Executive Summary

The following analysis is based on the Orange County AIG growth data on the 2010-2011 EOG exam as given by the Orange County Division of Testing and Accountability in Spring 2012. Several of the factors influencing gifted students’ achievement, as identified in the literature review, were mathematically examined to test potential correlation to achievement. Overall trends include higher rates of negative growth in math than in reading, with twice the number of schools showing negative growth for over one quarter of AIG students in math than in reading (see Appendices A and B). Comparing both the average growth rates of AIG students and the percentage of students showing negative growth to various factors, including school size, class size, program size, school performance, and economic disadvantage, no strong correlations are found. This begs further research to identify potential factors influencing the trend of negative growth, such as methods of identification, instructional methods, and teacher quality.

Research Questions in the Literature and Orange County

1. How does school size impact AIG student growth?

   While school size has the potential to affect student achievement based on cost efficiency in per-pupil expenditures, studies relating school size to students’ achievement produce conflicting results with relatively small correlations (Slate 2005). The average percentage of students showing negative growth in Orange County Schools was higher for the schools above the median size of 491.5 compared to those below the median size for both reading and math (see Appendix C). This generally supports the hypothesis that smaller schools may be able to provide more individual attention for AIG students, boosting growth.
2. How does class size impact AIG student growth?

While reducing class size is an appealing policy option due to its relative ease of implementation, conflicting evidence exists regarding its effectiveness in increasing student achievement (Southworth 2010). A landmark study in Tennessee shows that reduced class size has a positive impact on student achievement, especially for minority and low-income students (Krueger 2001). There is no significant difference between the average overall growth rates of AIG students in Orange County at schools with average class sizes of less than the median of 22.5 for their grade than students at schools with average class sizes greater than 22.5 for their grade (see Appendix D). This refutes the hypothesis that smaller class sizes have a positive impact on AIG student growth.

3. How does program size impact AIG student growth?

The impact of class size may be extended to AIG program size, with smaller program sizes lending themselves to increased student attention. However, larger programs may garner more resources and be able to differentiate students more thoroughly than small programs. The data for Orange County generally supports the hypothesis that smaller AIG programs lend themselves to higher growth scores for their students. All but one of the programs below the median size for reading had less than one third of their students showing negative growth; in contrast, 75% of programs above the median size had more than one third of AIG students showing negative growth (see Appendix E). Results are more ambiguous for math.

4. How does overall school performance impact AIG student growth?

There appears to be a small correlation between school-wide achievement in Orange County and AIG student growth, with the trendlines moving in an upward direction when the outlier is removed (see Appendix F). This supports the hypothesis that higher levels of school
performance encourage higher AIG growth, or rather are indicative of environment conducive to positive student performance.

5. How do the demographics of the school, specifically level of economic disadvantage, impact AIG student growth?

In a 2010 study of student achievement in North Carolina, the authors find that the “racial and poverty composition of schools affect student achievement after factoring in student, family, and other school influences” (Southworth 2010). Poverty concentrations in schools, defined here as the number of students identified as economically disadvantaged, impact teacher inputs, resources, and peer achievement. Schools in Orange County with more students of economic disadvantage, as defined in Appendix G, tended to have a higher percentage of AIG students showing negative growth than did schools with less students of economic disadvantage. However, this trend only holds for reading and the difference is negligible for math. Teacher turnover, another indicator of unsatisfactory school conditions, does not appear to be impacted in Orange County by the number of economically disadvantaged students (see Appendix H).

6. How do AIG identification practices impact AIG student growth?

In Orange County, students may qualify for the AIG program based on EOG scores once taken. This may create an effect whereby students enter the program with high scores, either due to high aptitude or due to successful test-taking one or more times, and perform worse on the same exam in subsequent years due to changes in the factors that influenced their test-taking. These factors could include thorough preparation, an extraordinary teacher, or simply getting lucky. One way to mitigate these effects is to use different exams for identification and subsequent measures of achievement. In neighboring Durham County, AIG students are
identified by either the Woodcock Johnson III Achievement Battery or the Iowa Test of Basic Skills, in addition to aptitude assessment (Durham Public Schools 2010). The current available information does not lend itself to a thorough investigation of Orange County’s AIG identification practices, though further research may confirm or deny that identification practices have an impact on AIG student growth.

7. *How do instructional methods, both for the general classroom and for the AIG program, impact AIG student growth?*

The documented effectiveness of interventions for gifted underachievers has been inconsistent. While smaller student/teacher ratios and less conventional classroom environments may have positive short-term effects on student achievement, the long-term effects are less clear. Overall, when appropriate educational opportunities such as motivational teachers or stimulating curriculum are present, gifted underachievers tend to respond positively (Reiss 2000). Much of the research on gifted students finds that students grouped with academic peers outperform students placed in a general classroom, however it is important to remember that ability grouping on its own does little to promote gains in achievement. Gains are only seen when the groups experience differentiated content and pace of learning, either within a mixed-ability classroom or in an isolated setting. Site-specific research can help determine which instructional methods are being used for which students in Orange County to develop further recommendations for improvement.

8. *How does teacher quality impact AIG student growth?*

In regards to gifted education, the teacher-student relationship may be the most significant factor influencing achievement (Baker 1998). While the definition of teacher quality is a highly debated concept, there is no doubt that quality teachers have a strong impact on
students’ learning and achievement (Southworth 2010). Research shows that compared to other teacher qualifications, National Board Certification is one of the best measures of effectiveness (Goldhaber 2008). The number of National Board Certified teachers varies greatly in Orange County, showing little correlation to overall AIG student growth scores (see Appendix I). Teacher interviews will be a crucial component to assessing the quality of the teachers who teach AIG students in Orange County.

**Policy Recommendations**

Overall, the analysis with the initially provided data yielded minimal conclusions as to potential factors leading to high levels of negative EOG growth among AIG students in Orange County. One trend of note is the higher levels of negative growth among students identified in math than those in reading, which could be related to unknown influences such as teacher effectiveness or prior curricular experiences. While economic disadvantage does appear to have a slight impact on reading growth, this is largely not an issue the AIG program can address. The lack of correlation between class size, program size and growth suggests that what occurs in the classroom is more important than the size of the class, a conclusion supported by the literature. AIG identification practices, instructional methods, and teacher quality must be evaluated on a school-by-school, program-by-program basis, and cannot be examined via the data available at this time. Through the site visits and interviews, a more thorough assessment of the school-level factors affecting AIG achievement can be reached.
Works Cited


Appendix A: Orange County AIG Students’ Growth Scores on 2010-2011 EOG Exam

Average Growth Scores of AIG Students in Orange County Schools

Average Growth Scores of AIG Students in Orange County Schools

Average Growth of AIG Students on 2010-2011 EOG Exam

Reading
Math
Appendix B: Percentage of Orange County AIG Students Showing Negative Growth on 2010-2011 EOG Exam, by school and grade (marked for confidentiality)

Percentage of Orange County AIG Students Showing Negative Growth

% AIG Students Showing Negative Growth on 2010-2011 EOG in Area of Identification

- Reading
- Math
Appendix C: Impact of School Size

Negative Growth as a Function of School Size - Reading

% AIG Students Showing Negative Growth on 2010-2011 EOG Exam in Area of Identification

Number of Students in School

Negative Growth as a Function of School Size - Math

% AIG Students Showing Negative Growth on 2010-2011 EOG Exam in Area of Identification

Number of Students in School
Appendix D: Impact of Class Size

Orange County AIG Growth by Class Size

Average Growth of AIG Students on 2010-2011 EOG Exam

Average class size for grade studied within each school

- Reading
- Math
Appendix E: Impact of Program Size

**Negative Growth as a Function of Program Size - Reading**

**Negative Growth as a Function of AIG Program Size - Math**
Appendix F: AIG Program Growth vs. School-wide achievement on the EOG

Orange County AIG Growth versus School-Wide Achievement

Percent of Students Performing At or Above Grade Level on the 2010-2011 EOG Exam

Average AIG Student Growth Score on 2010-2011 EOG Exam

Orange County AIG Growth versus School-Wide Achievement

Percent of Students Performing At or Above Grade Level on the 2010-2011 EOG Exam

Average AIG Growth Score on 2010-2011 EOG Exam

Reading
Math

Reading
Math
Linear (Reading)
Linear (Math)
Appendix G: Impact of Economic Disadvantage

*More economically disadvantaged defined as having a higher percentage of economically disadvantaged students, as indicated by the number of ED-identified students taking the 2010-2011 ABC End-of-Grade test

*Less economically disadvantaged defined as having a lower percentage of economically disadvantaged students compared to the other schools studied (elementary and middle combined)

Average Percentage of AIG Students Showing Negative Growth in Schools of More and Less Economic Disadvantage – Reading

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Average Percentage of AIG Students Showing Negative Growth in Schools of More and Less Economic Disadvantage – Math

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<td>% Positive</td>
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Appendix H: Impact of Economic Disadvantage on Teacher Turnover

Impact of ED on Teacher Turnover

![Graph showing the impact of economic disadvantage on teacher turnover.](image)
Appendix I: Sample Questionnaire for AIG Teachers in Orange County

1. What differences do you notice between students in your AIG program who are achieving growth and those who are not? What factors might be contributing to the underachievement of certain students?

2. How would you describe the selectivity of your AIG program, in terms of the number of students selected out of those being considered? How do you think selectivity plays a role in the achievement of students in the program?

3. What are the current methods of instruction used in your school’s AIG program?

4. To what extent does differentiated instruction, defined here as using various instructional methods to meet the needs of all students in a mixed-ability classroom, occur in general classrooms and interact with AIG-specific instruction?

5. What do you see as barriers to effective differentiated instruction in the general classroom? How much emphasis should be placed on differentiated instruction in creating a comprehensive system for gifted learning?

6. Why do you think students in the AIG program are failing to meet projected growth on EOG exams in reading and math?

7. What methods would you suggest to address the current trend of AIG students not demonstrating growth on the End of Grade tests?