

## Chapter 52

# Instructional Technology and the Nature of the Gifted and Talented

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### ABSTRACT

*This collective case study explores the use and impact of instructional technology on fourth grade Gifted and Talented (GT) students' engagement and motivation to learn. Through this exploration, the authors were able to modify their use of instructional technology to suit the needs of the heterogeneous group of GT learners. Although the level of use, purpose for use, and how students used the instructional technology varied between the courses, this case reveals that the heterogeneous nature of the GT students necessitated a flexible approach to instruction and use of IT in order to maintain high levels of engagement and motivation. While these findings are not novel, they add to the discourse regarding teachers' perceptions of GT students and how those perceptions inform instructional practices. This chapter intends to stimulate critical self-reflection regarding perceptions of GT students and the impact those perceptions have on instructional practices.*

### ORGANIZATION BACKGROUND

The gifted and talented education program (GATE-P) is the enrichment program for GT students in a local school district in the Southwest region of the United States. The program from which we

drew our sample is a collaborative partnership between a local university and the public school district. Through this program fourth and fifth grade students, during different semesters, come to the university campus once per week, over 12 weeks, to engage in a self-selected enrichment

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course. These courses span a range of content and skills such as, principles of science, technology, engineering, and mathematics (STEM) using robotics, business and marketing principles through the development of products that are later sold, theatrical arts, visual art, computer programming, and science. Prior to enrollment in the program, students are provided a menu of course offerings from which to select. Typically, students are able to enroll in their first or second choice, which aligns well with the students' personal interest in the topic. Since this is a designated GT program, all students have already undergone assessment to determine if they are identified as GT.

The GT identification process and criteria are very diverse and broad thereby generating diversity among the participating GT population. Specifically, the school district's "gifted services are designed for students who demonstrate significantly above-average achievement or potential in the areas of general intellectual ability, specific subject matter aptitude, and creative/productive thinking skills. Criteria for selection include cognitive skill tests, professional recommendations, classroom performance and portfolio samples" (School District, 2013).

The subjects in the case were three classrooms of students identified as gifted by their school district. Student data provided by the district gave the instructors a minimal level of understanding of the giftedness of their students and their learning needs, but standardized test score data were available for 58 students. The data was heavily redacted, which prevented the authors from performing detailed analysis and matching standardized scores with individual student performance in class. Selected statistics are presented in Table 1.

The range of verbal and non-verbal results for the most-used standardized test is illustrated in Table 2. The available data suggests that the 4 students who scored poorly on the Cognitive Abilities Test (CogAT) managed to gain entry into the GT program based on excellent scores on other exams such as the Otis-Lennon School

Ability Test (OLSAT) or Naglieri Nonverbal Ability Test (NNAT).

As expected with the sample population, the student test scores generally fell within the top percentiles. As illustrated in Figure 1, the data was leptokurtic with only a small percentage of the scores below 85%. In this case, four scores fell below the 85<sup>th</sup> percentile.

## **Setting the Stage**

Three different instructional technology (IT) - utilizing courses were specifically designed for fourth grade GT students. In these courses, the authors either used IT as the focus of the curriculum or as an integrative tool. The two uses of technology allowed for the examination of the effect IT had on class dynamics related to student collaboration, self-efficacy, and confidence to use IT by

*Table 1. Median value of standardized test scores*

|                     | Verbal | Non-Verbal | Quant | Composite |
|---------------------|--------|------------|-------|-----------|
| <b>CogAT (n=39)</b> | 92.0   | 97.0       | 93.5  | 96.0      |
| <b>WISC (n=5)</b>   | 98.0   | 97.0       | -     | 98.0      |
| <b>OLSAT (n=27)</b> | 97.0   | 97.5       | 92.0  | 98.0      |
| <b>NNAT (n=11)</b>  | -      | 99.0       | -     | 99.0      |

*Table 2. Descriptive statistics for the CogAT standardized test*

|                       | Verbal | Non-Verbal | Quant | Composite |
|-----------------------|--------|------------|-------|-----------|
| <b>Mean</b>           | 85.8   | 93.2       | 90.1  | 94.1      |
| <b>Median</b>         | 92.0   | 97.0       | 93.5  | 96.0      |
| <b>Std. Deviation</b> | 14.3   | 7.9        | 10.4  | 5.8       |
| <b>Minimum</b>        | 38.0   | 57.0       | 55.0  | 73.0      |
| <b>Maximum</b>        | 98.0   | 99.0       | 99.0  | 99.0      |
| <b>Count</b>          | 39     |            |       |           |

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