch the bottle rockets, students discussed their thinking and made predictions related to which amount of water, 0 mL, 250 mL, 500 mL, 750 mL, 1250 mL, or 1750 mL, would fly the highest. I went outside with each class where they launched and tested each bottle rocket. Upon returning to the classroom, we discussed observations and students generated hypotheses. This allowed the teachers and me to see the thought processes of many students (see Appendix T).

I provided each student with a final optional interest take home packet. This final packet was based on the U-STARS~PLUS lesson, Temperature Change. In this activity students were provided with a thermometer and several tasks where they could observe, measure, and hypothesize about temperature and changes to temperature.

A final set of pattern recognition tasks was provided to each classroom teacher. Again, they were encouraged to use these in the flow of their teaching. I again emphasized that the purpose was not to see how many any student got correct, but to see their thinking and help them explore effective and efficient ways to think about making sense of patterns.

Phase Four: Post Assessment and Teacher Data Collection

Summative data were gathered from student study participants during May 2021. During the week of May 10, 2021, I was able to visit each classroom to administer the NV CogAT and the NNAT3. Teachers signed up for me to conduct these sessions with their students (repeating the processes I implemented prior to the lesson sequence) through a shared document. This allowed them to minimize the impact on their instructional time. During the week of May 17, each teacher participant was asked to complete the post-survey via Qualtrics. I offered debriefing sessions to each teacher during this week to discuss any impacts or concerns.

Impact of COVID-19

As I noted earlier, throughout the implementation of my study, COVID-19 was impacting schools and society. Friendship Elementary and ECCS instituted a variety of protocols and procedures to create as safe an environment as possible. Throughout my study, students and staff were required to wear face masks and be as socially distanced as possible. While there were no noticeable impacts to my study implementation plan, it is worth noting that both students and teachers were under additional stress and some students missed school days due to quarantine.

Data Findings and Analysis

In my work with the teachers and students at Friendship Elementary, I was looking for insights and potential opportunities to level the playing field for students as it relates to being identified and offered instructional services oriented to capitalizing on their academic gifts. My

action research for transformation project looked at the impact of increased opportunities-to-learn in conjunction with two nonverbal assessments of aptitude. In reviewing the resulting data, I looked for evidence of any educational impact of the testing protocol and the learning opportunity interventions.

Research Question One

To what extent will the implementation of the U-STARS~PLUS academic talent development framework impact the representation of Black and Hispanic students within gifted services at Friendship Elementary School in ECCS?

My first research question is foundational in that, if using U-STARS~PLUS results in a the more equitable identification of students, then the burden borne by any further identification instruments would be to fine-tune an already equitable process. Identification instruments would provide an additional perspective on individual students' eligibility for gifted services rather than being the primary screening instruments. In practice, identification through the implementation of U-STARS~PLUS involved the use of the TOPS observation protocol by the teachers. My following analysis of the numeric results addresses whether the use of TOPS resulted in the racially equitable identification of students.

Grade 3

The Grade 3 teachers identified 1/16 (6.25%) Black students, 1/17 (5.9%) Hispanic students, 4/29 (13.8%) White students, and the sole Native American student through their use of the TOPS protocol during the U-STARS~PLUS implementation. The identification of the sole Native American student is worthy of note, given that this student scored at the 35%ile on the Post NNAT3 and the 55%ile on the Post NV CogAT. Looking at the disparity across the Black, Hispanic, and White students through the lens of the raw differential ratio for the Black and

Hispanic students in comparison to the White students (the number of Black/Hispanic students identified x the risk difference for identification compared to the White students; Curran, 2020), there were 1.2 fewer Black students and 1.3 fewer Hispanic students identified through the use of TOPS than would be expected if the rates of identification for all three groups were equal.

Grade 4

Duplicating the previous analysis for the Grade 4 students, the teachers identified 2/19 (10.5%) Black students, 1/22 (4.6%) Hispanic students, and 9/38 (23.7%) White students through their use of the TOPS protocol. The raw differential ratio reveals that, compared to White students, there were 2.5 fewer Black students and 4.2 fewer Hispanic students identified through the use of TOPS than would be expected if the rates of identification for all three groups were equal.

Summary of the Numeric Data

Based on the identification data, the use of U-STARS~PLUS and the TOPS protocol failed to result in a more equitable identification of students at either the Grade 3 or Grade 4 level. In fact, the racial disparity was more pronounced at the Grade 4 level than at the Grade 3 level. Worthy of note, however, is that the sole Grade 3 student of American Indian descent was identified by use of the TOPS protocol whereas this student scored well below the default cut score for gifted services on both the NNAT-3 and the NV CogAT. It would seem that, from the numeric data, the TOPS protocol has a role in fine-tuning both test instruments—in direct contrast to the roles implied by the way I posed this research question.

Qualitative Data

To shed further light on the numeric data and in keeping with my mixed methods explanatory sequential research design, the participating teachers were given a survey using

Qualtrics before and after my study. They were asked what characteristics, attitudes, behaviors, or mindsets, they looked for when considering referring a student for gifted identification. Further, they were asked which of these characteristics were the most important in their decision to refer a student.

Prior to being exposed to the U-STARS~PLUS instructional units and the TOPS protocol, participants most commonly identified depth of thought, curiosity, persistence, creativity, accuracy, ease of learning, argumentative, and an inquisitive nature as traits they look for related to giftedness (see Table 7). Other behaviors teachers looked for included being intrinsically motivated, becoming frustrated when challenged, defending their point-of-view, correcting the teacher, and being easily distracted.

When asked which of these characteristics were the most important related to perceiving giftedness in students, the participating teachers listed accuracy, intrinsic motivation, the willingness to go deeper, being curious, and being creative.

I requested the participating teachers to use the TOPS protocol during each U-STARS~PLUS lessons I facilitated, and they were also encouraged to use TOPS during their daily instruction. As mentioned previously, I gave teachers a quick reference, flip-book version of the TOPS protocol. Following the twelve weeks of the implementation of the U-STARS~PLUS and STEM lessons, teachers shared the characteristics they considered important for discerning giftedness in their students. The traits that signified giftedness to teachers were creative thinking, deep inquiry, curiosity, and rapid learning. Thus, a major difference in thinking was not apparent as a result of using the TOPS protocol. However, one participant shared that she “enjoyed this process to better understand the process and what to look for when it comes to referring students.”

Table 7

Participant Reponses Prior to Implementation

Characteristic	Number of Participants Identifying This Characteristic	Identified as Most Important
Depth of thinking	6	Yes
Curiosity	4	Yes
Persistence	2	
Creativity	4	Yes
Accuracy	4	Yes
Ease of Learning	3	
Argumentative	1	
Inquisitive Nature (Asking Many Questions)	3	
Frustrated with Challenge	2	
Defensive of Personal Point-of-View	2	
Correcting Teacher	1	
Easily Distracted	3	
Intrinsic Motivation	5	Yes

Synthesis of Quantitative and Qualitative Perspectives

My analysis of the numeric data showed that the use of the TOPS protocol along with U-STARS~PLUS and STEM lessons did not result in an increase in gifted referrals of Black and Hispanic students. However, the only American Indian student in the school population was referred despite lower quantitative testing scores.

My analysis of the qualitative data revealed the teachers' retention of their beliefs about what it means to be gifted did not show evidence of changes during the timeline of my project. While evidence has shown that universal screening along with rigorous learning experiences can result in shifts in spotting giftedness (Wai & Worrell, 2020), teacher beliefs are not likely to reveal a change within the amount of time involved in my study. On-the-job professional learning (such as implementing U-STARS~PLUS) leading to shifts in beliefs and practice are more likely to take hold when overall systems support the new learning (Shirrell et al., 2019).

The use of STEM lessons including those from U-STARS~PLUS did not result in immediate changes in teachers' views of students' giftedness, but it did seem to enhance their thinking about gifted characteristics. While their expressed beliefs did not change during the timeline of my project, they may be increasingly aware of characteristics to look for which may result in a change in teacher beliefs over time. This is evidenced by the teacher's quotation about better understanding the process for gifted referrals. As teachers focus more intently on gifted characteristics, they may see giftedness in more students. The use of active-learning opportunities from STEM frameworks including U-STARS~PLUS makes thinking and learning more visible to teachers (Coleman, 2016).

Research Question Two

To what extent will the NNAT3 paired with the nonverbal sections of the NV CogAT result in the identification of a more demographically representative gifted population?

This critical question is deceptively simple in that it invokes two distinct but associated concepts: students' scores on the identification instruments and eligibility for gifted services. My exploration of this inherent complexity begins with a discussion of the context. At Friendship Elementary and across ECCS, teachers often initiate the gifted referral process. One area I wanted to examine in my study was related to which students are being referred and to see if those data would change as a result of my work with the teachers and students. Table 8 shows some of the demographic gaps that warrant exploration. For example, Black children are approximately 25% of Grade 3 and Grade 4 students. However, only approximately 18% of the students referred for exhibiting gifted potential were Black prior to my study. Hispanic children are approximately 28% of the Grade 3 and Grade 4 enrollment and only 15% and 18% respectively of students referred for exhibiting gifted potential were Hispanic prior to my study. White children are 46% and 49% of Grade 3 and Grade 4 students respectively. However, 58% and 64% respectively of students referred for exhibiting gifted potential were White prior to my study.

As I adverted to previously, there is an intermediate step between the scores of any student on the identification instruments and a recommendation for acceptance into the gifted education program: teachers' perceptions. The elements of teachers' perceptions that are pertinent to the decisions they make to recommend or not recommend a particular student are crucial but are not accessible by reference to just students' scores. In considering the relationship among students' scores on the identification instruments and teachers' recommendations, it is

Table 8

Friendship Elementary Demographics and Identification for Gifted Services

	Black Students		Hispanic Students		White Students		
	Count	% of Grade (% Identified)	Count	% of Grade (% Identified)	Count	% of Grade (% Identified)	Total
Grade 3	16	25% (18%)	17	27% (15%)	29	46% (58%)	62
Grade 4	19	24% (18%)	22	28% (18%)	38	49% (64%)	79

Note. Based on Friendship Elementary enrollment as of May 2021.

noteworthy that teachers' recommendations changed notably during my study—as illustrated in Figure 14 (Grade 3) and Figure 15 (Grade 4).

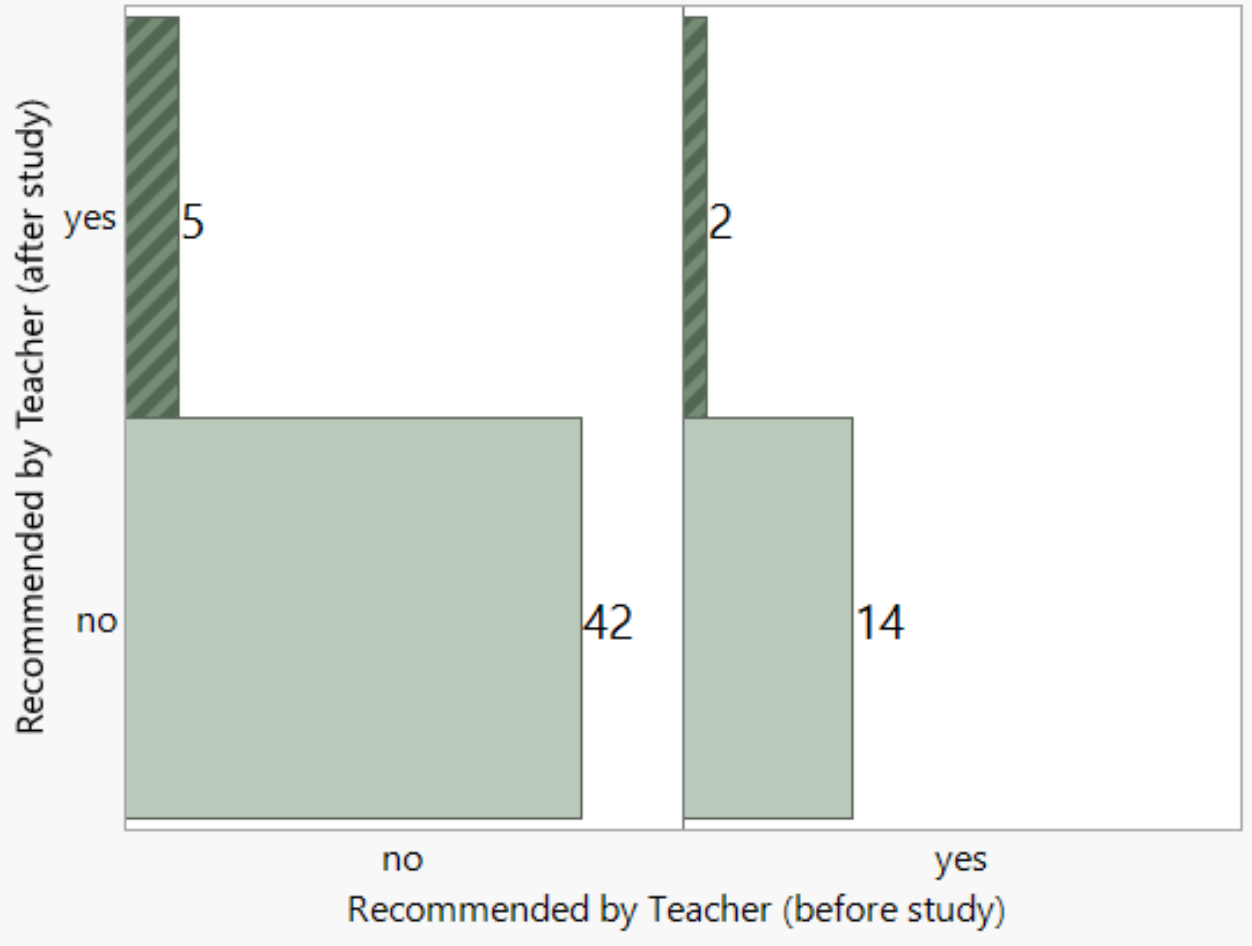
Grade 3

Figure 14 shows that 14 of the 16 Grade 3 students whom teachers recommended before the study were not recommended at the end of the study but, of the seven students eventually recommended, five had not been initially recommended.

Thus, these data show that if a student was initially not recommended, they had an 11% chance of being subsequently recommended by the teachers. One interpretation of this apparent change in perspective pre-post the study is that—with respect to Grade 3 students—the teachers did not have a good sense of the criteria for making recommendation decisions and/or how to apply them prior to the conduct of the study (they tended to identify too many students), whereas by the conclusion of the study, they revised their initial recommendation and identified students they initially did not recommend. As I point out in the following section, this apparent initial lack of a good sense of criteria and/or how to apply them was not as evident with respect to the Grade 4 students. I will return to this point after considering the relationship among the scores on the study instruments and the subsequent recommendations.

Grade 4

The changes between the beginning and end of the study for Grade 4 students are shown in Figure 15. The changes in teachers' recommendations were less dramatic than for the Grade 3 students but still only 10 of the 24 students initially recommended were subsequently recommended. However, only two students of the 55 not recommended initially were recommended ultimately. In contrast to the Grade 3 students, when it came to the Grade 4 students, the teachers tended to support their initial recommendations—presumably because they



Note. The width/area of the bars visually conveys the relationship among the outcomes.

Figure 14. Changes in teachers' recommendations: Grade 3.

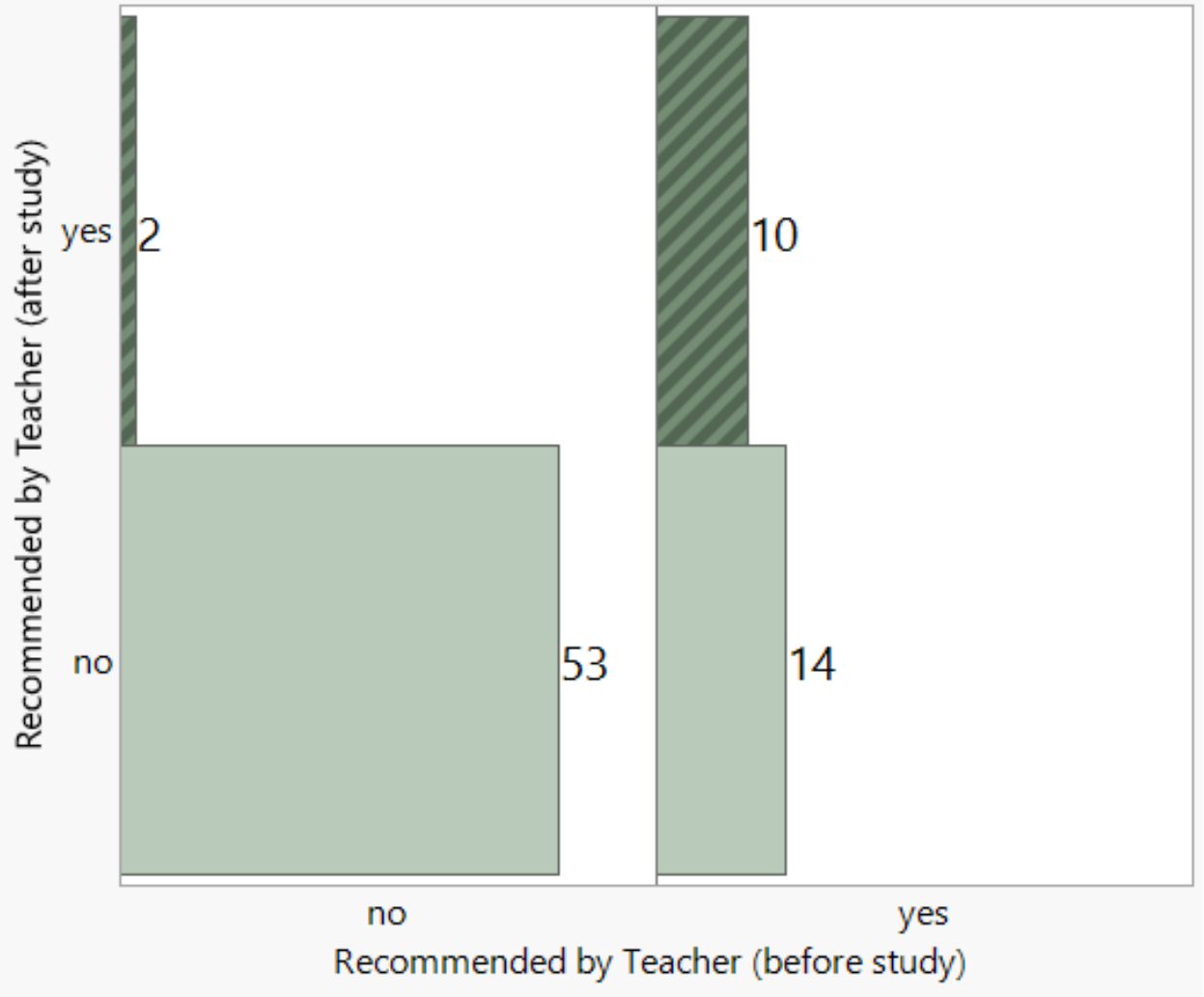


Figure 15. Changes in teachers' recommendations: Grade 4.

had a good sense of the criteria for making decisions and/or how to apply those criteria. Another factor may be that they had a better sense of students' ability after an additional year in the school environment.

Alignment of Scores on Test Instruments with Recommendations

Given that I have noted the potential for an additional qualitative factor to impact the teachers' recommendations, I now turn to the question of how closely the students' scores on the identification instruments aligned with the teachers' decisions. In this case, the predictor variable (independent variable) is continuous ("test score") and the criterion variable—the outcome for students after the study was conducted—is binary ("recommend" vs "not recommend"), suggesting a logistic regression approach (Agresti & Finlay, 1997; Gall et al., 2005; Gall et al., 2003; Sall et al., 2014).

In this instance, based on the Sall et al. (2014) discussion of logistic regression, for a given test score, the logistic probability function evaluates the probability of a student's being recommended after the study was conducted (assuming that there is no additional qualitative factor impacting the decision). Figure 16 shows the logistic regression curve for the NNAT3 raw score data (on the left) and the CogAT7_NV raw score data (on the right) for Grade 3. The x-axis shows the students' raw scores on each of the instruments and the y-axis shows the probability of a student with that score being identified for the receipt of gifted services. The points represent students and are spaced arbitrarily across the graphs (jittered) by the JMP Pro 15 software in order to show each individual student who earned each raw score. The relevant data are the position of each point in relation to the x-axis, and the probability of a student with that score being identified is the intersection of ordinate at their score and the logistic regression

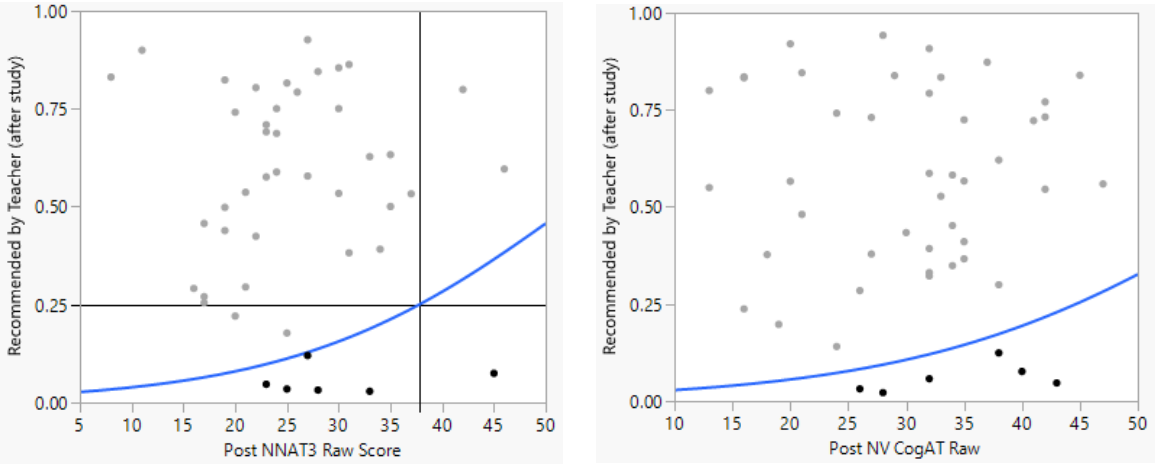


Figure 16. Grade 3 Logistic Fit of "Recommended by Teacher" (after study).

curve. For example, a student scoring about 37 on the NNAT3 had an approximately 25% probability of being identified (see the cross hairs superimposed on the graph).

As is immediately apparent from Figure 16, there are only six students identified (the points in dark black typeface below the logistic regression curve) who had both post-study NNAT3 and NV CogAT scores (one student who did not have a post-study score on either of the two instruments was recommended and is the seventh student identified in the graphic contingency table; see Figure 14). Further, there is clearly little alignment between the teachers' recommendations and the scores on either instrument. There were numerous students who scored at least as well as those who were recommended but yet were not recommended. As expected from the graphs, the R^2 whole model measure of fit (on a scale from 0% to 100%) is 5.6% for the NNAT3 and 4.6% for the NV CogAT. The students' scores on these two instruments were very poor predictors of identification.

In the case of the Grade 4 students, as shown in Figure 17, all of the nine recommended students who had an NNAT3 score also had an NV CogAT score and there were two recommended students who had only an NV CogAT score. Once again, there were numerous students who scored as well as those who were recommended but who were not recommended—including the student who had the highest score on both test instruments (note: it is the same student). The R^2 whole model measure of fit for the NNAT3 is 1.8% and 19.6% for the NV CogAT. Again, the students' scores on these two instruments were very poor predictors of identification with the NV CogAT being slightly better.

Global Perspective

From this data, it is clear that the students' scores on neither instrument align well with the current identification processes. While the NNAT3 and NV CogAT scores are highly

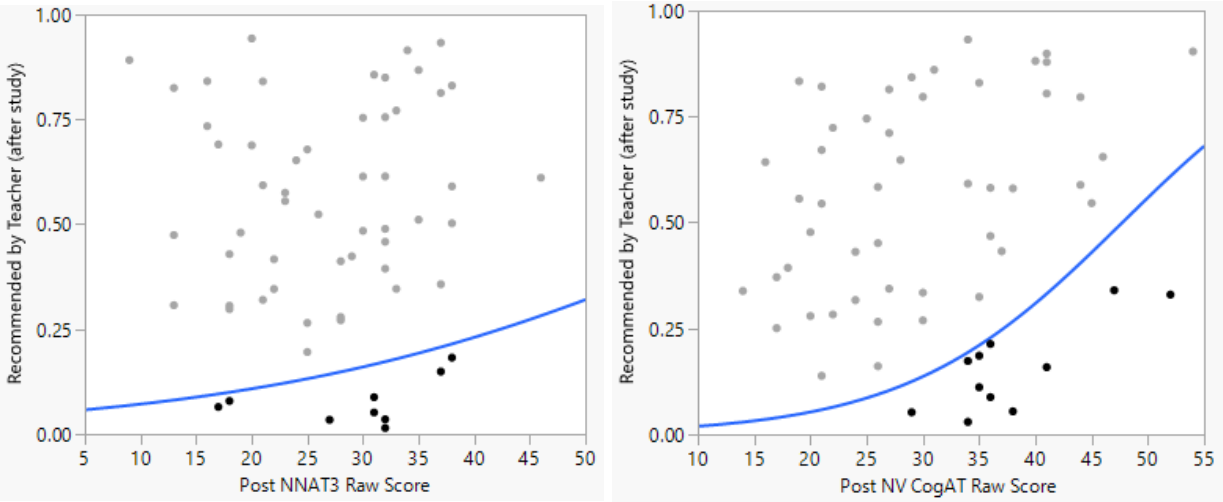


Figure 17. Grade 4 Logistic Fit of "Recommended by Teacher" (after study).

correlated (Grade 3: pre-study: r = .787; post-study: r = .787; Grade 4: pre-study: r = .767; post-study: r = .788) and this would indicate that both instruments would give rise to comparable global decisions, this is not the prime consideration. It is important to take account of the nuances that each instrument incorporates. The discordance in terms of individual student's scores on the two instruments is illustrated in Figure 18. Figure 18 graphs the rank orders of each student on the instruments. Each dot represents an individual student and, while the correlation is high (R^2 = 0.651 for Grade 3 and 0.614 for Grade 4), the discordant rank ordering of scores speaks to students' different strengths as characterized by the test instruments.

Discordant Scores by Race

One of the important considerations regarding any test instruments is whether students of different racial demographics score comparably—as I discuss in this section.

Grade 3 Students

Figure 19 compares the scores of the Grade 3 students disaggregated by race for the Post NNAT3 (left panel) and Post NV CogAT (right panel) raw scores. I have added reference lines at 10-point intervals to aid in visually comparing the scores between the two instruments and I show the scores only those students who took both tests. Hence, Figure 19 compares the scores of Black students (n = 13), Hispanic students (n = 5), and White students (n = 21) in Grade 3.

Visual comparison among the students' scores on the two instruments suggests that the Post NV CogAT tends to "lift all boats" in that, overall, there are more Black and White students in the highest score band (>40; counting the one Black student that is on the border as "in") than in the Post NNAT3. The comparison is more problematic for Hispanic students—given that there are only five students—in that one student dropped into a lower score band (10-19) on the Post NV CogAT.

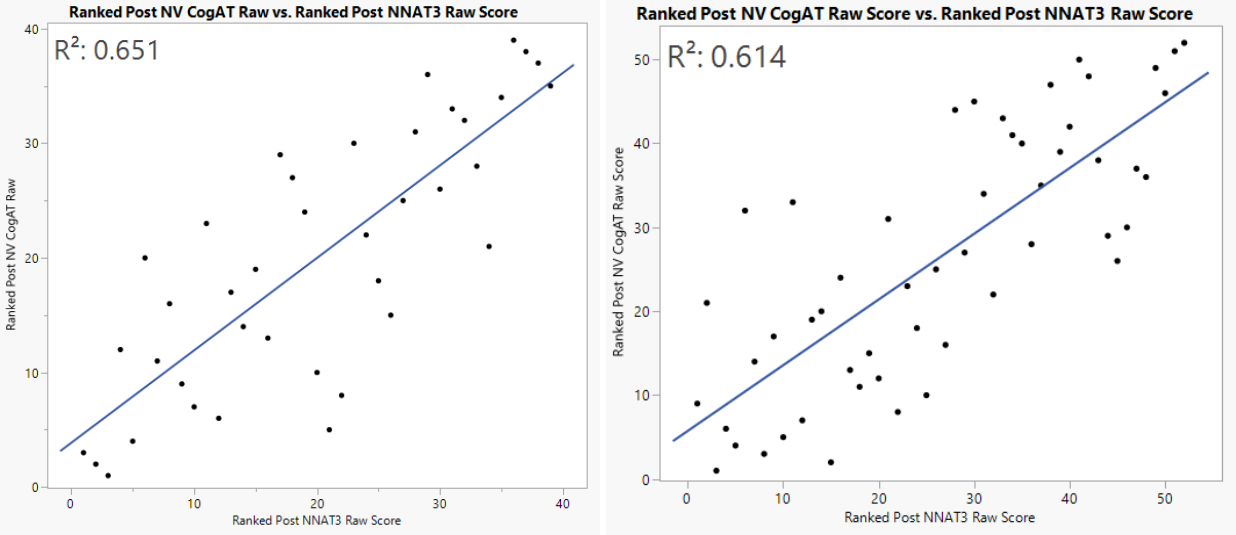


Figure 18. Discordant outcomes for individual students (Grade 3 on the left, Grade 4 on the right).

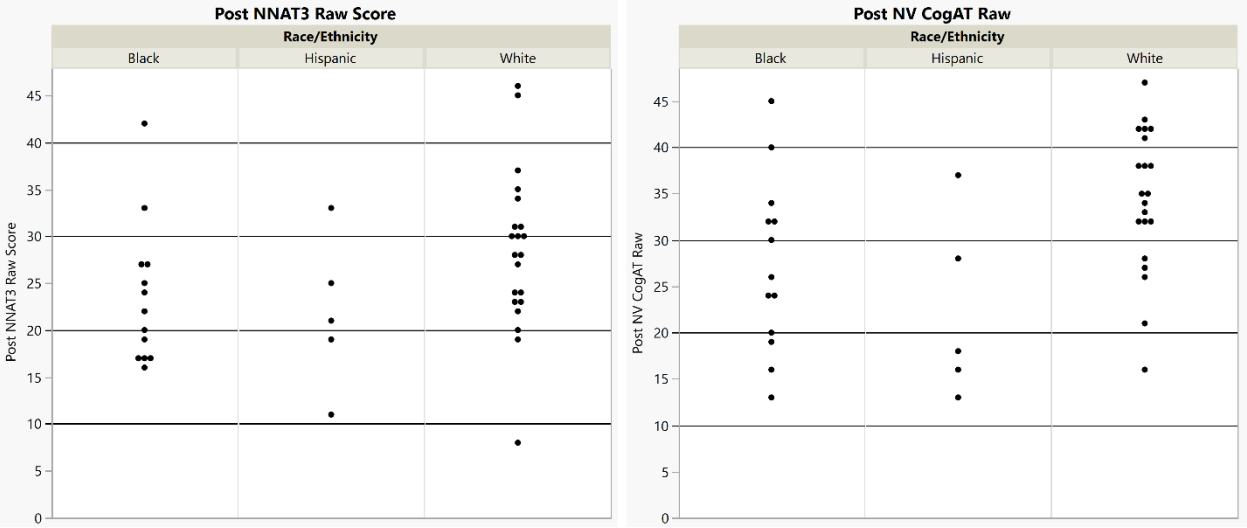


Figure 19. Grade 3 post NNAT3 raw scores (on left) and post NV CogAT raw scores (on right), by race.

However, while the results from the Post NV CogAT saw one additional Black student (7.6%) included in the >40 band and three (23%) additional students included in the 30-39 band in comparison to the outcome for the Post NNAT3, four additional White students (19%) were included in >40 band and two (9.5%) additional students were included in the 30-39 band. In other words, if "scoring better than their grade-level peers" is the criterion, from a percentage perspective, overall, Black students do about as well from participating in the Post NV CogAT as the Post NNAT3.

Further, the data reveal that students register larger scores through the Post NV CogAT. The "lift all boats" tendency (in terms of points scored) of the Post NV CogAT is illustrated more clearly in Figure 20 which shows the outlier boxplots for the Post NNAT 3 (on the left) and the Post NV CogAT (on the right). For example, the "shortest half" red bracket is notably higher for the Post NV CogAT than for the Post NNAT3. Overall, the Post NNAT3 scores exhibited a lower mean (25.9) and standard deviation (8.4) than the Post NV CogAT (30.5 and 9.5 respectively).

By way of explanation, the rectangular part of each boxplot depicts the middle half of the data (from the first quartile to the third quartile—the median is the horizontal line towards the middle of the rectangle) and the whiskers extend to the furthest points that are still within 1.5 interquartile ranges from those first and third quartiles. There are no scores beyond the ends of the whiskers, so there are no outliers. The red bracket shows the shortest half of each distribution—the shortest interval that contains 50% of the data. The middle of the central diamond represents the mean and the tips of the diamond show the 95% confidence interval (Sall et al., 2014, pp. 143-144).

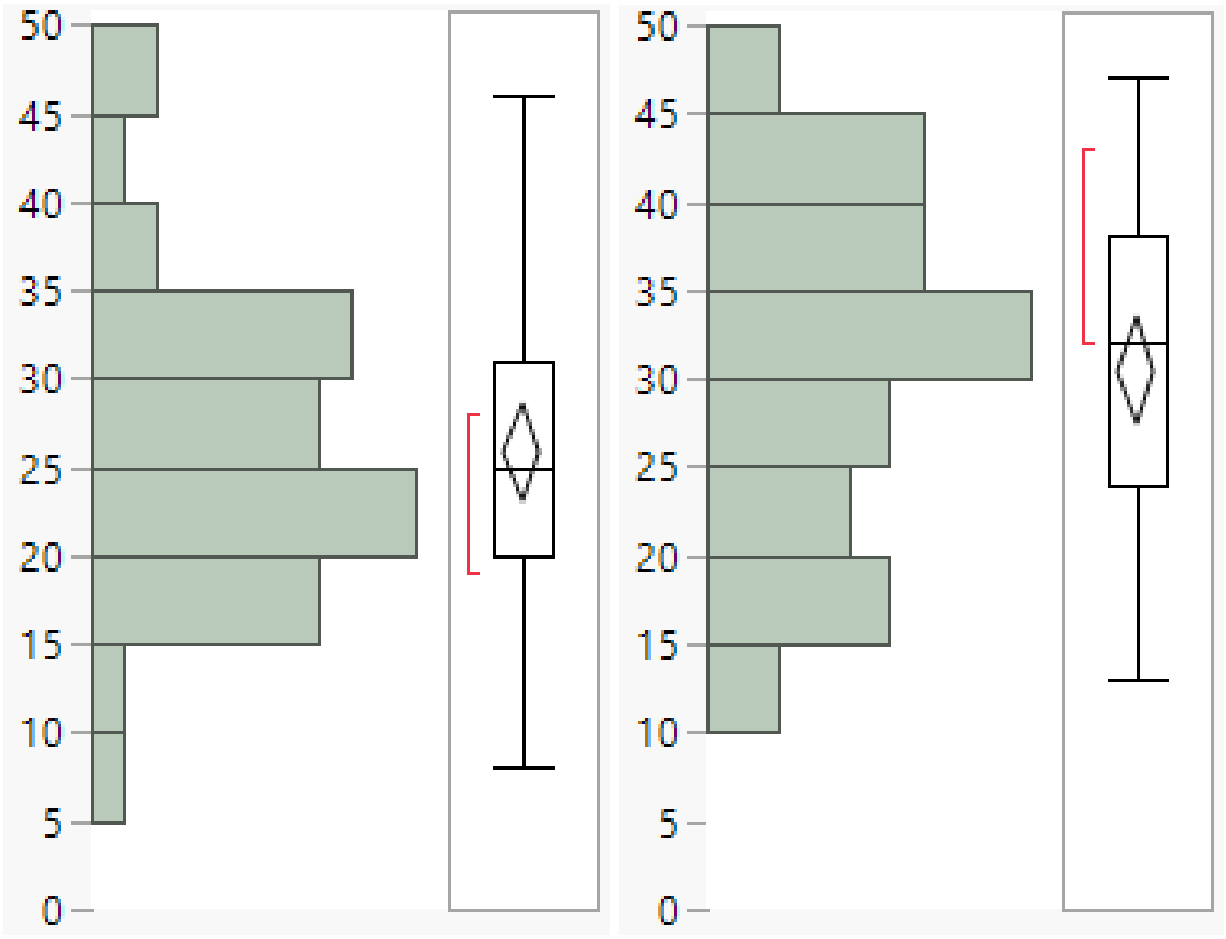


Figure 20. Grade 3 box plot comparison of scores on post NNAT3 (on left) and post NV CogAT (on right).

Grade 4 Students

Repeating the above steps for the Grade 4 students, Figure 21 compares the scores of the Grade 4 students disaggregated by race for the Post NNAT3 (left panel) and Post NV CogAT (right panel) raw scores. Again, I have added reference lines at 10-point intervals to aid in visually comparing the scores between the two instruments and shown the scores of only those students who took both tests.

Figure 22 compares the scores of n = 12 Black students, n = 14 Hispanic students, and n = 26 White students. Similar to the Grade 3 students, more Grade 4 students scored in the >40 band in the Post NV CogAT than in the Post NNAT3 (e.g., 10 students >40 in Post NV CogAT and 1 student >40 in the Post NNAT3). However, as Figure 22 shows, the overall picture is nuanced. For example, the "shortest half" of scores (the red bracket) occurs across slightly lower bars of the bar chart for the Post NV CogAT. As was the case for Grade 3, overall, the Post NNAT3 scores exhibited a lower mean (25.7) and standard deviation (8.1) than the Post NV CogAT (30.7 and 9.8 respectively).

Figure 23 shows the change in percentage of students scoring in each of the score bands for each of the ethnicities from the Post NNAT3 to the Post NV CogAT. For example, if these data were to be typical and the NV CogAT was used instead of the NNAT3, there would be an increase of 8% in the number of Black students scoring in the >40 band. However, there would also be 19% more White students in the >40 band and there would be no change in the percentage of Hispanic students in the >40 band (no Hispanic student scored in the >40 band).

Figure 23 illustrates the fraught nature of a choice between the two tests based solely on the percentage of ethnicities scoring in the various score bands. For example, if a decision was made to use the NV CogAT in Grade 4, based on these data, there would be an increase in the

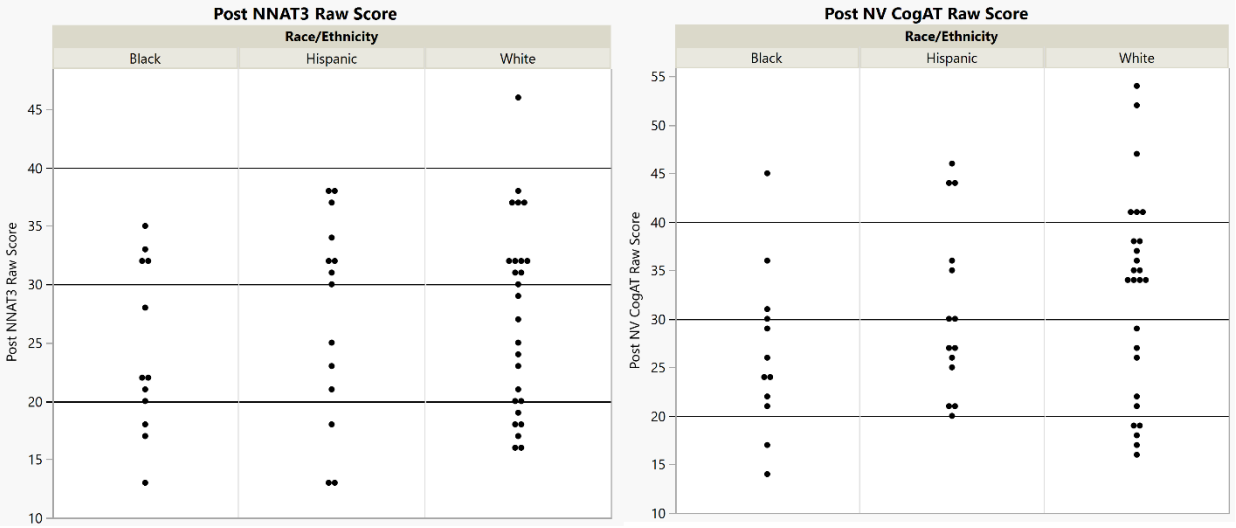


Figure 21. Grade 4 post NNAT3 raw scores (on left) and post NV CogAT raw scores (on right), by race.

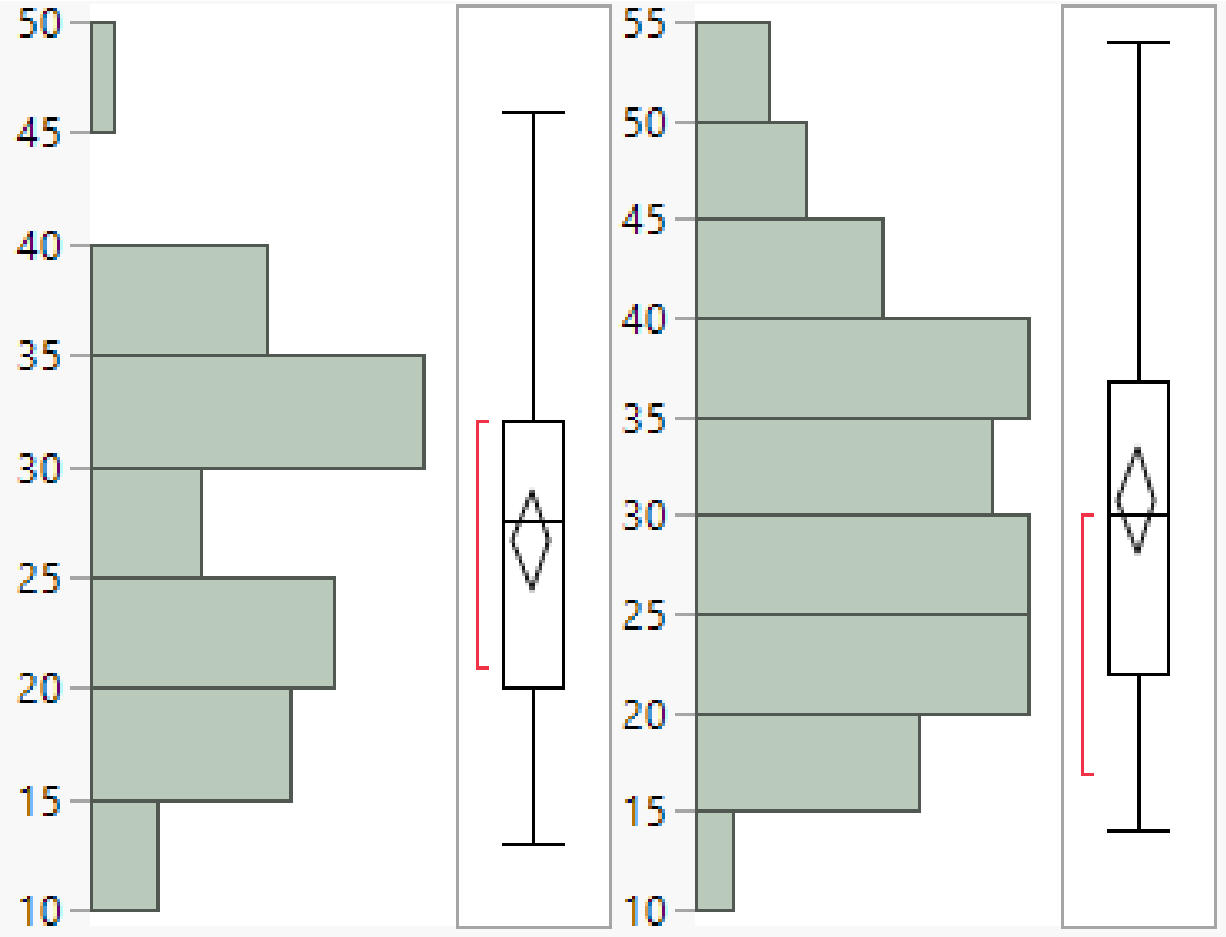


Figure 22. Grade 4 box plot comparison of scores on post NNAT3 (on left) and post NV CogAT (on right).

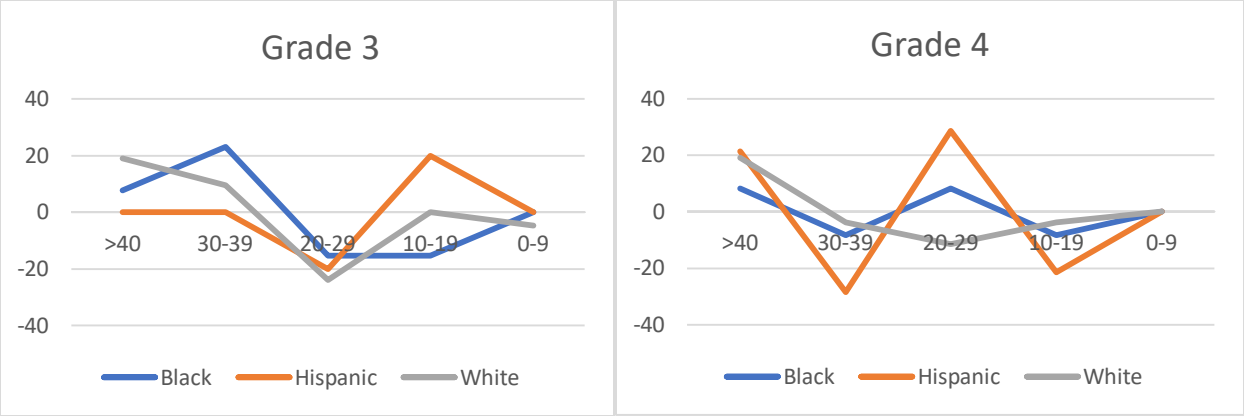


Figure 23. Changes in percentage of students in score bands (NNAT3 v NV CogAT).

percentages of all three ethnicities in the >40 score band but somewhat of a "hollowing out" of the 30-39 score band and a considerable increase of students of color in the 20-29 score band. None of these potential outcomes is undesirable, but I suggest that it would be advisable to make plans to cater appropriately for that outcome. From the analysis of the numeric data, the paramount importance of a definition of what outcome is considered desirable becomes clear.

Qualitative Perspective

At this stage, in alignment with my explanatory sequential research design, I move to nuancing the quantitative discussion by considering the more qualitative aspects of this discussion of desirable outcomes. Plucker and Peters (2017) outlined a process for reaching more students that was based on the reality that every demographic group has a top 10%. By finding and serving this top group of students, they proposed that most excellence gaps would be eliminated. As a result of the sweep-screening conducted at Friendship Elementary, I was able to identify which students scored in the top 10% of their respective racial demographic groups. The following tables outline which of these students were referred by a teacher (indicated by an asterisk). For example, in Table 9, Plucker and Peter's 10% criterion would suggest that two students should be identified. Based on the Pre NNAT3 scores, Student ID 1 was identified and was also identified by the teachers (hence the *) and the second student needed to meet the 10% criterion would be Student ID 11.

Challenges Utilizing the Top 10-percent

From Table 10, the students that comprised the top 10% of their racial group were not always in the teacher referral pool. Looking at the National Percentile Rank (NPR) for the students in the top 10% reveals the challenges with using cut scores associated with NPRs at the local level. The top 10% of each demographic group come from different percentiles when

Table 9

Meeting the 10% Criterion (Student IDs of Students "Identified")

Grade 3			
Based on	Black (n = 16; 10% = 2)	Hispanic (n = 17; 10% = 2)	White (n = 29; 10% = 3)
NNAT3 Pre	1*, 11	37*, 50*	10*, 39*, 44*
NNAT Post	9, 47*	37*, 57*	10*, 44*, 8*
NV CogAT Pre	1*, 47*	7*, 50*	8*, 44*, 39*
NV CogAT Post	31*, 47*	20, 57*	8*, 10*, 44*
Grade 4			
Based on	Black (n = 19; 10% = 2)	Hispanic (n = 22; 10% = 2)	White (n = 38; 10% = 4)
NNAT3 Pre	69*, 90	64*, 117*	75*, 100, 104*, 121*
NNAT Post	77*, 90	64*, 117*	75*, 100, 105*, 121*
NV CogAT Pre	69*, 90	64*, 122	75*, 100, 121*, 139*
NV CogAT Post	77*, 90	64*, 117*	96, 109*, 105*, 132

Table 10

NPR Range of Students in the Top 10%

		Black Students NPR %ile Range	Hispanic NPR %ile Range	White Students NPR %ile Range
Grade 3	NV CogAT	86 to 98	55 to 97	84 to 94
	NNAT3	84 to 86	82 to 98	83 to 99
Grade 4	NV CogAT	62 to 93	92 to 95	84 to 99
	NNAT3	60 to 71	83 to 87	77 to 99

compared to the national population (see Table 10). At Friendship Elementary, using the district's 92nd percentile cut score for the NV CogAT or NNAT3 as a single measure, each demographic group except one, Grade 4 Hispanic, would not include students in the top 10%.

Alternative View on Implications of the Top 10-percent

An additional way to consider who the top 10% includes is to examine the raw scores a student in my study achieved. As illustrated in Figure 24, in Grade 3, a Black student with a raw score of 38.4, a Hispanic student with a raw score of 35, or a White student with a raw score of 42.6 was in the top 10% for their demographic group on the NNAT3. Again, in Grade 3, a Black student with a raw score of 43, a Hispanic student with a raw score of 36.6, or a White student with a raw score of 42.5 was in the top 10% for their demographic group on the NV CogAT. Along the same lines, as shown in Figure 25, in Grade 4, a Black student with a raw score of 35, a Hispanic student with a raw score of 38, or a White student with a raw score of 37.9 was in the top 10% for their demographic group on the NNAT3. In Grade 4, a Black student with a raw score of 41.4, a Hispanic student with a raw score of 44.2, or a White student with a raw score of 47.5 was in the top 10% for their demographic group on the NV CogAT.

Individual Student Variation Across Test Instruments

The above discussion raises the issue of whether there were students who had quite different scores on the NV CogAT and NNAT3 and whether there were any characteristics they had in common. To answer this, I calculated the absolute value of the difference between the scores on the two instruments for all students and selected those students whose scores on the two instruments differed by 10 or more points (arbitrarily imposing an operational definition of "quite different").

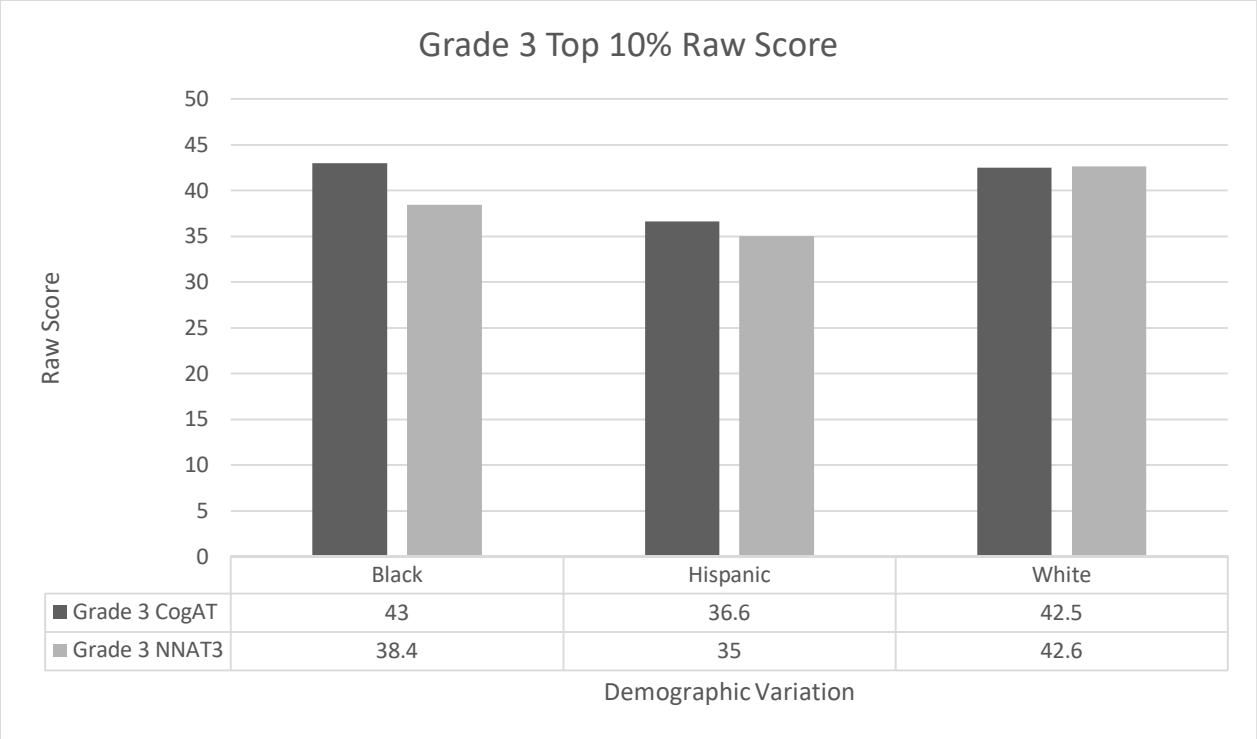


Figure 24. Grade 3 NPR range for students in the top 10%.

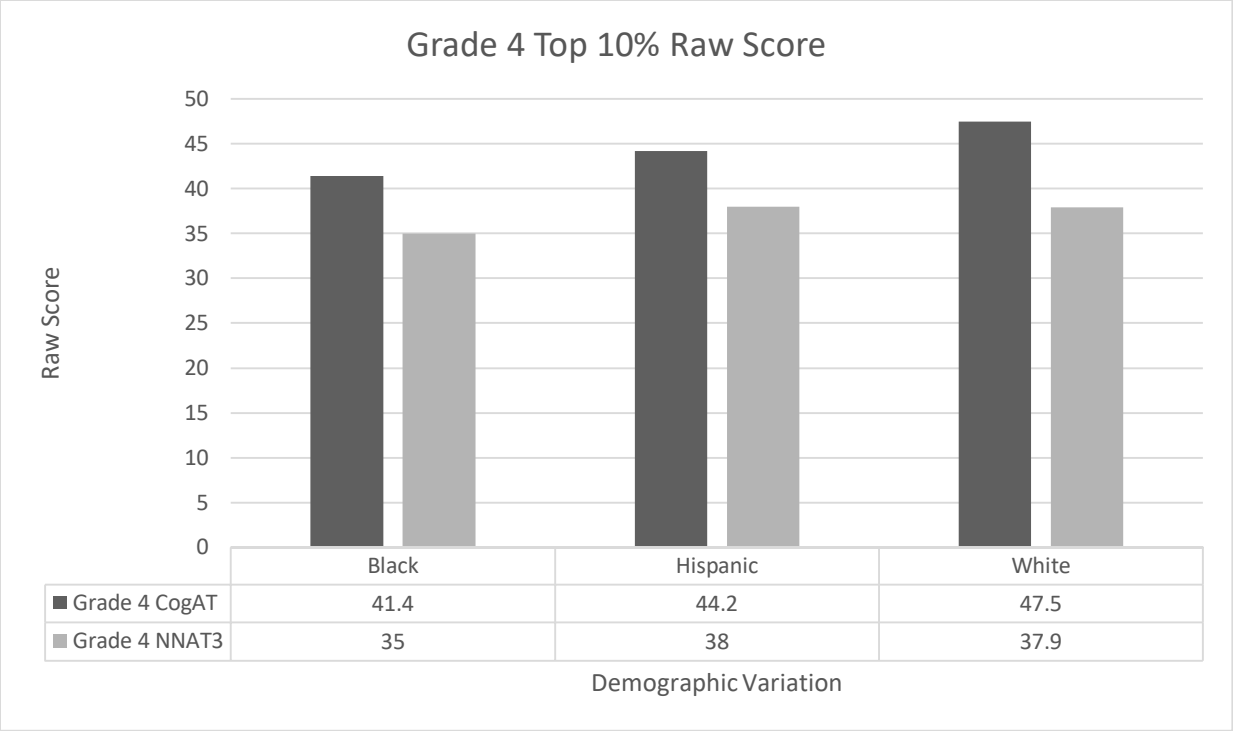


Figure 25. Grade 4 NPR range for students in the top 10%.

Grade 3

As shown in Figure 26, there were nine students in Grade 3 who had scores that differed by 10 or more points (ranging from 10 to 15 points). The nine students were divided evenly across three classes (teachers' names are pseudonyms). The majority of them were male (second panel), White (third panel), and not identified either before or after the study (fourth and fifth panel). However, the variability across these characteristics is illustrated by tracking the one student who was identified after the study across the other characteristics (identified by the shaded bars). This student was female and White and was not identified before the study.

Grade 4

Figure 27 shows that the majority of the 11 students in Grade 4 whose scores differed by 10 or more points (ranging from 17 to 10 points) were in Hotel's class (the teacher's pseudonym; first panel on the far left). The majority of them were female (second panel) and White (third panel), and a bare majority of them were not identified either before or after the study (fourth and fifth panel). Focusing on the five of these students who were identified after the study, four of them had been identified before the study, all of them were White, three of them were female, and all of them were in Hotel's class—a finding that warrants further investigation

In summary, it seems to me that the only characteristic shared across grade levels among the students whose scores on the two instruments were quite different was that they were White. At the Grade 3 level, the majority were male, but that was reversed at the Grade 4 level. They were evenly distributed across the classes at the Grade 3 level but concentrated in one class at the Grade 4 level. As already mentioned, the concentration of those who were identified after the study in the one class (Hotel's) may have been just by happenstance, but it warrants further investigation.

Figure 26. Characteristics of Grade 3 students whose scores differed by 10 or more points.

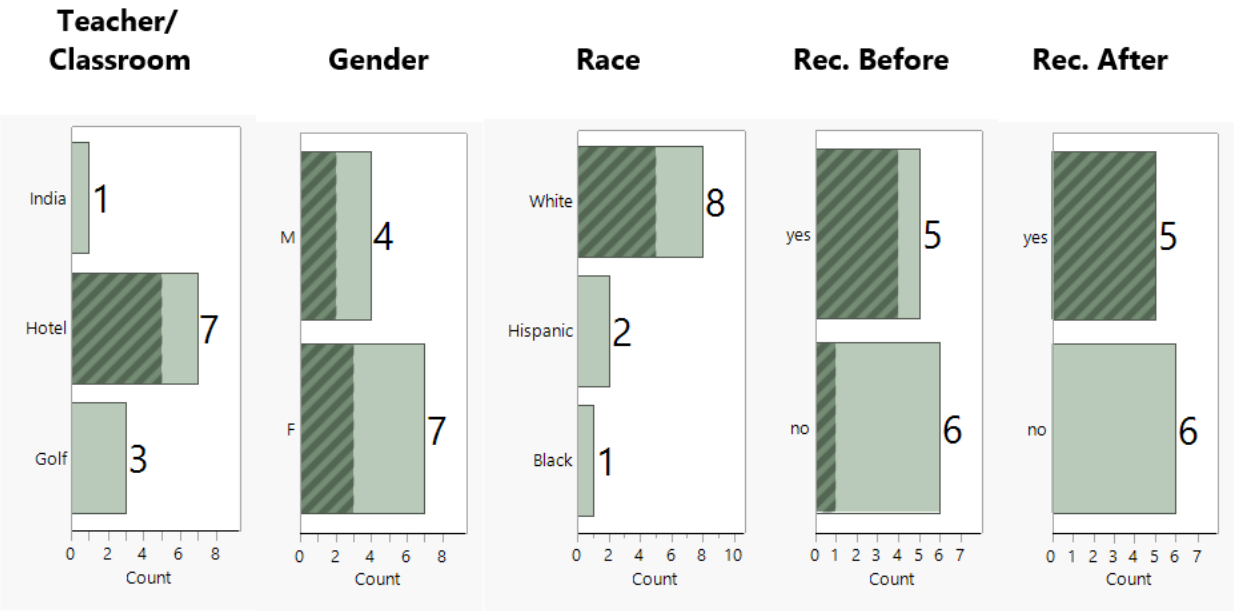


Figure 27. Characteristics of Grade 4 students whose scores differed by 10 or more points.

Localization of Greatest Improvement Scores

In Figures 19 and 21, I arbitrarily divided the raw score range for both instruments into 10-point bands and discussed achievement across those bands. I now turn to the question of in which of those 10-point bands the greatest pre-post increase occurred on each instrument. To answer this question, I subtracted the "Pre" scores from the "Post" scores and graphed the resultant "gain/loss" difference against the "Pre" score for each of the two instruments.

Grade 3

As shown in Figure 28, the tendency was for students who scored highest on the "Pre" study administration to score slightly worse on the "Post" study administration of both instruments across the score range. This tendency was not statistically significant in either case. That said, two of the highest scoring students on the Pre NNAT3 also made the greatest pre-post gains (see the two points in the top right corner of the panel to the left). By contrast, students who scored in the midrange of the NV CogAT appeared to post the highest pre-post gains (note the different scales on the gain axes).

Grade 4

As shown in Figure 29, the same overall pattern held for the students in Grade 4 as for the students in Grade 3 and, again, the tendency is not statistically significant in for either instrument. However, the top scoring Grade 4 students barely improved pre-post.

Demographics of Students Who Made the Greatest Improvement

I now move on to investigating the final nuance of Research Question Two that I will address: What were the demographics of the students whose scores on the two instruments showed the greatest growth. I am interpreting "growth" as the gain/loss scores I already

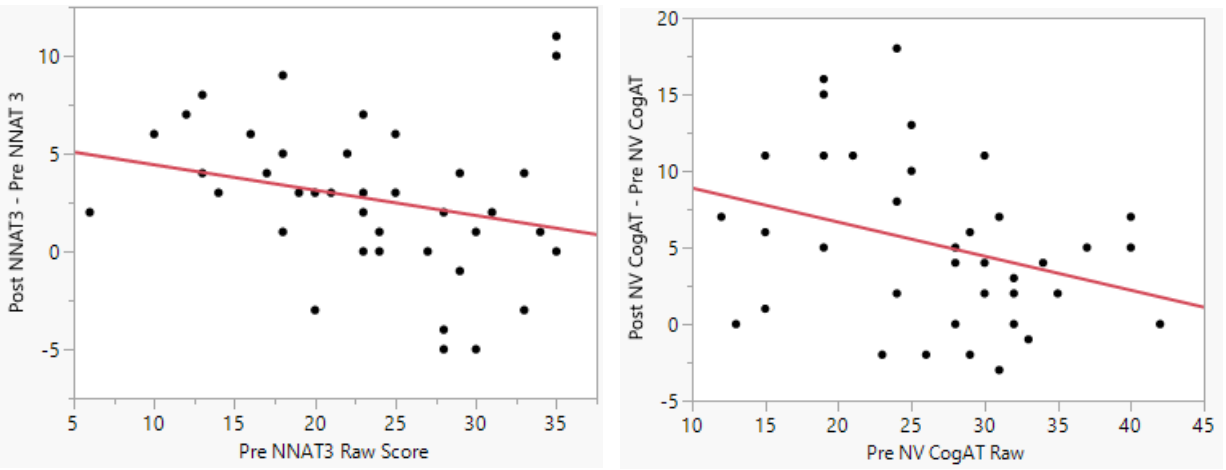
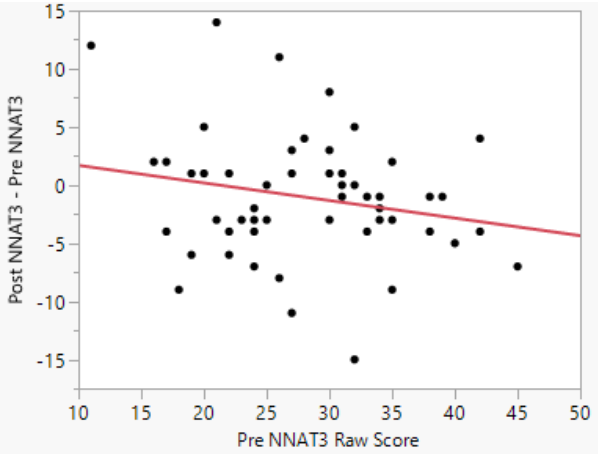


Figure 28. Grade 3: Relationship between "pre" study scores and gain/loss scores.



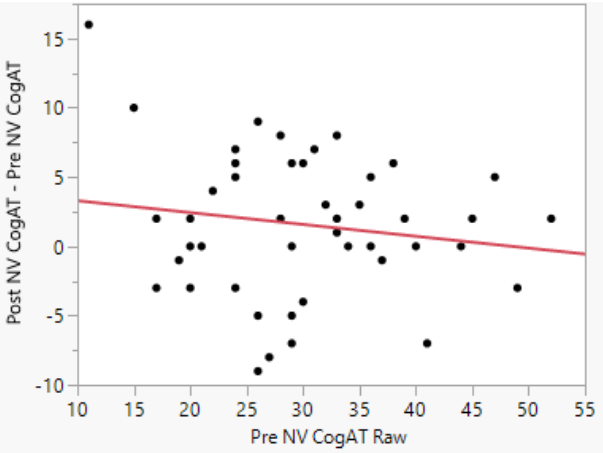


Figure 29. Grade 4: Relationship between “pre” study scores and gain/loss scores.

generated by subtracting the "Pre" scores from the "Post" scores and I am operationally defining "highest growth" as the top 10 growth scores.

Grade 3

I begin by considering how the students with the highest growth scores on each instrument in turn fared on the other instrument. Sorting on the NNAT 3 gain/loss score reveals that the highest growth score was 11 and the 10th and 11th-highest growth scores (two-way tie) were both five. These growth scores are shown on the x-axis in the left-hand panel in Figure 30. The y-axis shows the growth scores on the NV CogAT for the same 11 students. (Because the 2nd, 3rd, 4th, and one of the 10th-highest scorers on the NNAT3 did not have growth scores for the NV CogAT, there are only seven students' scores plotted in the left-hand panel of Figure 30.) The most frequent growth score on the NV CogAT among this group of seven students was zero.

Sorting instead on the NV CogAT growth score reveals that the highest growth score was 18 and the 10th-highest score was 8 (two of these students did not have a growth score for the NNAT3 so the right-hand panel plots eight students). As shown in the right-hand panel of Figure 30, the most frequent growth score on the NNAT3 among this group of students was 3.

Figure 31 shows the demographic breakdown of the students with the 10 highest growth scores on the NNAT3 (left-hand panel grouping) and NV CogAT (right-hand panel grouping). In each case, the most frequent racial/ethnic category (White for both instruments) is highlighted and in both cases male students predominate.

Grade 4

Using the analogous approach to the above, I begin by graphing the growth scores of the 10 students with the highest NNAT3 growth scores against their growth scores on the NV

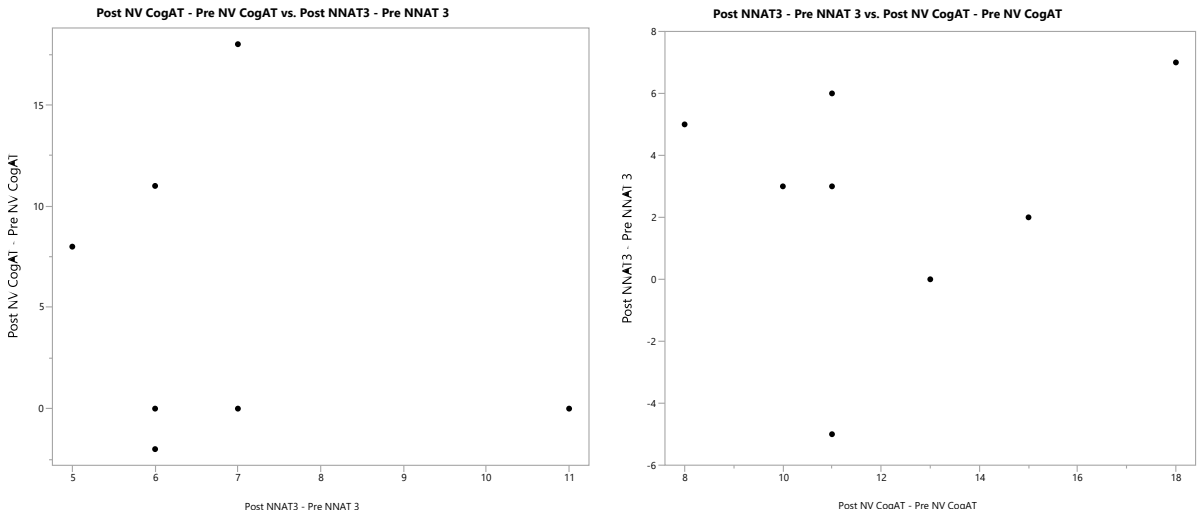


Figure 30. Grade 3: Comparison of growth scores of top 10 students on each instrument vs. the other.

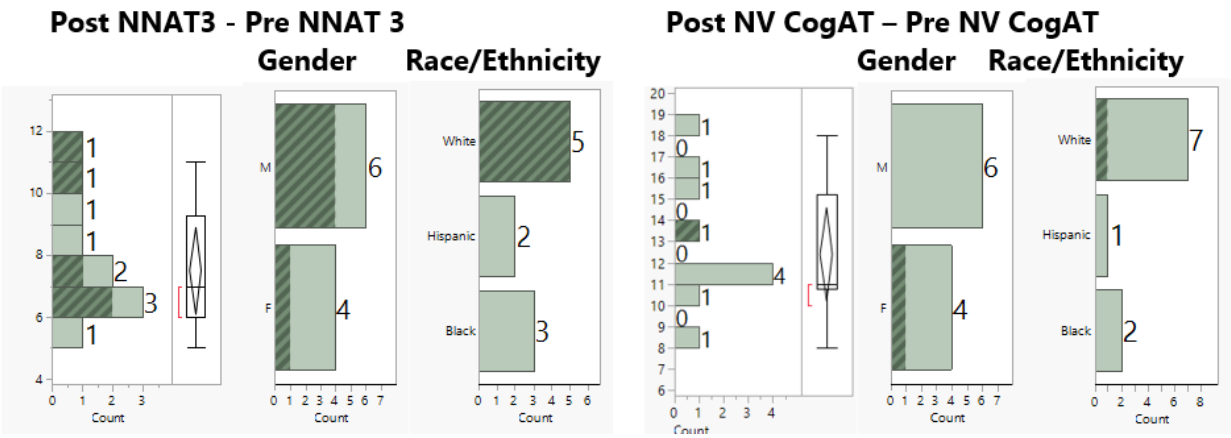


Figure 31. Grade 3: Demographic breakdown of the 10 highest scoring students.

CogAT (left-hand panel in Figure 32) and vice versa (right-hand panel in Figure 32; there were 11 students in the case of the NV CogAT due to a two-way tie). There are seven data points for the NNAT3 and nine for the NV CogAT due to absences of growth scores for all students. For the NNAT3, the most frequent growth score for the NV CogAT was six but there was no multiple frequency on the NNAT 3 for the top growth scorers on the NV CogAT.

By way of contrast to the situation in Grade 3, as shown in Figure 33, the demographic breakdown of the students shows that Hispanic students predominate and there is a more even breakdown across the genders on both instruments. These data deserve some discussion. It is possible that this finding is an artifact of this cohort of Grade 4 students, but it is also possible that my intervention was more effective in enabling the Hispanic students in Grade 4 to score better on the post-test of both instruments than it was at the Grade 3 level. If the latter explanation is feasible, it attests to the potential for my intervention to somewhat level both the gender and race/ethnicity playing fields.

Research Question 3

To what extent will changes in teachers' U-STARS~PLUS-informed referrals align with participating students' results on the NNAT3 and NV CogAT?

As discussed, five Grade 3 students who were not originally recommended by the teachers were recommended after my study. On the other hand, 14 students who were originally recommended were not ultimately recommended. For Grade 4, 10 students were recommended both originally and finally, 14 students were originally recommended but not finally, and two students were finally recommended even though they were not recommended originally. Figure 34 summarizes the pairs of scores for each student in each of the three categories of recommendation. I have used the high and low score among those finally recommended to parse

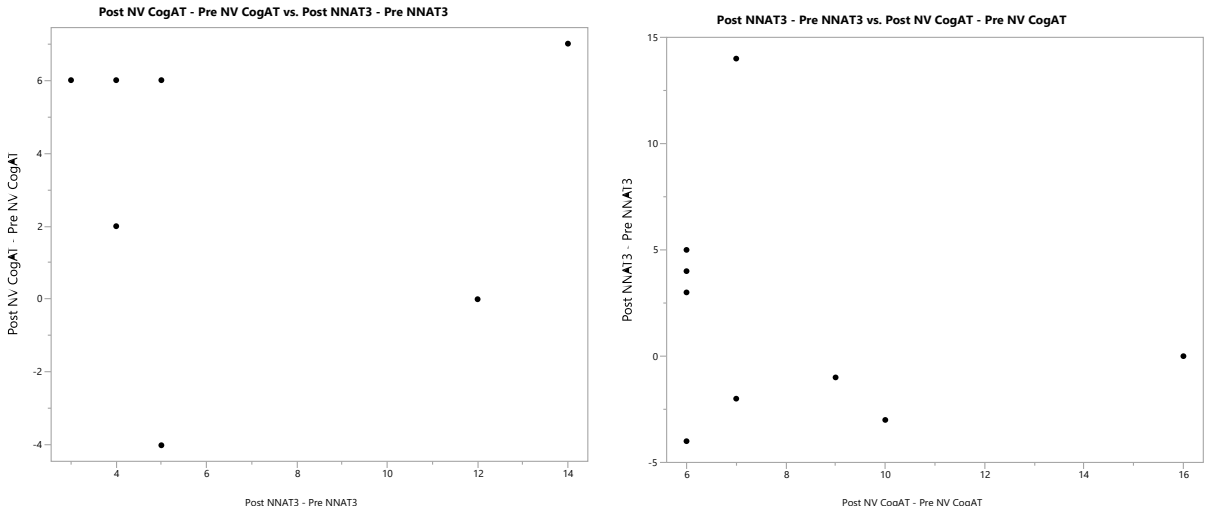


Figure 32. Grade 4: Comparison of growth scores of top 10 students on each instrument vs. the other.

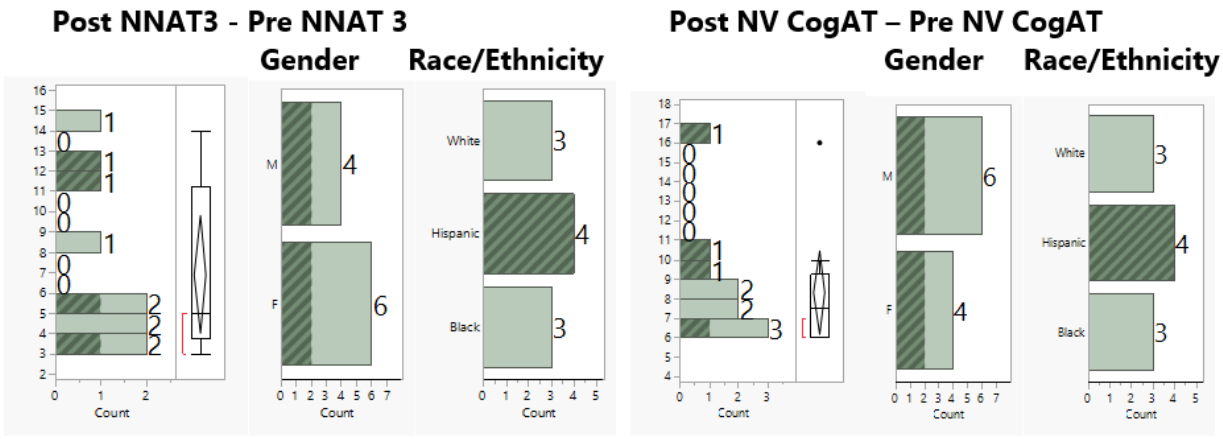


Figure 33. Grade 4: Demographic breakdown of the 10 highest scoring students.

	Grade 3		Grade 4	
Recommended	NNAT3	NV CogAT	NNAT3	NV CogAT
Originally & finally	28	28	absent	36
	43	45	absent	absent
			absent	35
			37	36
			27	29
			32	35
			31	41
			38	52
			32	47
			17	34
Originally not finally	absent	absent	~~26~~	absent
	absent	~~26~~	38	absent
	absent	~~23~~	absent	absent
	absent	35	absent	absent
	absent	absent	absent	~~26~~
	32	34	~~21~~	~~21~~
	45	42	~~16~~	~~17~~
	42	46	~~22~~	~~21~~
	34	30	~~16~~	~~19~~
	37	33	37	34
	32	27	32	35
	42	35	38	44
	47	37	38	46
	41	31	33	45
Not originally but finally	absent	absent	32	38
	~~26~~	~~23~~	~~18~~	34
	40	33		
	32	~~25~~		
	38	~~27~~		

Note. Pairs of scores on the same row are from the same student.

Figure 34. Relationship Among Scores for Students in Categories of Teacher Recommendations.

the scores of the students in the other two categories: a struck-out score indicates it is below the low score of those finally recommended, a score in green font indicates it in within the range of the high and low score of those finally recommended, and a score in red font indicates it is above the high score of those finally recommended. From Figure 34, there is little relationship among changes in teachers' recommendations and students' scores on either of the test instruments.

Summary

My partnership with Friendship Elementary allowed me to work directly with students, teachers, and administrators. Embedded within the day-to-day operations of the school, I was able to explore the three research questions proposed in my project while also learning alongside participating teachers. Utilizing a mixed methods explanatory sequential research design allowed me to examine the impact of nonverbal assessments along with STEM-based instructional units. Insight came as a result of looking at quantitative data first and then delving more deeply using qualitative responses.

Synthesizing my findings from my analysis of the data, I conclude that:

- Teacher ideas of gifted characteristics did not change in the amount of time we had together. Further professional learning along with time and greater exposure to the students may lead to different results. In this regard, it is noteworthy that the recommendations teachers made with respect to the Grade 4 students were more stable than with respect to the Grade 3 students.
- Universal sweep screening of students using nonverbal assessments did reveal gifted potential in students from various backgrounds.

- Utilizing universal sweep screening to identify local norms and the top 10%within demographic groups is possible. These students may not be noticed using traditional referrals or instructional interventions alone.
- Implementing a STEM-based talent-development framework during the relatively short period of time in my project resulted in an increased number of recommendations focused on different students than prior to my study.
- Administering the NV CogAT resulted in more diverse students scoring at higher levels than the NNAT3.

Combining universal sweep screening, teacher observations, and talent development through STEM-based instructional units cast a wider net for creating talent pools for gifted referrals or identification. In the following chapter, I will use the findings from my action research for transformation project to propose certain recommendations for future practice as well as generate questions for future collaboration and study. I will explore the results related to each of my research questions and elaborate on potential transformation of future practice at Friendship Elementary and across the ECCS.

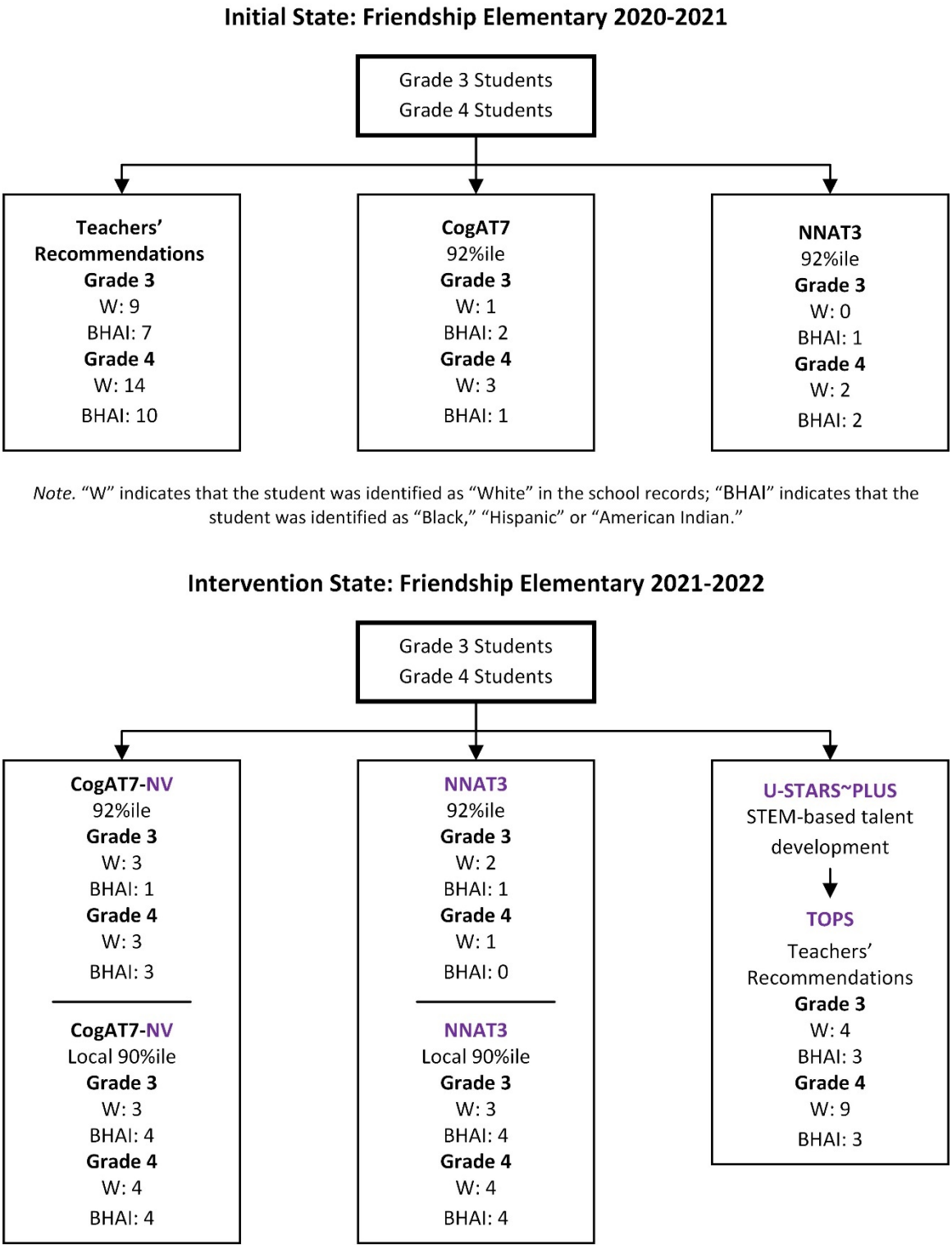
CHAPTER 5: SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Immersing myself in the daily lived experience of Grade 3 and Grade 4 teachers at Friendship Elementary allowed me to engage in this action research for transformation project. Spending large portions of school days over half of the school year created a situation where I could learn from teachers, learn about students, and gain insight into how to create structures to create a more level playing field for identifying gifted students at Friendship Elementary and potentially across East Carolina County Schools (ECCS).

Throughout this chapter, I review the problem of practice surrounding referrals of students from Black, Hispanic, and White backgrounds, explore implications of the data, make recommendations for future practice across ECCS, and suggest areas for further research and study. Figure 35 provides perspective on the initial state of being and the final outcomes of my action research for transformation. Collecting teacher recommendation data as well as scores on nonverbal assessments of Grade 3 and Grade 4 students provided me insight into the effectiveness of interventions I facilitated. I discuss the implications of my interventions throughout this chapter.

Academically Gifted Referrals and Identification

The process of being identified for gifted services at Friendship Elementary and across ECCS begins with screening and referral. Screening and referral play important roles and seek to ensure that students who require gifted services have access. Screening entails gathering data—typically from previous testing, classroom performance, exams, and observations. Screening is most often conducted by the gifted specialist but can also be completed by a classroom teacher, parent, or student. The goal of screening is to create a talent pool for testing. The referral process may be the result of screening such as this or simply a request for further testing. A referral may



Note. "W" indicates that the student was identified as "White" in the school records; "BHAI" indicates that the student was identified as "Black," "Hispanic" or "American Indian."

Figure 35. Overview of initial and intervention state of action research for transformation.

be completed using a form (see Appendix R). Referrals can be made by any adult who has knowledge of the child (e.g., teacher, parent, coach, tutor), a peer, or a student themself.

The Match Team, comprised of the gifted specialist, classroom teacher or teachers, school counselor, and school administrator then determines which students are tested for possible identification. ECCS district leadership provides guidance to Match Teams that students should be given the opportunity to participate in testing unless the testing will cause an undue burden on the child, if the child has been tested multiple times before, or some similar reason can be given why the child should not be given the opportunity to take the tests. Parents must consent to testing before administration can commence. In ECCS the Iowa Assessments (https://www.mercerpublishing.com/iowa-assessments/ along with the Cognitive Abilities Test (CogAT; https://www.mercerpublishing.com/cogat/) are most commonly administered to students.

Following testing, motivation scales are collected from the parent or guardian, classroom teacher, or other adults who know the child. Additionally, evidence of current academic progress is collected. These evidences may include report card grades, classroom test scores, diagnostic assessment results, or any other work which demonstrates achievement. Students can be identified via multiple pathways, but each pathway requires at least one qualifying score on either of the standardized assessments administered by ECCS.

ECCS does not currently offer universal (commonly referred to a “sweep screen”) testing to students. Therefore, to access gifted services testing, students must be referred or nominated through the screening process outlined above. In my action research for transformation project, I examined the use of nonverbal assessments of aptitude along with STEM-based talent development instruction in a sweep screen approach. ECCS also utilizes national norms when

making decisions for gifted placements. Students must reach the 92nd percentile to have a qualifying score. This has resulted in challenges and students being left out of gifted services as I will outline in the sections that follow.

Proportional Representation in ECCS and Friendship Elementary

While the numbers of identified students from any demographic group of students may vary, students should be proportionately identified across groups. The National Association for Gifted Children (NAGC, 2019) defines giftedness in students based on comparison of peers within age bands and backgrounds. Article 9b (North Carolina Academically or Intellectually Gifted Students, 1996/2018) instructs districts within North Carolina to consider the experiences and potential of students from across all cultural groups. The data related to the representation of Black, Hispanic, Native American, and White students within the identified gifted population in ECCS that I researched at the outset of my study revealed that gifted identification practices fail to achieve proportional representation.

In Chapter 1, I shared Risk Ratio (RR; proportion of students of interest/proportion of comparison students) and Raw Differential Representation (RDR) calculations (Curran, 2020; see Table 1) for each ECCS school. Using White students as the comparison, the RR ranged from 0 (no chance of being identified in five schools; Schools 2, 10, 11, 13, & 20) to 1.11 (a slightly better chance of being identified than White students in one school; School 6) for Black students and from 0 in School 13 to 1.48 in School 10 for Hispanic students—the latter being also one of the schools in which Black students had no chance of being identified. In School 13, neither Black nor Hispanic students had any chance of being identified while nearly one in six White students was identified. Only one elementary school out of 20 achieved proportional representation for Black students and three elementary schools reached this threshold for

Hispanic students. As identification leads to increased services by the gifted specialists at the schools, this created a problem of practice worthy of study.

By way of review, in selecting Friendship Elementary, I considered four main factors: (a) a lack of proportional representation for both Black and Hispanic students, (b) multiple Black and Hispanic students enrolled at the site, (c) a willing administrative team, and (d) geographical proximity to my work location. The RR for Black students at Friendship Elementary was .13 which translated to a RDR (underrepresentation) of more than 6 students. This indicated that, in a strictly equitable context, at least 6 more Black students should have been identified. Similarly, Hispanic students at Friendship Elementary had a RR of .43 which indicated that more than 5 students were being overlooked. When I approached the administrative team with my problem of practice, they were eager to learn more and seek solutions that could benefit their students, families, and staff. To reprise my earlier discussion, the Grade 3 and Grade 4 teaching teams were similarly vested and willing to collaborate.

Role of Talent Development and Assessments

Carman et al. (2020) found that the use of nonverbal assessments did not achieve proportional representation in giftedness among kindergarten students. However, others (Cao et al., 2017; Card & Giuliano, 2016; Ford, 2015; Giessman et al., 2013; Lohman, 2005; Naglieri & Ford, 2015; Wai & Lakin, 2020) have shown that the use of nonverbal assessments can be more sensitive to certain demographic groups. The idea of pairing the use of potentially more sensitive nonverbal instruments with Plucker and Peters' (2017) idea that 10% of each demographic group should be identified provided the conceptual framework for my study.

However, assessment alone has not been shown to be achieve proportional representation (cite). Hodges et al. (2018) pointed to portfolios and checklists in addition to nonverbal

assessments as more likely to lead to proportional representation. In my action research for transformation project, I paired the use of the NNAT3 and the CogAT7-NV with a STEM-based talent development resource (U-STARS~PLUS). U-STARS~PLUS provides literacy resources, STEM-based activities, and a comprehensive talent-spotting checklist. The checklist provides teachers with a variety of behaviors to look for, both positive and negative, which may indicate giftedness in students. Pairing nonverbal assessments with STEM-based talent development was an approach that allowed me to explore a new avenue for insights into how to achieve proportional representation.

Intention of Action Research for Transformation

Bradbury et al. (2019) shared a rationale and a method for recalibrating the importance of research being done alongside and with rather than to participants. Working in a school setting requires, by its very nature, that a researcher interacts with a social environment comprised of many interconnected relationships. For my work to be meaningful, collaborative, and have a lasting impact, I needed to be part of the school community. My aim in this work was to initiate a process of change and to evaluate the impact of the change to influence future decision making. Ultimately, I wanted to create a playing field where equitable proportions of gifted students could have access to the services that they need to achieve their potential.

My gaining perspective on the significance of the problem of disproportionality in gifted identification was fundamental to demonstrating this as a worthy topic for study. Curran's (2020) use of risk ratio (RR) and risk difference (RD) to show disproportionality, and raw differential representation (RDR) to provide perspective on that disproportionality (each measure described earlier) allowed me to quantify the number of students being overlooked at each elementary school in ECCS and specifically at Friendship Elementary. For the sake of my study, the risk was

the risk of being identified as gifted (assumedly a positive or desirable risk). Ultimately, I invited Friendship Elementary to partner with me in this work. The school's data revealed an RDR of -6.67 for Black students and -5.33 for Hispanic students.

Establishing Partnerships

Partnership development was a three-phase process. I established basic rapport with administration and teachers through brief meet-and-greet sessions I held at the school. The real relationships began to develop during both informal and formal sessions when I led teachers through the current data and discussed my problem of practice. These sessions and then meeting their students allowed our relationships to grow beyond my being simply a visitor in the building. Finally, by spending time weekly both observing and instructing students in classrooms, I was able to both see the work of the teacher participants and they could see my attempts at talent development. During these times, we had many rich and fruitful discussions around assessments of giftedness as well as talent development. Being in the classroom working directly with classrooms of students also allowed me to become more than a visitor to the students. In order to determine what could make the playing field more fair, I needed to be "in the game" with students as well as teachers.

Outcomes of Partnership

My achieving a shared sense of ownership in my study allowed for organic growth of ideas and adjustments. One approach to my study could have been to provide the school with the tools to administer the assessments and the lessons. Teachers could have then been surveyed to determine their perceptions, changes in referrals, etc. Instead, by stepping onto the playing field with the teachers, I was able to achieve a first-hand perspective of their lived experiences. Similarly, the teachers and students became partners in the work rather than simply participants.

My being at the school for significant amounts of time allowed for informal conversations about the assessments, the TOPS observation tool, and the STEM-based lessons. As teachers began to ask if there were more examples of the lessons that they could use in their daily practice, I felt true partnership had been established.

The partnership also shaped my thinking in three ways. First, I reached a better understanding that action research for transformation hinges on being immersed in the change. To understand the lived experience of those in a school, I have to be with the administrators, teachers, and students, who will ultimately carry out the work. Second, I was prompted to remember that progress comes as a result of understanding and the adjustment of plans. By listening to the teachers, I was reminded that collective wisdom leads to better ideas and increased buy-in. Sharing ideas requires viewing the situation from multiple perspectives and my being willing to adjust my plans so they became our plans. Finally, for meaningful change to take root, relationships must exist. Creating a level playing field for students to be nominated and identified for gifted services will take more than one event—even though an extended event. The partnership with teachers will be a critical lever in this process.

Talent Development and Teacher Recommendations

As the data from my study revealed, implementing U-STARS~PLUS and STEM-based learning experiences did not result in teachers identifying a more diverse population of gifted students. Had the data revealed that a talent development resource had such positive results, we could have made the argument that additional testing would not be necessary for identifying students as academically gifted. Teachers utilized the TOPS protocol to capture the names of students they saw exhibiting gifted characteristics.

One special case which deserves highlighting is that of the single Grade 3 student of American Indian descent. This student, based on test scores alone, would not have caused a teacher or specialist to consider a referral (NNAT3 35%tile; CogAT7-NV 55%tile). However, as a result of the lesson and the teacher's use of the TOPS protocol, this student was referred for gifted services. Thus, it may be that for some students who may otherwise be overlooked, the TOPS protocol sheds light on their giftedness.

As I mentioned above, teachers provided the names of students that they viewed as gifted and were encouraged to use the TOPS protocol to guide their thinking. To gain further insight as to which characteristics were of the most value to teachers, I administered a survey via Qualtrics prior to and following my study. As the data shared previously in Table 7 revealed, the characteristics identified did not show significant changes. Worthy of note though is that Grade 4 teachers seemed to identify more of the same students prior to and after my study. This may be due to their knowing the students longer or having more experience with gifted students.

Teachers seemed to hold on to their previously held beliefs regarding observable traits which reveal giftedness. This is not surprising and may be more a function of the length of my study than a failure on the part of teachers to adopt the more comprehensive set of traits shared in the TOPS protocol. Teachers expressed interest in having increased access to activities like those found in U-STARS~PLUS as they could see behaviors in their students that they did not see during normal classroom tasks. My belief, based on this experience, is that as teachers learn more about gifted characteristics and how to see these traits in more students, they begin looking for them more intentionally. As a result, with this increased awareness and their access to appropriately challenging instructional resources to use in class, students stand out to their teachers. Giving students the opportunity to make their thinking and learning visible through

STEM-based learning paired with teachers who are more aware of what to look for should result in more equitable gifted referrals. However, this will take more time than my study allowed for this change in thinking to develop.

Universal Sweep Screening Utilizing Nonverbal Assessments

My having both teacher recommendations and test scores on two nonverbal assessments confronted me with a question of alignment. Are the students who are recommended by teachers for gifted identification also the same students who score the highest on nonverbal assessments? If teachers' perceptions aligned closely with assessment results, that would suggest that assessments could be an unnecessary burden. However, as logistical regression indicated (see Figure 16 and Figure 17), teacher recommendations did not align well with student test scores on either nonverbal assessment for either Grade 3 or Grade 4. On the NNAT3, seven students in Grade 3 scored as well or better than the two top-scoring students who were referred. Similarly, six students in Grade 3 scored as well or better than the two top-scoring Grade 3 students on the CogAT7-NV. In Grade 4, the alignment was stronger, but test results were still a poor predictor of teachers' recommendations.

As would be expected, there was a strong correlation between the NNAT3 and the CogAT7-NV based on calculated Pearson r-values. This would suggest that the use of both instruments is not necessary. However, Figure 18 does reveal that some students may perform much better on one instrument than another. Given time and financial resources, it is likely most feasible for a school or district to choose one instrument, however, it is also worthy to note that some students may be overlooked based regardless of which assessment is administered.

Variation Across Nonverbal Assessments

One of the reasons I choose to use two different nonverbal assessments was to determine if one was more sensitive to identifying students from certain demographic backgrounds. Having established that this was not the case, I examined the data further to look at students who grew the most pre- to post-assessment. If one of the instruments showed higher growth for a subset of students, that might also be a reason to choose that tool for future use. Examining Grade 3 students who had a change in score of 10 or more points failed to reveal any notable characteristics (see Figure 26). One point of interest was in Teacher Hotel's class (a pseudonym). In that classroom, five students demonstrated some of the greatest changes in scores and were identified after the study. No additional students in Grade 4 were identified using the criterion of greatest changes in scores. This may have occurred by chance but may also indicate that something different was happening in Teacher Hotel's classroom which resulted in more students being seen as academically gifted.

The use of a pre- to post-assessment criterion revealed that there was a general negative growth trend for students, but not for all students. This could be the result of test-fatigue. It could also be an indication that the duration of my study was not sufficient to see increases in scores. In general, students who had lower raw scores on the NNAT3 pre-test showed greater gains. This may indicate that some students, especially those at lower scores initially, became more confident with the assessment or were more impacted by the instructional intervention. The same trend was not as consistent for the CogAT7-NV.

This led me to examine the performance of students with the greatest changes in scores to see if those who grew the most on the NNAT3 showed similar growth on the CogAT7-NV and vice versa. The 11 Grade 3 students exhibiting the highest growth on the NNAT3 did not show

similar high growth on the CogAT7-NV. As show in Figure 30, the most frequent growth score for these students was zero. Only three of the Grade 3 students exhibited five or more points of growth on the CogAT7-NV. However, the Grade 3 students who grew the most on the CogAT7-NV also exhibited more growth on the NNAT3. This may indicate that Grade 3 students who show growth on the CogAT7-NV are likely to also show growth on the NNAT3.

I found a similar result for Grade 4 students with one additional difference worthy of discussion. Hispanic students (see Figure 33) made up the majority of students showing the greatest growth on both the NNAT3 and the CogAT7-NV exams. While only 28% of Grade 4 students identify as Hispanic, nearly half of those showing the most growth were members of this demographic group. This may indicate that the STEM-based instructional intervention was more impactful with this group or that the pre- post-assessment helped Hispanic students more than Black or White students in Grade 4.

Recommendations for Future Practice

A primary goal of my action research for transformation was to generate recommendations for Friendship Elementary and across ECCS. My work was focused on initiating change that could result in lasting modifications in an endeavor to create a more level playing field with more equitable opportunities for gifted students. I have condensed my findings into five recommendations for future practice. Some or all of these have the potential to be included in the ECCS gifted services strategic plan or to be implemented at schools on a trial basis for further consideration.

Top 10% in Demographic Groups

Plucker and Peters (2017) distilled the conversation around proportional representation down to the idea that every group has a top 10%. State guidance around gifted identification

similarly defined giftedness in terms of comparison with peers from similar backgrounds (North Carolina Academically or Intellectually Gifted Students, 1996/2018). The data from my study revealed that none of the tools I used unearthed a diverse group of students when using any one cut score or threshold. However, each tool provided insight into students who would be at the top 10% of various groups. Within my research, I focused on the demographic groups of Black, Hispanic, and White. My recommendation would be that ECCS identify the 10% of students from each demographic group while maintaining current identification practices. In this way, no student who is currently being served would be left out, but those who have been overlooked could receive services.

Expansion of Talent Development to Include Students in Earlier Grades

Talent development involves the intentional planning of learning experiences to allow students to have increased opportunities-to-learn while also making their thinking and learning visible. In my action research for transformation, I utilized U-STARS~PLUS along with other STEM-based learning experiences. The implementation timeline of my study did not allow for long-term talent development, but the comments of teacher participants led me to see that they were open to using more instructional resources such as these.

To see the potential in students, that potential must be allowed to grow. This requires a variety of learning experiences some of which happen through the daily instruction provided through the standard course of study. Talent development, and the accompanying talent spotting, requires additional experiences. It is my recommendation that ECCS consider allocating resources, human and material, toward formal talent development. Further, long-term talent development will require that this initiative begins in earlier grades.

Professional Learning: Talent Spotting Through Peer Coaching

The TOPS protocol which is part of the U-STARS~PLUS materials allowed teachers to have a comprehensive, yet manageable, list of characteristics which may indicate giftedness in students. While teacher referrals were shown to fluctuate in my study and have clearly led to disproportionate representation in ECCS, teachers will always be those who spend the most academic time with students. Therefore, assisting teachers to spot talent in students, especially those who may have had fewer opportunities-to-learn, is likely to yield lasting results. This will require resources such as U-STARS~PLUS, professional learning focused on talent spotting, and peer coaching. I suggest that peer coaching is the most effective way to continue growing teachers while also embedding gifted specialists and administrators in the transformative work.

Adapting U-STARS~PLUS Instructional Resources

Providing teachers and gifted specialists with an established framework and resources such as U-STARS~PLUS will allow their focus to be on implementation and talent spotting. U-STARS~PLUS offers resources for elementary grades across various science topics. Each topic also connects to a fiction or non-fiction text. Additionally, there are take home activities for students to use with family members. One challenge the teachers at Friendship Elementary and I encountered was aligning the lessons with state science standards and students' interest. Alignment with the state science standards was an important time consideration and students' interest was key in talent development.

Consequently, the teachers and I decided to use a mix of lessons from U-STARS~PLUS and other STEM-based learning resources. My recommendation for ECCS or others considering a STEM-based approach to talent development is to update and adapt U-STARS~PLUS, locate a different resource, or create a shared instructional resource to be used across schools.

Universal Screening Alongside Talent Development

Neither the use of a nonverbal assessment nor the implementation of a talent development resource alone resulted in a more representative group of gifted students. However, the administration of the nonverbal assessments (universal screener) to all Grade 3 and Grade 4 students at Friendship Elementary did create a roster of students in the top 10% within demographic groups. The use of the TOPS protocol while implementing STEM-based talent development lessons further refined and highlighted student strengths.

One problematic factor across ECCS is the lack of a universal screening instrument. My recommendation would be that ECCS administer CogAT as a district wide aptitude screener. While this would require an additional investment of time and treasure, the data from a universal screener of aptitude would have the potential to benefit many students. The district would then have data to inform the development of local norms both district-wide and within individual schools. District-wide data would enable the establishment of more equitable identification practices for gifted services. In addition, these data would provide other groups of students—such as exceptional children—with aptitude scores which may help the district provide them with earlier access to specialized services. The use of a universal screener combined with STEM-based talent development will allow multiple opportunities for students to demonstrate their ability and for teachers to spot these abilities.

Immediate Actions Resulting from My Study

ECCS district leadership requested and received a briefing regarding the findings and proposed actions as a result of my action research for transformation. Following the sharing of data from my study ECCS initiated several actions. First, discussions were held among senior level district leadership regarding underrepresentation and the opportunity for universal sweep

screening. The district is examining the allocation of funding to conduct a universal screen at Grade 3. Further, there is greater discussion about the need for talent development at the elementary grades.

Identifying or serving the top 10% of demographic groups is also being proposed in the 2022-2025 ECCS gifted services strategic plan. As a result of the data and conversations surrounding my study, district staff have worked to provide revised identification criteria. Within these criteria is a new designation for students from the 10% in reading and mathematics to receive the same services as currently identified students. Over the next three years, these students will be served and their experiences examined to determine the appropriate levels of support. Further, the gifted services team will study if formal identification is appropriate and what further modifications need to be made to achieve equitable representation within gifted services.

Suggestions for Future Research

My spending time embedded within the school and partnering with teachers in this action research for transformation has led me to discern several other areas worthy of future examination and study. My overarching goal is to provide students with access to learning that will allow them to capitalize on their potential. My questions for future research include:

1. What services and supports are most effective when moving to an approach that identifies the 10% of peer groups?
2. What STEM-based talent development initiatives are most effective with students?
3. How long should a student be provided with STEM-based talent development opportunities and what behaviors would be most indicative of giftedness?
4. How should talent development be modified for Language Learner populations?

5. How should identification processes be adapted for students in dual language immersion programs?
6. How can areas such as the arts, athletics, and social sciences be utilized to spot academic talent in students?

Conclusion

This is a time when so much is being asked of school systems and especially teachers. Walking daily with the partner teachers in this study was both humbling and refreshing. I am increasingly convinced that, given the appropriate resources and knowledge, we have the people to accomplish our mission. Each teacher deserves to have mentoring and collegial support so that they can grow professionally and meet the needs of all students, including gifted students. While it may be tempting to think that the burden on schools is too heavy already, we know our students' futures are already being formed in elementary schools. For this reason, we must do this work together and surmount the associated challenges. Several supports can be put into place to make this a shared responsibility.

Strategic planning for gifted services that emphasizes equity and includes strategies to achieve proportional representation is critical. As ECCS and other districts develop their three-year plans for gifted services, it is imperative that the findings of my study and other current research are taken into consideration. By appropriately incorporating strategies and accompanying measures of effectiveness in the strategic plan, the onus of responsibility is shared between the district, the school, and the teacher. With shared responsibility comes collaborative support.

Additionally, parents and the community members are key stakeholders in the work of ensuring access to gifted services. We must educate our key stakeholders if we are to earn their

trust and establish buy-in. Educating parents to expect and even insist on proportional representation and the means to reach that goal is critical. Fundamental to growing support and expectations is the development of a shared understanding of talent development and how identifying the top 10% of each demographic group as an additional identification approach broadens access while not limiting any students who identified using under the current policy. As parents from all backgrounds become better informed, they will be better able to partner with schools and advocate for resources to meet the needs of gifted students.

Ultimately, there is no single solution to the multi-faceted challenge of proportional representation. As shown through my study, there are promising practices for deciding on gifted placements including talent development, job-embedded coaching for teachers, creative use of screening tools, innovative ways to interpret data, and consideration of each student's prior experiences. While each of these approaches is necessary, in isolation they are not sufficient to reach the goal of proportional representation. Universal sweep screening as a singular tool will miss certain students. Talent development alone relies on teacher perceptions and observations which has been shown to be unreliable. Professional learning does not always result in a change in practice. However, working in tandem, there is a great deal to be gained.

While the level playing field may be an aspirational goal for years to come, the incremental changes made along the way impact students futures for the better. This work is both necessary and time sensitive. Students deserve to have caregivers and educators who either clear the academic path or at least make the hurdles manageable. For gifted students this means providing the opportunities for advancement, the structures of support, and access to all who need it. Recognizing that not all the players even have access to the field, it is our responsibility to examine our systems, mindsets, and resources and take action. Action can result in

transformation and for gifted students who are currently overlooked, that transformation can result in enhanced lifetime trajectories.

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APPENDIX A: INSTITUTIONAL REVIEW BOARD APPROVAL

IRB Approval- Email 12/4/2020

EAST CAROLINA UNIVERSITY
University & Medical Center Institutional Review Board
4N-64 Brody Medical Sciences Building· Mail Stop 682
600 Moye Boulevard · Greenville, NC 27834
Office **252-744-2914** · Fax **252-744-2284** · **rede.ecu.edu/umcirb/**

Notification of Initial Approval: Expedited

From: Social/Behavioral IRB
To: Michael Elder
CC: Robert Reardon
Date: 12/4/2020
Re: UMCIRB 20-002677
Leveling the Playing Field

I am pleased to inform you that your Expedited Application was approved. Approval of the study and any consent form(s) occurred on 12/4/2020. The research study is eligible for review under expedited category # 7. The Chairperson (or designee) deemed this study no more than minimal risk.

As the Principal Investigator you are explicitly responsible for the conduct of all aspects of this study and must adhere to all reporting requirements for the study. Your responsibilities include but are not limited to:

1. Ensuring changes to the approved research (including the UMCIRB approved consent document) are initiated only after UMCIRB review and approval except when necessary to eliminate an apparent immediate hazard to the participant. All changes (e.g. a change in procedure, number of participants, personnel, study locations, new recruitment materials, study instruments, etc.) must be prospectively reviewed and approved by the UMCIRB before they are implemented;
2. Where informed consent has not been waived by the UMCIRB, ensuring that only valid versions of the UMCIRB approved, date-stamped informed consent document(s) are used for obtaining informed consent (consent documents with the IRB approval date stamp are found under the Documents tab in the ePIRATE study workspace);
3. Promptly reporting to the UMCIRB all unanticipated problems involving risks to participants and others;
4. Submission of a final report application to the UMICRB prior to the expected end date provided in the IRB application in order to document human research activity has ended and to provide a timepoint in which to base document retention; and
5. Submission of an amendment to extend the expected end date if the study is not expected to be completed by that date. The amendment should be submitted 30 days prior to the UMCIRB approved expected end date or as soon as the Investigator is aware that the study will not be completed by that date.

The approval includes the following items:

Name	Description
Elder_LevelingThePlayingField_Dissertation_Ch1-3	Study Protocol or Grant Application
Invitation to Participate Script	Recruitment Documents/Scripts
Parental Informed Consent	Consent Forms
Student Assent Invitation to Participate	Recruitment Documents/Scripts
Student Assent Script	Consent Forms
Teacher Informed Consent	Consent Forms
Teachers Survey	Surveys and Questionnaires

For research studies where a waiver or alteration of HIPAA Authorization has been approved, the IRB states that each of the waiver criteria in 45 CFR 164.512(i)(1)(i)(A) and (2)(i) through (v) have been met. Additionally, the elements of PHI to be collected as described in items 1 and 2 of the Application for Waiver of Authorization have been determined to be the minimal necessary for the specified research.

The Chairperson (or designee) does not have a potential for conflict of interest on this study.

IRB00000705 East Carolina U IRB #1 (Biomedical) IORG0000418
IRB00003781 East Carolina U IRB #2 (Behavioral/SS) IORG0000418

___

Study.PI Name:
Study.Co-Investigators:

APPENDIX B: TEACHER INFORMED CONSENT

Informed Consent to Participate in Research

Information to consider before taking part in research that has no more than minimal risk.

Title of Research Study: Leveling the Playing Field: Achieving Proportional Gifted Representation Through Opportunities to Learn and Nonverbal Assessments

Principal Investigator: Michael J. Elder (Person in Charge of this Study)
Institution, Department or Division: Educational Leadership
Address: 702 Kathryn Avenue Jacksonville, NC 28540
Telephone #: 910-330-5933
Study Coordinator: Dr. R. Martin Reardon
Telephone #: 252-328-6862

Researchers at East Carolina University (ECU) study issues related to society, health problems, environmental problems, behavior problems and the human condition. To do this, we need the help of volunteers who are willing to take part in research.

The purpose of this focus of practice is to create a framework for equitable identification of giftedness in elementary schools. Working in collaboration with gifted specialists, school administrators, teachers, and students, I will implement an intervention based on an iterative refinement cycle. By implementing a screening instrument along with academic talent development opportunities, my intervention will develop scalable procedures for opening access to a more diverse population of gifted students.

Why am I being invited to take part in this research?
The purpose of this research is to determine how our school system can correctly identify students for gifted services. You are being invited to take part in this research because you are a teacher of third or fourth at the school where I would like to learn more about what tools we can use to find and identify all gifted students. The decision to take part in this research is yours to make. By doing this research, we hope to learn how we can correctly identify gifted students at your school.

If you volunteer to take part in this research, you will be one of about 8 people to do so.

Are there reasons I should not take part in this research?
There are no known risks to participating in this study. All work will be done within the normal school day and will be tied to classroom instruction.

What other choices do I have if I do not take part in this research?
You can choose not to participate. If you choose to not participate, there are no negative impacts.

Where is the research going to take place and how long will it last?
The research will be conducted at your elementary school. You will be provided with all instructional materials and any professional learning that you may need. This research will last through the end of the 2020-2021 school year.

What will I be asked to do?
You will be asked to do the following: During this study I will work alongside you to explore which students are currently identified as gifted and the characteristics you look for in deciding to refer a child for gifted identification.

During December we will work together to complete a survey which should only take about 10 minutes and to learn about the U-STARS~PLUS (Using Science, Talents, and Abilities to Recognize Students ~ Promoting Learning for Under-Represented Students) framework.

In January, we will work together to administer two nonverbal assessments of ability to your third and fourth grade students. These assessments will each take approximately 30 minutes. January will also give us time to plan out and prepare to implement three U-STARS~PLUS units. Each unit will be a chance to learn more about the potential of students and how they interact with science content and some short stories. During this time we will use the Teacher Observation of Potential in Students (TOPS) form. During this time, I will also provide you with pattern recognition tasks for students to complete each week. These will be able to do be completed during transition times such as the start of the day or between classes.

In May, we will ask you to share with us some survey data again which should take about 10 minutes. We will also ask your students to participate in the nonverbal assessments one more time.

No data collected will be connected to you or your name. Your confidentiality in this study will be maintained at all times.

What might I experience if I take part in the research?
We don't know of any risks (or chance of harm) associated with this research. Any risks that may occur with this research are no more than what you would experience in everyday life. We don't know if you will personally benefit from taking part in this study. There may not be any personal benefit to you but the information gained by doing this research may help others in the future.

Will I be paid for taking part in this research?
We will not be able to pay you for the time you volunteer while being in this study.

Will it cost me to take part in this research?
It will not cost you any money to be part of the research

Who will know that I took part in this research and learn personal information about me?
ECU and the people and organizations listed below may know that you took part in this research and may see information about you that is normally kept private. With your permission, these people may use your private information to do this research:

- The University & Medical Center Institutional Review Board (UMCIRB) and its staff have responsibility for overseeing your welfare during this research and may need to see research records that identify you.

How will you keep the information you collect about me secure? How long will you keep it?
Any information I collect from you or about you will be kept strictly confidential. Your name will be removed from any surveys or data and replaced with a confidential code. All digital files will be password protected and any paper files will be stored securely away from the school site. Files will be stored for three years, but no identifiable information will be kept. Your confidentiality will be protected.

What if I decide I don't want to continue in this research?
You can stop at any time after it has already started. There will be no consequences if you stop and you will not be criticized. You will not lose any benefits that you normally receive.

What if I decide I don't want to continue in this research?
You can stop at any time after it has already started. There will be no consequences if you stop and you will not be criticized. You will not lose any benefits that you normally receive.

Who should I contact if I have questions?
The people conducting this study will be able to answer any questions concerning this research, now or in the future. You may contact the Principal Investigator at (910) 330-5933(Monday-Friday, between 8:00am and 5:00pm.

If you have questions about your rights as someone taking part in research, you may call the University & Medical Center Institutional Review Board (UMCIRB) at phone number 252-744-2914 (days, 8:00 am-5:00 pm). If you would like to report a complaint or concern about this research study, you may call the Director for Human Research Protections, at 252-744-2914.

I have decided I want to take part in this research. What should I do now?
The person obtaining informed consent will ask you to read the following and if you agree, you should sign this form:

- I have read (or had read to me) all of the above information.
- I have had an opportunity to ask questions about things in this research I did not understand and have received satisfactory answers.
- I know that I can stop taking part in this study at any time.
- By signing this informed consent form, I am not giving up any of my rights.
- I have been given a copy of this consent document, and it is mine to keep.

_____ _____

Participant's Name (PRINT) **Signature** **Date**

Person Obtaining Informed Consent: I have conducted the initial informed consent process. I have orally reviewed the contents of the consent document with the person who has signed above, and answered all of the person's questions about the research.

_____

Person Obtaining Consent (PRINT) **Signature** **Date**

APPENDIX C: PARENTAL INFORMED CONSENT

Parental or Legally Authorized Representative Permission to Allow Your Child to Take Part in Research

Information to consider before allowing your child to take part in research that has no more than minimal risk.

Title of Research Study: LEVELING THE PLAYING FIELD: ACHIEVING PROPORTIONAL GIFTED REPRESENTATION THROUGH OPPORTUNITIES TO LEARN AND NONVERBAL ASESSMENTS

Principal Investigator: Mr. Michael J. Elder (Person in Charge of this Study)
Institution, Department or Division: East Carolina University and Onslow County Schools Gifted Services
Address: 200 Broadhurst Road Jacksonville, NC 28540
Telephone #: (910) 455-2211 extension 20264
Study Coordinator: Dr. R. Martin Reardon
Telephone #: (252) 328-6862

Researchers at East Carolina University (ECU) and Onslow County Schools study issues related to society, health problems, environmental problems, behavior problems and the human condition. To do this, we need the help of volunteers who are willing to take part in research.

Why is my child being invited to take part in this research?
The purpose of this research is to determine the best way to identify students for gifted services. Your child is being invited to take part in this research because your school is much like many other schools in Onslow County. The decision for your child to take part in this research will also depend upon whether your child wants to participate. By doing this research, we hope to learn better ways to work with all kids and to identify students who many benefit from additional services.

If you and your child agree for him/her to volunteer for this research, your child will be one of about 100 people to do so.

Are there reasons my child should not take part in this research?
I understand that I should not agree for my child to take part in this study if he/she is uncomfortable.

What other choices do I have if my child does not take part in this research?
Your child can choose not to participate.

Where is the research going to take place and how long will it last?
The research will be conducted at Hunters Creek Elementary School. You will not need to come to the school during the study. The total amount of time your child will be asked to volunteer for this study is four hours (all during the school day) between January and May 2021.

What will my child be asked to do?
Your child will be asked to do the following: In January 2021, your child and his class will be asked to take one section of the Cognitive Abilities Test. This should take about 30 minutes. Your child will also be asked to complete one additional assessment, the Naglieri Nonverbal Ability Test which will also take 30 minutes. In May, your child and the class will take these same assessments. In between January and May, I will work with your child's teacher to implement three science experiences.

What might I experience if I take part in the research?
We don't know of any risks (the chance of harm) associated with this research. Any risks that may occur with this research are no more than what you would experience in everyday life. We don't know if your child will benefit from taking part in this study. There may not be any personal benefit to your child but the information gained by doing this research may help others in the future.

Will my child be paid for taking part in this research?
We will not be able to pay you or your child for the time you volunteer while being in this study.

Will it cost me anything for my child to take part in this research?
It will not cost you any money to be part of the research.

Who will know that I took part in this research and learn personal information about me?
ECU and the people and organizations listed below may know that your child took part in this research and may see information about your child that is normally kept private. With your permission, these people may use your child's private information to do this research:

- The University & Medical Center Institutional Review Board (UMCIRB) and its staff have responsibility for overseeing your child's welfare during this research and may need to see research records that identify your child.

How will you keep the information you collect about my child secure? How long will you keep it?
All data will be kept secure on a private electronic storage drive hosted by East Carolina University. Your child's name will be kept confidential and his/her name will be removed from testing results and any work samples.

What if my child decides he/she doesn't want to continue in this research?
Your child can stop at any time after it has already started. There will be no consequences if he/she stops and he/she will not be criticized. Your child will not lose any benefits that he/she would normally receive.

Who should I contact if I have questions?
The people conducting this study will be able to answer any questions concerning this research, now or in the future. You may contact the Principal Investigator, Mr. Michael Elder, at (910) 455-2211 extension 20264 (Monday-Friday, between 8:00 AM and 5:00 PM).

If you have questions about your child's rights as someone taking part in research, you may call the University and Medical Center Institutional Review Board (UMCIRB) at phone number 252-744-2914 (days, 8:00 am-5:00 pm). If you would like to report a complaint or concern about this research study, you may call the Director of Human Research Protections, at 252-744-2914

I have decided my child can take part in this research. What should I do now?
The person obtaining informed consent will ask you to read the following and if you agree, you should sign this form:

- I have read (or had read to me) all of the above information.
- I have had an opportunity to ask questions about things in this research I did not understand and have received satisfactory answers.
- I know that my child can stop taking part in this study at any time.
- By signing this informed consent form, my child is not giving up any of his/her rights.
- I have been given a copy of this consent document, and it is mine to keep.

_____ _____

Parent's Name (PRINT) **Signature** **Date**

Person Obtaining Informed Consent: I have conducted the initial informed consent process. I have orally reviewed the contents of the consent document with the person who has signed above, and answered all of the person's questions about the research.

_____

Person Obtaining Consent (PRINT) **Signature** **Date**

APPENDIX D: STUDENT ASSENT SCRIPT

Script for Student Assent to Participate

Title of Research Study: LEVELING THE PLAYING FIELD: ACHIEVING PROPORTIONAL GIFTED REPRESENTATION THROUGH OPPORTUNITIES TO LEARN AND NONVERBAL ASESSMENTS

Principal Investigator: Mr. Michael J. Elder (Person in Charge of this Study)
Institution, Department or Division: East Carolina University and Onslow County Schools Gifted Services
Address: 200 Broadhurst Road Jacksonville, NC 28540
Telephone #: (910) 455-2211 extension 20264
Study Coordinator: Dr. R. Martin Reardon
Telephone #: (252) 328-6862

Script for speaking with third and fourth grade student participants:

Good morning/afternoon,

My name is Mr. Elder and I want to start by saying thank you for letting me tell you a little about a project that I am doing for my college work with East Carolina University. How many of you know ECU?

I am in school much like you are and I am working on a project. Who of you has worked on a project this year for your school?

My project is going to let me work with some of you if you are willing. I am also going to get to work with your teachers. What I am trying to learn is how to best see where each of you is smart and how intelligent you are. I already know that you know a lot because you are in third/fourth grade and your teachers and your parents have taught you many things. You have also learned a lot because of the books you've read, the shows you've watched, and the friends you have.

With what we do together, there will not be any grades and there is no homework. I just want to learn as much as I can from you. So, how will I learn from you? Sometimes, it will be by working with your teacher to plan science lessons; sometimes it will be by coming in and watching you during these science lessons; sometimes, I will look at the work you've done in class, and two times, I will be asking you to look at some patterns and telling me what comes next in the pattern.

I would like to ask you to do this work with me, but I also want you to know that you do not have to do this work. If you decide you would rather not do this science and pattern work, we will be glad to find you something different.

I would love to hear your questions and I am glad to answer all that I can.

APPENDIX E: SURVEY OF TEACHER PERCEPTIONS OF GIFTED STUDENT CHARACTERISTICS AND PERCEIVED GIFTED STUDENTS

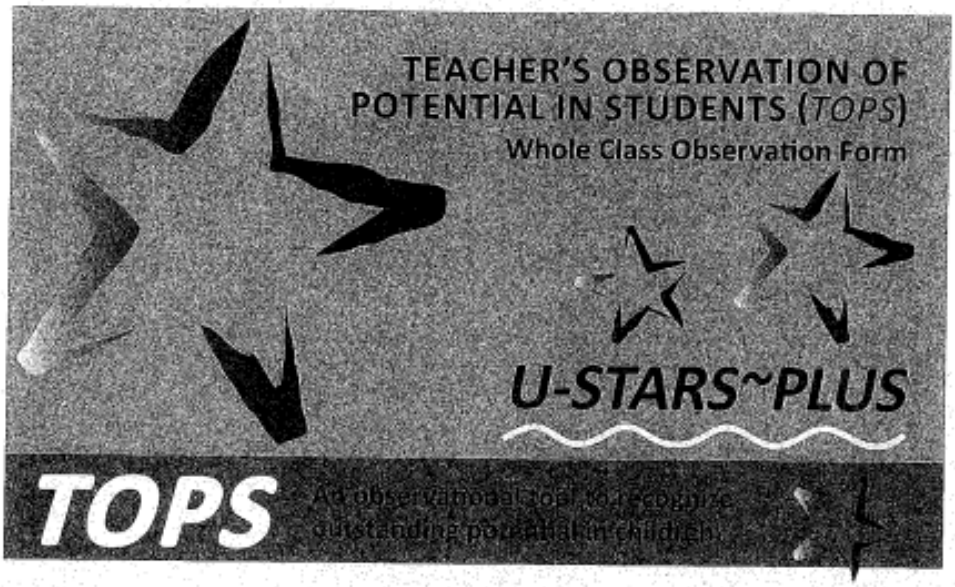
No personally identifiable information will ever be shared. Your name will be removed from any data and your identity, thoughts, and information will remain confidential during and after this action research project. If, at any time, you feel uncomfortable participating, you may skip a question or remove yourself from this study. Please contact Michael Elder (melder130@yahoo.com or 910-330-5933) if you have any questions or concerns. Thank you for your partnership in this project.

1. Please enter your name
2. What grade do you currently teach?
3. How many students are you the teacher-of-record for?
4. What characteristics, attitudes, behaviors, mindsets, etc. do you look for when you consider referring a student for gifted identification?
    a. Are there any of these characteristics, attitudes, behaviors, mindsets that you believe are more important than others when thinking about referring a student for gifted identification?
5. Thinking of the students you are current the teacher-of-record for, please share the names (first name and last initial) of each student you currently believe should be referred for gifted identification.
6. Please share any additional thoughts you have related to referral, identification, and/or services for gifted students.

Thank you for your participation in this survey. Your input will remain confidential and will help shape this action research project. If you have any questions or would like to discuss this survey further, please contact Michael Elder (melder130@yahoo.com or 910-330-5933).

APPENDIX F: U-STARS~PLUS OBSERVATION INSTRUMENT

The TOPS (Teacher's Observation of Potential in Students) form was utilized by teachers throughout my study. The TOPS form is copyright protected and shared here with permission of Dr. Mary Ruth Coleman



Purpose

The *Teacher's Observation of Potential in Students (TOPS)* is a tool to help you recognize children (ages 4-10) with outstanding potential who may be gifted. The *TOPS* is designed to be the teacher observation component of a comprehensive approach to recognizing students with outstanding potential. This tool should complement other sources of information. The *TOPS* is organized around nine domains: (1) **Learns Easily**, (2) **Shows Advanced Skills**, (3) **Displays Curiosity & Creativity**, (4) **Has Strong Interests**, (5) **Shows Advanced Reasoning & Problem Solving**, (6) **Displays Spatial Abilities**, (7) **Shows Motivation**, (8) **Shows Social Perceptiveness**, and (9) **Displays Leadership**. Examples of behaviors that can be used as indicators of potential are given for each domain. These behaviors capture both "teacher pleasing" and "non-teacher pleasing" behaviors because bright children are not always "teacher-pleasers". Non-teacher pleasing behaviors can sometimes impede our recognition of students' potential. As you use this tool, please remember to observe all of your students, including those from educationally vulnerable populations (culturally/linguistically diverse, economically disadvantaged and students with disabilities) who are often underrepresented in gifted services.

Directions

1. Select a 3 to 6 week period during which to observe your class.
2. The first time a child shows behaviors within a given domain, write the child's name inside the *TOPS* folder, in the box for that domain.
3. Each additional time you observe that child's behavior within a noted domain, add a tally mark beside his or her name.
4. After the observation period is complete, record your observations on the Whole Class *TOPS* Profile. For each child, indicate which domains were noted and why, either due to the *intensity* or the *frequency* of behaviors seen in that domain.

Next Steps

After completing the form, it's time to decide which children to more closely observe, using the *TOPS* Individual Student Observation Form:

? Does the intensity of the behavior(s) in any one domain or situation warrant a closer look?
? Does the frequency of the behavior(s) within any one domain or across multiple domains warrant a closer look?
? Do you need more information to help you better understand and plan for the child?

If you answer "yes" to any of these questions, you may want to complete an Individual *TOPS* for this student.

Authors: Mary Ruth Coleman
Sneha Shah-Coltrane
Ann Harrison

previously known as the "Harrison Observation Student Form"

LEARNS EASILY
Is eager to learn.
Has lots of information.
Retains and retrieves information easily.
Carries out complex instructions with ease.
Completes assignments ahead of others (gets A's without effort).
Shows strong memory, quick recall.
Uses complex language, math, and/or musical symbol systems.
Prefers work with more complexity.
Refuses and becomes impatient with tedious and repetitious work.
Appears bored with or rushes through "easy" work.
Corrects the teacher and students in class.
Does not show work, only answers.

SHOWS ADVANCED SKILLS
Reads and comprehends on an advanced level (this may be seen in listening comprehension).
Tells or reproduces stories and events with detail.
Has a large vocabulary.
Speaks more than one language.
Uses descriptive language, similies, puns.
Makes up songs, stories, and rhymes.
Spends free time absorbed in books (may read when supposed to do other things).
Seeks non-fiction as well as fiction.
Generates many writing ideas and products.
Understands advanced mathematical concepts.
Understands the meaning and use of maps, diagrams, and graphs.
Connects and uses mathematical language and skills in meaningful real-world ways.
Communicates well with symbols (art, design, music, or dance).
Carries on conversations related to academic topics and within a discipline.
Masters and shows high level thinking in a specific content area.
Manipulates situations for specific purposes.
Challenges teacher to go further in depth and complexity.

DISPLAYS CURIOSITY & CREATIVITY
Questions, explores, experiments.
Asks unusual, provocative questions.
Is curious. Asks how, why, and what if?
Tries to discover the how and why of things.
Enjoys doing things in new ways.
Puts unrelated ideas and materials together in new and different ways.
Offers unique responses.
Has an active imagination (likes to pretend).
Assumes another persona during activities or conversations.
Has trouble distinguishing fact from fiction.
Does not follow or wait for directions (makes own rules).
Refuses to follow rules unless they see "why."
Is seen as "deviant" or non-comformist.
Develops and tells elaborate "stories."

HAS STRONG INTERESTS
Is able to lose self in something of interest.
Demonstrates unusual or advanced interests.
Keeps extensive collections.
Is considered an "expert" in a particular topic (may seem domineering).
Checks out books, websites, and materials on particular topics.
Chooses to become involved when area of interest is addressed.
Has interest in areas outside typical school curriculum.
Leads discussions back to one topic of interest.
Resists transitions and moving onto new topics of study.

SHOWS ADVANCED REASONING & PROBLEM SOLVING

Is a keen observer (spots details others miss).
Recognizes and can recreate patterns (may be in numeric, linguistic, musical, or physical form).
Draws accurate and advanced conclusions based on information.
Designs experiments to test hypotheses (develops logical ways to collect and analyze data).
Makes mental connections (transfers learning into other subjects or real life situations).
Sees cause and effect relationships. Asks "why?"
Expresses relationships between past and present.
Is aware of problems others do not see.
Devises or adapts strategies to solve problems.
Questions "rote" approaches to problem solving.
Has "out of the box" ways of solving problems and seeing situations.
Doesn't do well on tests with limited answer choices.
Is argumentative.

DISPLAYS SPATIAL ABILITIES

Has a good sense of direction.
Figures out why and how things work.
Takes objects apart and reassembles with speed and accuracy.
Creates interesting shapes and patterns.
Shows unusual talent in various art forms (including musical, dance, and performance arts).
Invents games.
Creates three-dimensional structures.
Has excellent motor planning and coordination.
Needs movement to connect learning to memory.
Prefers hands-on experiences to learn (uses manipulatives/artifacts).
Brings gadgets, toys, etc. to tinker with at school.
Moves around often (keeps hands and body always busy).

SHOWS MOTIVATION

Is a self-starter (requires little direction).
Is persistent in pursuing and completing self-selected tasks.
Is independent (requires little feedback).
Prefers to do things on own ("the quiet child").
Enjoys challenge of new and different.
Prefers interacting with older people.
Converses about mature topics.
Does not follow typical path (moves to the beat of a different drummer).
Questions authority (is considered a "trouble-maker" or instigator).

SHOWS SOCIAL PERCEPTIVENESS

Displays sense of humor (may be "class clown").
Responds to needs of others (is able to see another's point of view).
Enjoys working in groups.
Identifies with individuals in books, history, movies, etc.
Uses skills to resolve conflict.
Stands up to bullying and/or protects other students who are being mistreated.
Reads social situations well and can gain acceptance in most groups.
Displays strong sense of justice (may over-react emotionally).
Is easily distracted by others' needs. Is over-talkative and social.
Uses humor and sarcasm inappropriately.

DISPLAYS LEADERSHIP

Organizes materials and activities.
Accepts and carries out responsibilities.
Supports others who may be vulnerable with advocacy and protection (may serve as translator for others).
Is sought by others (influences others, positively or negatively).
Adapts readily to new situations and changes.
Is a positive and compassionate guide to others.
Prefers adult company.
Is seen as manipulative and strong-willed.
Is seen as "bossy" (wants to be the center of attention).
Dominates others (may not be a good follower).

WHOLE CLASS *TOPS* PROFILE

Dates of Observation ____________ to ____________

Indicate the TOPS domains recognized and describe the student potential and behaviors. Check reason why recognized: F= Frequency and I= Intensity.*

Names of Students	Learns Easily		Shows Advanced Skills		Displays Curiosity and Creativity		Has Strong Interests		Shows Advanced Reasoning and Problem Solving		Displays Spatial Abilities		Shows Motivation		Shows Social Perceptiveness		Displays Leadership		Race/Ethnic Code A=Asian, AI=American Indian or Alaska Native, B=Black/African American, NH=Native Hawaiian or Other Pacific Islander, HL=Hispanic/Latino, W=White/Caucasian, O=Other. You may mark one or more.							Gender	
	F	I	F	I	F	I	F	I	F	I	F	I	F	I	F	I	F	I	A	AI	B	NH	HL	W	O	F	M

Coleman, M.R., Shah-Coltrane, S., & Harrison, A. (2010). *Teacher's observation of potential in students: Whole class form.* Arlington, VA: Council for Exceptional Children.

** Frequency:* Does the child often show strengths within this domain?
Intensity: Do you feel that the child's strength in this domain is "extreme" and/or "highly atypical"?

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APPENDIX G: INITIAL TEACHER PRESENTATION

Leveling the Playing Field: Achieving Proportional Gifted Representation Through Opportunities to Learn and Nonverbal Assessments

ECU EDUCATIONAL LEADERSHIP

Michael J. Elder
Department of Educational Leadership
College of Education
East Carolina University
January 2021

1

2

What is Our Problem of Practice?

- Historic underrepresentation of Black and Hispanic students in gifted services
- Excellence gaps (Plucker & Peters, 2017) result from Opportunity gaps
- Purpose: To create a framework for equitable identification of giftedness

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3

What would we expect?

$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1
$10	$10	$10	$10	$10	$10	$10	$10	$10	$10	$10
$100	$100	$100	$100	$100	$100	$100	$100	$100	$100	$100

	1	2	3	4	5	6	7	8	9	10
$1 Bills										
$10 Bills										
$100 Bills										

	1	2	3	4	5	6	7	8	9	10
White										
Hispanic										
Black										

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4

Partnership with Hunters Creek Elementary

Elementary School #	Total Number Identified	Total Students	Black Students: Identified	Black Students: Enrolled	Hispanic Students: Identified	Hispanic Students: Enrolled	White Students: Identified	White Students: Enrolled	Risk Ratio: Black Students	Risk Ratio: Hispanic Students	Risk Difference: Black Students	Risk Difference: Hispanic Students	Raw Differential Representation (RDR): Black Students	Raw Differential Representation (RDR): Hispanic Students
7	34	299	1	46	4	56	11	79	0.13	0.43	-0.14	-8.10	-6.67	-5.33

- Updated Numbers (2020 Fall Headcount):
  - Identified: 7 White students; 3 Black students; 2 Hispanic students (16 students across all races/ethnicities)
- Demographically diverse
- Enough students to determine effectiveness of interventions
- Both Black and Hispanic Students being overlooked
- Willing administrative team
- Geography

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What will be asked of you as a teacher?

- January and May (10-minute survey)
- Time to administer non-verbal assessments
  - January and May; Two 30-minute assessments
- One U-STARS-PLUS Lesson
  - February, March, April
  - Content to align with grade-level science standards
  - Observe students during lesson implementation using TOPS form
  - Lesson can be led by Michael Elder, AIG Specialist, Teacher, or combination
- Share pattern recognition tasks weekly

6

What is U-STARS~PLUS? & Why?

- https://sway.office.com/b4wYqp4NqzSNsEHS?ref=Link
- General Flow
  - Fiction text → Questioning → Family Take Home Science Packet (encouraged, but not required)
  - Follow Up → Science Activity → Related Fiction Text
- What do you have to prepare?
  - Should be nothing to prepare
  - Only to record what you see students doing (TOPS Form)

Potential is Often Invisible → Students Respond to Science & Literature → TOPS Form To Guide Our Observations → Flexible and Expandable

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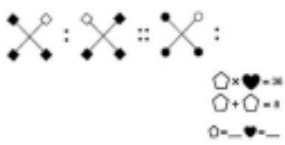
What will be asked of my students?

- Participate in non-verbal assessments
  - January and May
  - Two 30-minute assessments
- Engage with U-STARS~PLUS Science Lessons
- Engage with pattern recognition tasks



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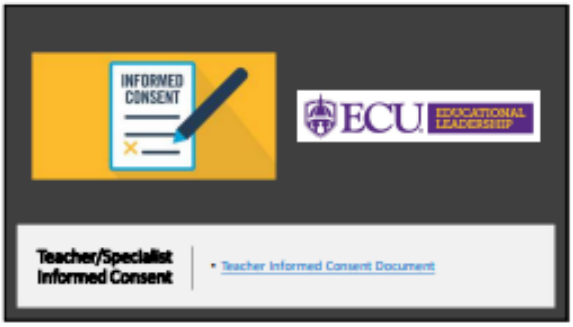

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Teacher/Specialist Informed Consent

- Teacher Informed Consent Document

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Initial Teacher Survey

- http://bit.ly/michaelelder1 or
- https://ecu.az1.qualtrics.com/jfe/form/SV_6g8cEARz35f23md
- 7 Questions (handout version as well)
  - Name; Grade; Number of Students;
  - Characteristics you look for in gifted students
  - Who are you teaching now that you think should be referred for gifted services?

10

What's next

- Your Questions
- Parental Consent
- Student Assent
- Initial Assessments
  - 30 minutes online for NNAT3
  - 30 minutes online/paper-pencil for CogAT8-NV
- Teacher Survey
- Choosing Dates/Planning for
  - Student Assessment
  - February U-STARS~PLUS lessons
  - March U-STARS~PLUS lessons
  - April U-STARS~PLUS lessons
- Receive pattern recognition tasks

UP NEXT

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Other Reference Materials

- East Carolina University IRB Approval
- Onslow County Schools IRB Approval
- Key Articles/Studies Used in Literature Review

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Overall Study Design and Timeline

13

Summary

- Given access to appropriate and engaging opportunities to learn, students from all backgrounds can express their giftedness in ways that are observable and recognizable to teachers.
- Utilizing instructional and assessment tools, a new framework for identification will allow representational access to gifted services for Black and Hispanic students in one elementary school.

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APPENDIX H: LIQUID LOGIC LESSON

The Liquid Logic Family Science Activity is copyright protected and shared here with permission of Dr. Mary Ruth Coleman.

Liquid Logic

Family Science Activity

Due Date: _____

This activity helps you learn about...

Matter: Liquids

- properties of water
- surface tension

This activity involves...

Collecting data, communicating, experimenting, formulating hypotheses, inferring, interpreting data, observing, predicting

Activity Duration

Allow 3 days to complete this activity.

What do we need?

From School: 1 dropper (pipette), 1 penny, 1 plastic fork, 1 small paper clip, 1 magnifying lens, 1 napkin, 1-gallon plastic bag, 1 Observation Record

From Home: Bowl, water

What are we doing?

Liquids have a special property that creates a skin-like surface. This property is called *surface tension*. Your scientist will conduct tests to investigate water's surface tension. She or he will see how many drops of water can fit on the top of a penny and whether a metal paper clip can successfully float on the surface of water in a bowl.

How are we going to do this?

In this activity, you will test to see how many drops of water you can fit on the top of a penny. You will also test to see if a paper clip can float on the surface of water in a bowl.

Days 1–2

1. First, clean your penny with a napkin to remove any oils or dirt. Place your penny on a flat surface that can get wet.
2. Predict how many drops of water you think can fit on the top of your penny. Write your prediction on the Observation Record.
3. Put some water in a bowl. Using the dropper, slowly and carefully add one drop of water to your penny at a time. Keep an accurate count of how many drops you add.
4. Before your penny overflows, use your magnifying lens to observe the penny from the side. Record on your Observation Record what you see.
5. Continue to add drops and keep counting! Stop when the water spills over the edge of the penny.
6. How many drops did your penny hold before spilling over? Record these results on your Observation Record and on the graph.
7. Repeat Steps 3–6 two more times and record your data on the graph section of the Observation Record.

Days 3–4

1. Fill a bowl with sink water.
2. Drop the paper clip into the water. Observe what happens to the paper clip. Record what you see on the Observation Record.
3. Now, place your paper clip flat on the top of your fork. Gently lower the fork to the surface of the water until the paper clip floats on the surface.
4. Slide the fork away from under the paper clip very slowly and carefully. You may need to try this a few times to make it work. Make sure to dry off the paper clip each time you try to make it float.
5. Use your magnifying lens to observe the paper clip and bowl from the side.
6. Describe what you see on the Observation Record.
7. Finish the Observation Record and discuss the Family Time questions below.
8. Return your Observation Record, supplies, and packet to school by the date due.

Family Time Questions

1. Why do you think the drops of water do not run off of the penny right away?
2. Do you get the same size drop each time? How can you tell?
3. Why are the results different or not different each time you add water drops?
4. Why do you think the paper clip rests on the surface without sinking?
5. Where else do you see water drops sticking together?

Family Notes

- Make sure to add the water drops slowly. Drops can come out fast if you are not careful. Start over if you lose count or get lots of water at once.
- Help your scientist keep an accurate count of the number of water drops it takes before the water runs off the penny.
- Making the paper clip float requires a steady hand. Encourage your scientist to keep trying and/or assist if needed.
- On the Observation Record, all responses are acceptable; no answer is right or wrong. For the "I discovered" section, any thoughts are welcome.
- Encourage your scientist to record what she or he observes and thinks about the activity. Words or drawings may be used to record the observations.
- Your scientist may need help to complete the activity and fill out the Observation Record. Please partner with your child on this activity.

Family Science Observation Record

Liquid Logic

Name: _____

Date: _____

Hypothesis. I predict that my penny will hold _____ drops of water.

Complete the charts below based on your observations. Use words and/or drawings.

Penny With Drops of Water	What I see....

Paper Clip Dropped in Water	What I see....

Paper Clip in Water With Fork	What I see....

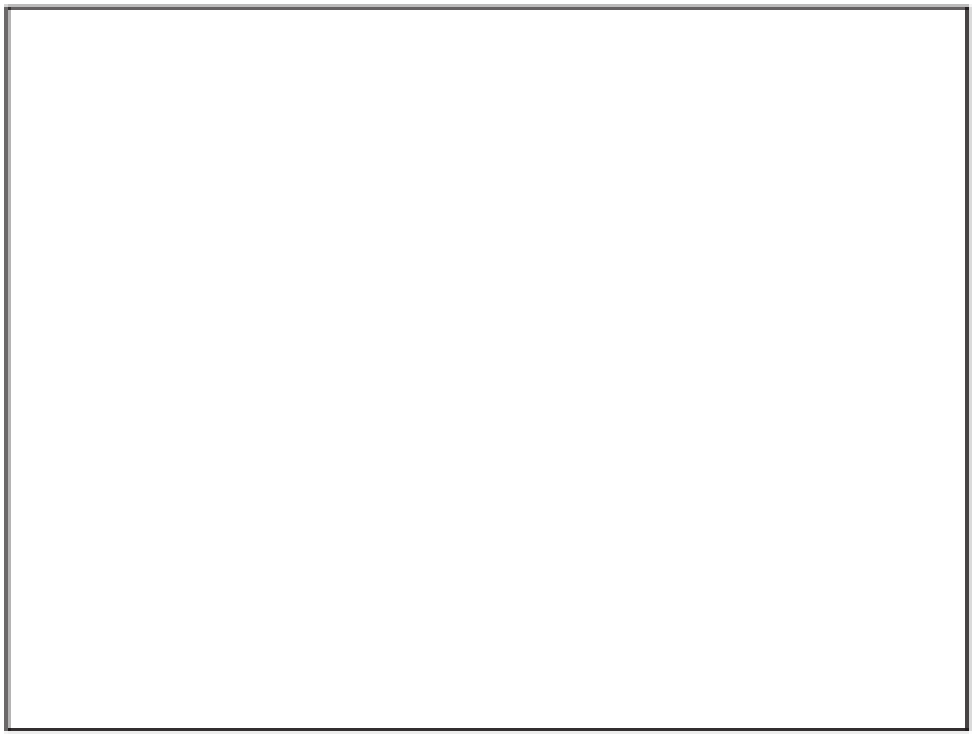
Family Science

Complete the graph below with your results of the trials.

Drops of Water on a Penny

# of Drops	1st Trial	2nd Trial	3rd Trial
17			
16			
15			
14			
13			
12			
11			
10			
9			
8			
7			
6			
5			
4			
3			
2			
1			

I discovered...



APPENDIX I: SNOWBALLS STORY CHOICE BOARD

What types of materials were used to make the snow family? What caused the family to disappear?	If you were creating a snow person, would you prefer to use natural materials (things found outdoors) or things you would buy in a store? Why? What helps you make your decision?	How did the sun affect the snow family? Why did it snow and what caused the snow family to melt? What groups could you classify the materials used to create the snow family into?
What would you design or change to keep the snow family from melting?	Instead of a snow family, what different thing could you build using the same materials used in the story? How does weather change where you live? How do changes in the weather affect what you do?	Describe the changes to the snow family from the beginning of the story to the end of the story? How did the birds react to the snow coming?
Design a Hunters Creek themed snow family. Who would the characters be? What materials would you use to create this family?	How could you design an experiment to test different ways to see water change (through freezing, thawing, evaporating, and condensation)? Would it be possible to use a liquid other than water?	Use your electronic and print resources to research the properties of water. Then use that information to create a game to help others understand how water changes.

APPENDIX J: LUNAR MOTION LESSON

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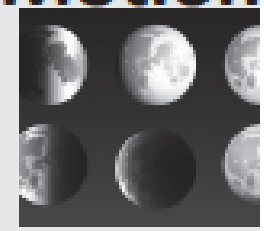
Lunar Motion



Family Science Activity

Due Date: _____

This activity helps you learn about...

Objects in the Sky: Moon

- patterns
- movement
- change

This activity involves

Collecting data, communicating, experimenting, formulating hypotheses, inferring, interpreting data, observing, predicting

Activity Duration

Allow 10–12 days to complete this activity.

What do we need?

A clear night sky where you can see the moon.

What are we doing?

The earth's moon moves in a pattern and seems to change shape over days, weeks, and months. Your scientist will make predictions about the shape and location of the moon in relation to your home. He or she will watch the moon daily for 2 weeks to see what happens.

How are we going to do this?

In this activity, you will look at the moon every day for two weeks. Start 3–4 days past the new moon on the day your teacher suggested.

It will be best to look for the moon 1–2 hours past sunset in the evening.

Day 1

1. Make a prediction about how the moon will change over the next 2 weeks. Think about its shape and location in the sky. Record your prediction on the Observation Record.
2. Pick a time in the evening and a place to look at the moon. Try to observe the moon at this same time and place each day.
3. At the time and place you decided, look up at the moon and study it carefully. What does it look like? Describe its shape. Where is it in the sky? Complete your Observation Record based on your study of the moon.

Days 2–10

1. Repeat Step 3 for the next 9 days. Try to observe the moon at the same time every day and from the same location. If you cannot see the moon on a certain day, note that on your Observation Record and think about why.
2. At the end of your lunar watch, finish the Observation Record and discuss the Family Time questions below.
3. Return your Observation Record and packet to school by the date due.

Family Time Questions

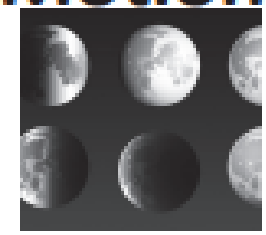
1. How did the moon change over your observation time?
2. Why do you think the moon appears to change shapes as time passes?
3. Did the Moon appear to move in the sky over time? Why or why not?
4. Did you see other objects in the sky that appear every night? Describe them. Do they move in the sky?
5. Were you able to see the moon clearly every night? Why or why not?

Family Notes

- The *new moon* is the phase of the moon when the moon cannot be seen from earth. This happens because the side of the moon that is facing us is not being lit by the sun. We begin to see the moon about 3–4 days after the new moon.
- Try to look at the moon at the same time and from the same place each day. It will be best to look at the moon 1–2 hours after sunset.
- On the Observation Record, all responses are acceptable; no answer is right or wrong. For the "I discovered" section, any thoughts are welcome.
- Encourage your scientist to record what she or he observes and thinks about the activity. Words or drawings may be used to record the observations.
- Your scientist may need help to complete the activity and fill out the Observation Record. Please partner with your child on this activity.

Family Science Observation Record

Lunar Motion



Name: _____

Date: _____

Hypothesis: Over the next two weeks, I predict that the moon's shape will

_____

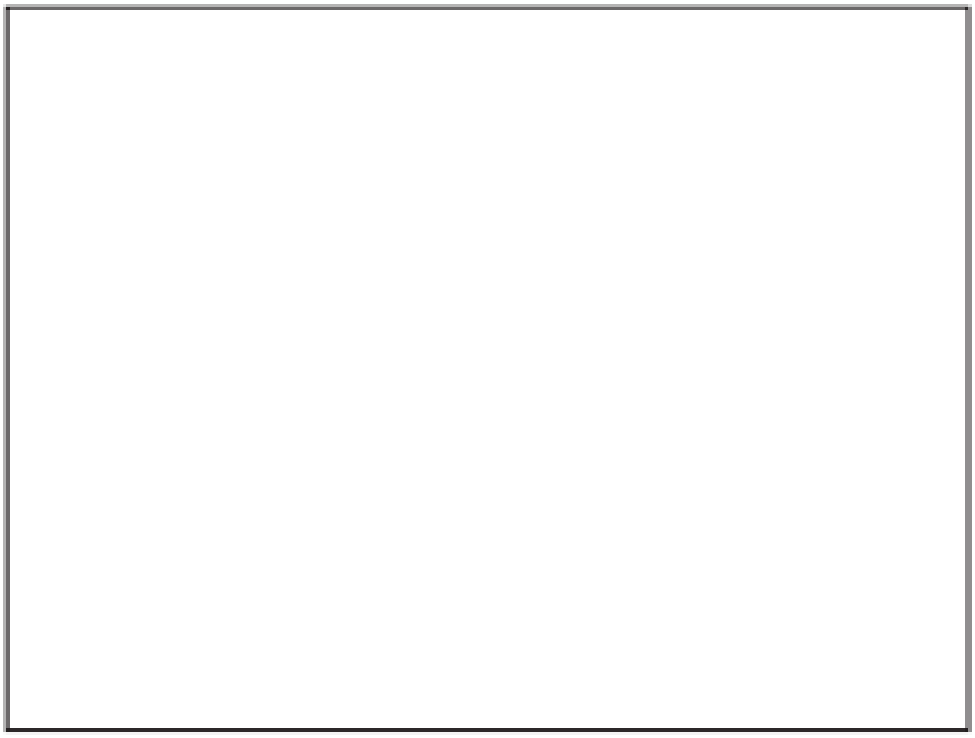
Complete the chart below based on your observations. Use words and/or drawings.

Date Time	Moon Description What Does the Moon Look Like? What is the Moon's Shape?	Position Where is the Moon in the Sky?	Other Notes
Day 1 _____/____/_____ Month/Date/Time			
Day 2 _____/____/_____ Month/Date/Time			
Day 3 _____/____/_____ Month/Date/Time			
Day 4 _____/____/_____ Month/Date/Time			

(Continued)

Date Time	Moon Description What Does the Moon Look Like? What is the Moon's Shape?	Position Where is the Moon in the Sky?	Other Notes
Day 5 _____/____/_____ Month/Date/Time			
Day 6 _____/____/_____ Month/Date/Time			
Day 7 _____/____/_____ Month/Date/Time			
Day 8 _____/____/_____ Month/Date/Time			
Day 9 _____/____ Month/Date			
Day 10 _____/____ Month/Date			

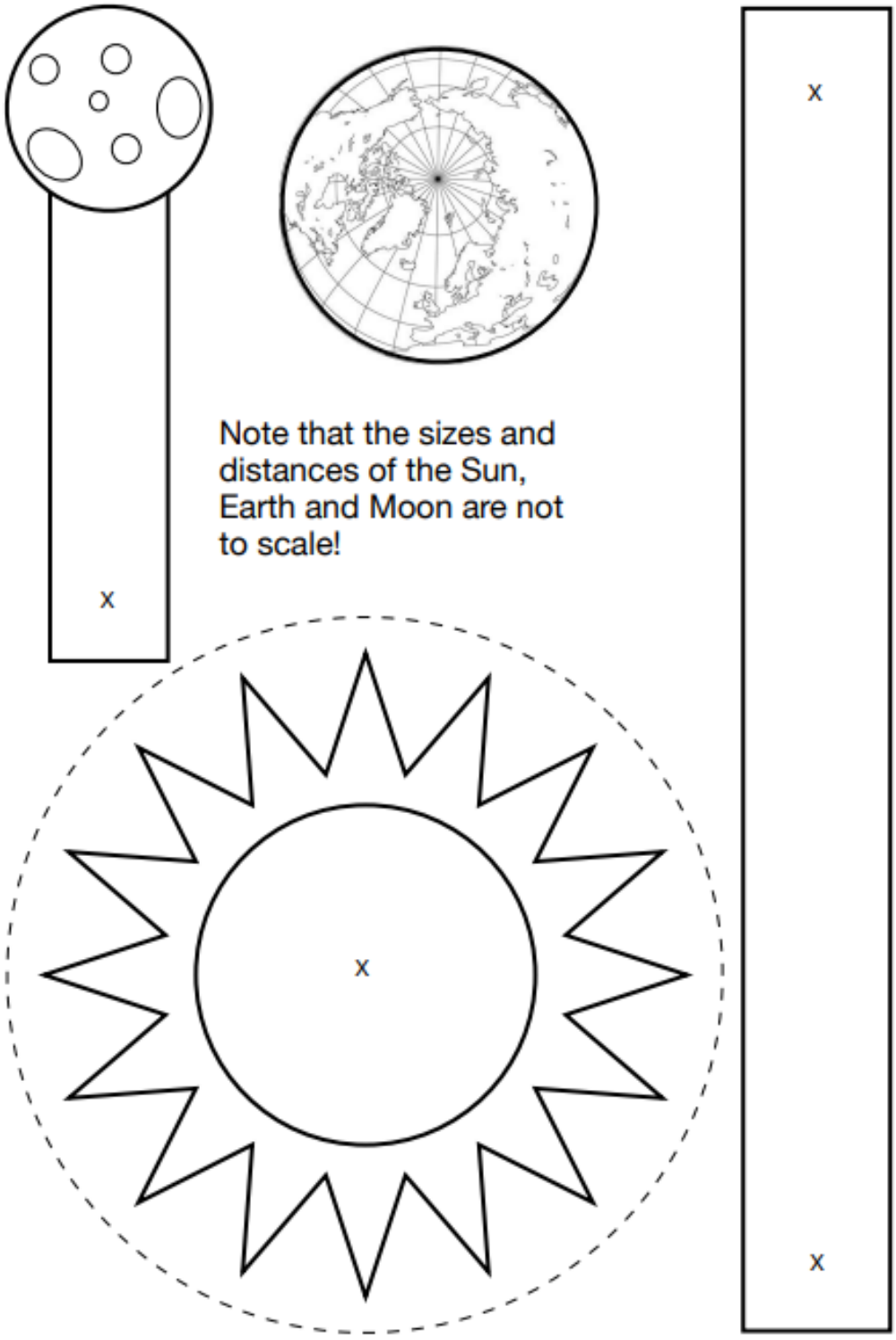
I discovered…



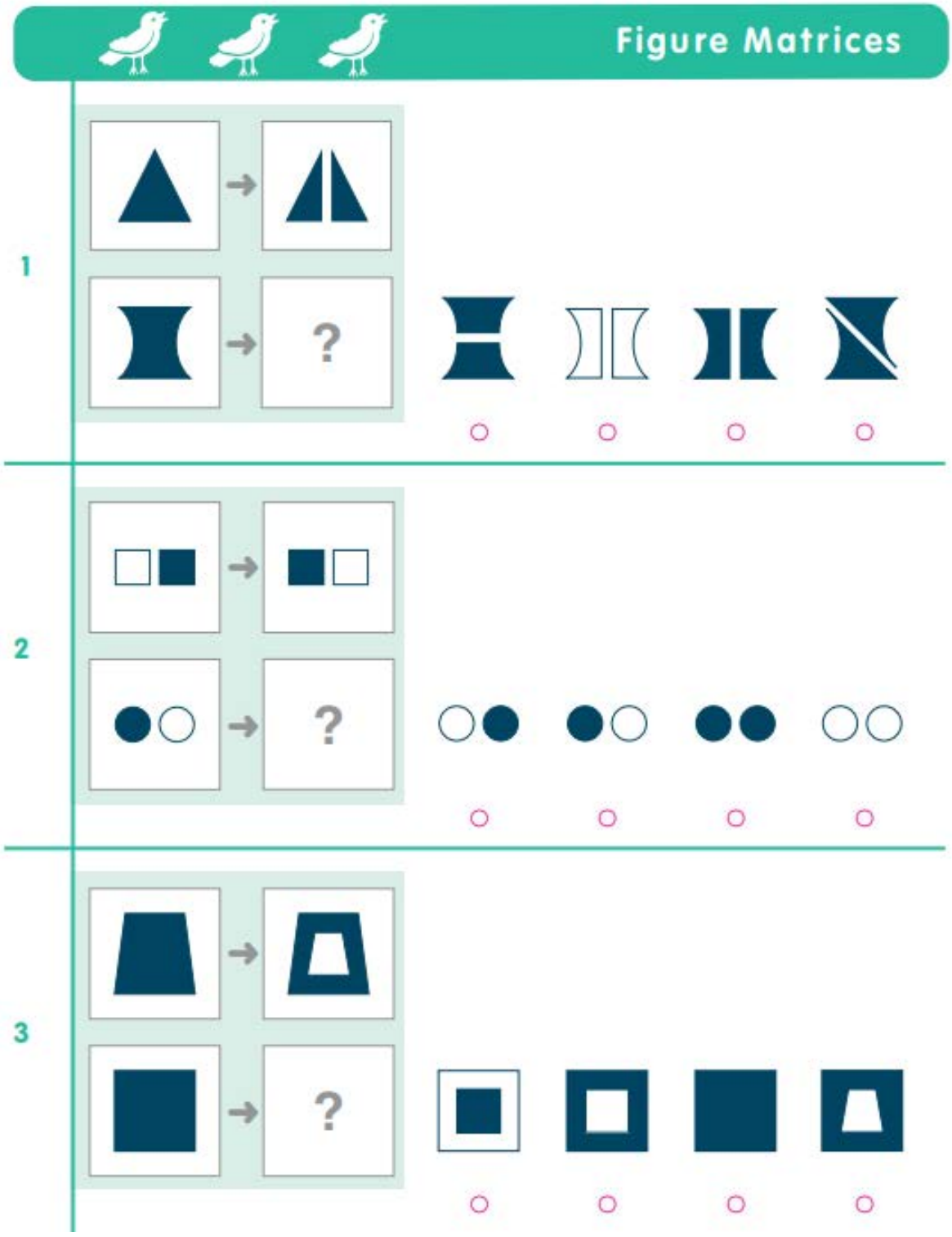
APPENDIX K: SUN, MOON, AND STARS STORY CHOICE BOARD

Name the planets in our solar system? Which is the largest? What makes up Saturn's rings? What tool do we use to study the sun? How would you describe the Moon's surface?	Exploring the universe through space travel and using tools like telescopes costs a great deal of money. Do you believe this money is well spent? What benefits come from space exploration? Take a position and defend your decision.	How does the phase of the moon affect how you see the stars in the night sky? Why is Earth the only planet in our solar system that has life? What characteristics does Earth have that other planets do not?
What courses would you take in order to be an astronaut? What do astronauts need to know and be able to do in order to do their work? What would be easy and what would be challenging about being an astronaut?	How does the Earth's orbit and tilt create day/night and our seasons?	Why does the moon look different each night? What would you say to someone why says that part of the moon disappears during parts of the month?
Create a list of items that would be needed for a space flight to mars? Include items that would be needed (food, water, etc.) and things that would be good for entertainment. Give a reason for each item on your list.	If people from Earth are going to live on Mars, what kind of buildings would be needed to support life? How would food be grown? Where would energy come from?	Use electronic and print resources to identify one problem with space travel. Describe the problem and propose a solution.

APPENDIX L: ORRERY MODEL

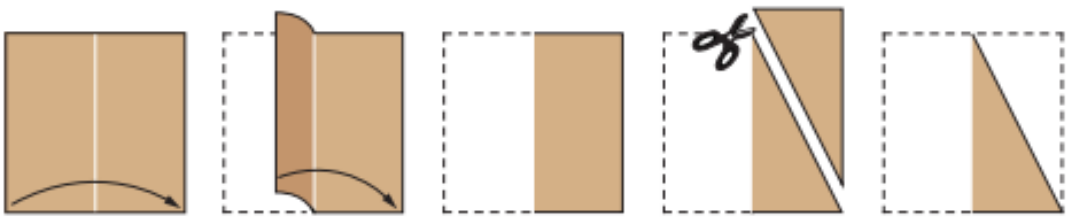


APPENDIX M: SAMPLE PATTERN RECOGNITION TASKS



Paper Folding

1



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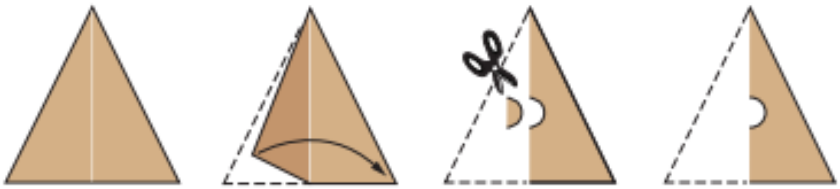

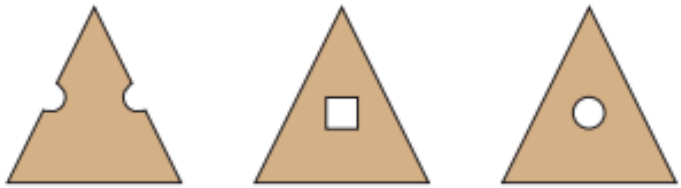

Figure Classification

1

2

3

4

APPENDIX N: SEED LESSON K-W-L CHART

U-STARS~PLUS

Week Two Science Exploration

Nature Walk	***Seeds***
What plants do you recognize. Write the plants name and describe it if possible. _____ _____ _____ _____	What do you already know about seeds? List words that you think of descriptions, anything that comes to mind when you think about seeds. _____ _____ _____ _____

Lima Bean (Seed) Dissection

With a partner or two people, carefully dissect the two lima bean seeds that you are given and make your observations here. Try to make at least two qualitative and two quantitative observations for each bean. Draw the outside of the bean and what you see when you open the bean with your plastic knife.

Qualitative data are descriptions (shiny, rough, reminds me of a …). This can also be your drawing.

Quantitative data are typically numbers or measurements (it weighs as much as a penny, it is 4 cm long)

Drawing and Observations of the Dry Lima Bean Seed	**Drawing and Observations of the Soaked Lima Bean Seed**

U-STARS~PLUS

Week Two Science Exploration

Things I Already Know About Seeds	Seeds Must Have
Seeds Also May Want/Need Seeds Do Not Like	The Mass of Plants/Trees Comes From

Seeds

APPENDIX O: STEM BRIDGE CONSTRUCTION CHALLENGE

BRIDGE TEST DIRECTIONS

1. With your group, develop a design for your bridge.
2. Gather materials, spending not more than $5 of classroom cash.

   You may purchase some materials and return later to purchase more.
3. Construct your bridge using on the materials purchased from the classroom store.
4. Test the bridge height.

   Put the abutments of your bridge on the model.

   Place the model car (or boat) under your bridge. Be sure there is enough room for the boat or car to pass under your bridge.
5. Test how safe your bridge is for cars. Place the toy car in the center of your bridge to test for stability. Add more cars if you want to test your bridge with more of a load.

APPENDIX P: CYBORG HUMAN MACHINE LESSON

Cyborg Human Machine Family Science Activity is copyright protected and shared here with permission of Dr. Mary Ruth Coleman.

Cyborg: the Human Machine

Family Science Activity

Due Date: _____

This activity helps you learn about...

Technology: Simple Machines

- types and use of technology

Living Organisms: Humans

- body movement, parts and function

This activity involves...

Collecting data, communicating, inferring, interpreting data, observing

Activity Duration

Allow 3–5 days to complete this activity.

What are we doing?

In this activity, your scientist will look at how his or her own body acts like simple machines. These "machines" (body parts) help us do things more easily. Your scientist will also look for simple machines in and outside of your home.

How are we going to do this?

In this activity, you will investigate different body parts and how they work like simple machines. You will also look for simple machines around your home.

Day 1

1. Look closely at how your body moves and works. Walk around your home and do some simple tasks like picking up a book. Determine at least 3 body parts that act like simple machines. Think about what machine each body part imitates and what type of job it performs. Record your thinking on the Observation Record.

Days 2–5

1. Choose two locations to look at machines. Places could be your home, neighborhood, laundromat, park, or grocery store.
2. Pick one location each day and watch people using machines/toys to make their jobs easier and to have fun.
3. Look closely at the machines or toys. Pay close attention to at least two different simple machines that help make the larger machine or toy.
4. Observe the way the simple machines move. How do the parts move or perform like your body parts?
5. For Steps 2–5, record your thinking on the Observation Record.
6. Finish your Observation Record and discuss the Family Time questions that follow.
7. Bring your Observation Record and packet to school by the date due.

Family Time Questions

1. Which of our body parts make work easier for us? Explain how these body parts help our lives.
2. What simple machines do we use every day to help us? How do they help us make life easier?

Family Notes

- There are six "simple machines": wedge, screw, lever, pulley, inclined plane, and wheel. Many machines are made up of multiple different simple machines (e.g., bicycle, car, hand-mixer, car jacks). These are called *compound machines*.
- It is not necessary to drive and visit a new location every day. Your scientist may use two rooms in your own home.
- On the Observation Record, all responses are acceptable; no answer is right or wrong. For the "I discovered" section, any thoughts are welcome.
- Encourage your scientist to record what she/he observes and thinks about the activity. Words or drawings may be used to record the observations.
- Your scientist may need help to complete the activity and fill out the Observation Record. Please partner with your child on this activity.

Family Science Observation Record

Cyborg: the Human Machine

Name: _____

Date: _____

Human Body Investigation

Describe your observations below. Use words and/or drawings.

Body Part	Job(s) It Performs	Simple Machine Connection

Machine Exploration

Describe your observations below. Use words and/or drawings.

What You Observed	Where?	Simple Machine Connection	Similar to What Body Part and Movement
Example: Dump Truck	***Toys in family room***	***Wheel, inclined plane, lever***	***Legs, arms Lifting & pulling***

I discovered...

APPENDIX Q: STEM BRIDGE CONSTRUCTION PURCHASE SHEET

Bridge Supply Purchase Order

Team Name: _____ Teacher's Name: _____

Team Members: _____

		# Straws 9 cents each	# Craft Sticks 8 cents each	# Index Cards 11 cents each	Paper clips 4 cents each	Rubber Bands 3 cents each	String 6 cents per foot	Clear Tape 10 cents per foot	Masking Tape 15 cents per foot	Plain Paper 7 cents per sheet	Total Cost
Supply Order 1	Number of Items										
	Total Cost For Items										
Supply Order 2	Number of Items										
	Total Cost For Items										
Supply Order 3	Number of Items										
	Total Cost For Items										

APPENDIX R: EAST CAROLINA COUNTY SCHOOLS REFERRAL

EAST CAROLINA COUNTY SCHOOLS AIG 1
Academically or Intellectually Gifted Referral

Student _____ **PowerSchool #** _____ **DOB** _____

School _____ **Grade** _____ **Race** _____ **Gender** _____

Teacher _____ **Referred By** _____ **Relationship** _____ **Date** _____

Parent/Guardian(s) _____ **Phone #** _____

Address _____

Parent/Guardian(s) Email _____

School Performance and Motivation Completed By: _____

School Performance Data	Reading	Math
Classroom Grades Current Averages, Past Quarter and/or Semester Averages		
Standardized Testing (BOG/EOG/EOC) Year, Name, & Percentile		
Observations/Comments You may use the back of this referral if you need additional space to further describe this student.		

Motivation Characteristics	Not Observed	Hardly Ever	Some-times	Often	Almost Always
Shows pride in work	☐	☐	☐	☐	☐
Strives to achieve, wants to perform at the highest possible level	☐	☐	☐	☐	☐
Reacts to challenges enthusiastically	☐	☐	☐	☐	☐
Approaches situations expecting to do well	☐	☐	☐	☐	☐
Places high value on mastery and success	☐	☐	☐	☐	☐
Works tenaciously, not easily discouraged	☐	☐	☐	☐	☐
Sets high standards for his/her performance	☐	☐	☐	☐	☐
Sets challenging goals	☐	☐	☐	☐	☐
Takes on new and difficult tasks or projects	☐	☐	☐	☐	☐
Strives to improve or become more competent	☐	☐	☐	☐	☐
Persists on tasks even when initial efforts are not successful	☐	☐	☐	☐	☐
Attempts tasks that are above current skill level	☐	☐	☐	☐	☐

AIG Match Team Decision: ☐ Do Not Conduct Evaluation ☐ Yes--Conduct Evaluation

AIG Specialist or AIG Contact _____ Date _____

Revised July 2020

APPENDIX S: STRAW ROCKETS INTEREST WORK

Straw Rockets
Interest-Work

Guiding Question: How can the energy of my breath be used to launch a rocket?

Directions:

1. Gather markers, crayons, or colored pencils to decorate your rocket. Gather your straw, tape, and scissors.
2. Decorate one (or more rockets)
3. Take your larger straw and tape over one end of the straw to close it off.
4. Tape the larger straw to the back of your rocket and cut it so that the open end is at the bottom of the rocket cutout.
5. Cut the straw so that it is the same length as your paper rocket.
6. Insert the smaller straw into the straw you taped to the back of your rocket.

7. You are ready to launch! Blow quickly into your straw and notice what happens.

Questions to think about:

How can you make your rocket fly farther?

How does the angle that your rocket is launched affect how far it travels?

Can you set up a way to launch your rocket and hit a target that is 1 foot away? 2 feet? 5 feet?

Is there a way for you to improve your rocket to increase the distance it will travel?

Is there a way to cause your rocket to fly (or glide) in a straight path?

APPENDIX T: WATER ROCKET PREDICTION SHEET

Water & Air Pressure Powered Soda Bottle Rockets Name: _____

Fill in the "My Prediction" column using the following amounts of water. Which do you think will propel the rocket to the highest altitude? Continue down to the amount of water that you think will result in the lowest launch height.

1750 mL	1250 mL	750 mL
500 mL	250 mL	0 mL

	My Prediction	Actual
Highest Flight		
Next Highest		
Third Highest		
Fourth Highest		
Fifth Highest		
Lowest Flight