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Kristen Budreau

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TALENTED AND GIFTED TEACHING METHODS: ARE TEACHERS PREPARED TO
TEACH THE TALENTED AND GIFT

by

Kristen Budreau

A thesis submitted in partial fulfillment of the requirements
for graduation with Honors in the Education

Laurie J. Croft
Thesis Mentor

Spring 2017

All requirements for graduation with Honors in the
Education have been completed.

Laurie J. Croft
Education Honors Advisor

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Abstract

This paper explores syllabi and assignments from the teacher education program at the University of Iowa to determine whether required classes explicitly prepare future teachers to work effectively with talented and gifted students. A checklist is used to determine if the syllabi and assignments include the important topics in gifted education future teachers need to know to be satisfactory teachers of talented and gifted students. The syllabi and assignments looked at show a lack of information pertaining to talented and gifted students and gifted education in general. Preservice teachers leaving the teacher preparation program at the University of Iowa are expected to work with talented and gifted students in their future positions; however, those future teachers are not being educated on the best practices in gifted education. The findings conclude preservice teachers at the University of Iowa are not being prepared to work with talented and gifted students when they leave the teacher education program.

Talented and Gifted Teaching Methods:

Are Teachers Prepared to Teach the Talented and Gifted

When I was in elementary school I was a part of the “pull-out” program for talented and gifted students. There was one group for talented readers and one group for students with high mathematics ability. I was in the group of talented mathematics students. We would go to a special classroom a few times a month and work on extra math problems. I never thought much about it other than I got to leave my regular classroom and do some fun problems for an hour and then return to the rest of my class. Looking back, I realize that “pull-out” program did not do much for me other than inspire excitement for getting to miss part of class. As a pre-service teacher, I now understand why my teachers did not do anything other than this “pull-out” program for me. It is because we are not taught very much, if anything, about gifted students and their needs.

I am in my final semester in the College of Education before student teaching, and as I look back at my time here and the classes I have taken, I realize how little was mentioned about gifted education. We took an entire class on special education, and in Classroom Management, we had units about special education and English-as-a-second-language students, but nothing about gifted education. Until I started taking the gifted education classes that would lead to a Talented and Gifted Endorsement, I thought students could only be talented and gifted in reading, mathematics, or both. Now that belief sounds crazy to me, but what about all the other pre-service teachers that have never had any formal education about gifted students?

When thinking about the lack of information presented about gifted education, I decided I wanted to look further into this to see if my memories were correct. I started to look through past syllabi and course assignments to see if I could identify anything remotely related to gifted

education. My research is limited to the mathematics education courses and the general education courses such as Classroom Management and Human Relations, so I will not draw any conclusions about the other content area courses or the Elementary Education courses.

Literature Review

Mathematically Gifted Students

Mathematically gifted students are students that not only excel in mathematics, but according to the National Council of Teachers of Mathematics, have high motivation, are eager to learn new mathematical topics, can concentrate for a long time on mathematics, spatial reasoning, the ability to notice errors in reasoning, and are also creative in mathematics (Chamberlin, 2006, p. 462). Mathematically gifted students are also able to determine accurate solutions with great speed, identify relationships between mathematical concepts or ideas without formal instruction, and may also skip steps in solving problems and not be able to explain why their answer is correct (Rotigel, 2004).

Gifted students have a different way of reasoning than their non-gifted peers. The students can easily see similarities and differences and compare quantities more successfully (Chamberlin, 2006). These students tend to want to know the “hows” and “whys” behind the mathematics, rather than the more traditional procedural processes. Because the students are asking questions based on conceptual understanding, they tend to be stronger in understanding concepts than computation and therefore may show an “uneven pattern of mathematical understanding and development” (Rotigel, 2004, p. 47-48). NEED PAGE NUMBER

Mathematically gifted students have a different set of needs than the traditional student. Students who are gifted in mathematics need a more in-depth approach to problem solving and mathematical thinking in general. The students need the opportunity to solve problems that are

more complex in nature and are typically more open-ended. The traditional curriculum is not going to be sufficient enough to meet the needs of gifted learners. These students will need more advanced curricula and access to advanced materials in order for them to reach their full potential (Rotigel, 2004).

Teaching Mathematically Gifted Students

Mathematically gifted students are a subsection of all gifted learners and may also be gifted in another area such as performing arts or leadership. These students are a very diverse group and therefore, will need a curriculum that reflects that diversity (Assouline & Lupkowski-Shoplik, 2011). Teaching these students requires much more preparation than teaching other students in the mathematics classroom because these students need to be challenged more extensively. Students who are gifted in mathematics and poorly challenged will seek less challenging mathematics classes in the future, as opposed to students who have been challenged and search for more challenging mathematics courses (Chamberlin, 2006).

According to Johnsen, Rysel, & Assouline (2014), teachers should be prepared to offer enrichment opportunities and acceleration within mathematics (Johnsen et al., 2014). Teachers also have many other options for teaching the mathematically gifted, including differentiation, pre-testing, and compacting (Rotigel, 2004). Johnsen et al. (2014) says, “teachers are key in developing students’ interest in mathematics and differentiating the curriculum” (Johnsen et al., 2014, p. 116). Differentiating the curriculum can provide an appropriate pace for students, offer more in-depth problems, incorporate creativity, engaging students in different opportunities, and focus on broader concepts (Johnsen et al., 2014).

Teachers of mathematically gifted students will need to enrich and differentiate the curriculum so that students are being challenged enough to meet their needs. Students need a

curriculum that “addresses their strengths and increases their passion for mathematics” (Johnsen et al., 2014, p. 115). The Common Core State Standards were not developed in a way that automatically accommodates gifted learners. In order to enrich and differentiate the Common Core State Standards, teachers need to know the characteristics of gifted learners. Appropriate differentiation would not happen without the teacher’s understanding of acceleration and enrichment strategies (Johnsen et al., 2014).

Spending time producing complex problem solving and determining what the students are interested in and find challenging should be a common task performed by teachers of mathematically gifted students. Students should be given the opportunity to problem solve their way through a situation in order to develop algorithms on their own. Students should also be asked to create problems that are open-ended to promote critical thinking skills, and students should work in groups with similar-ability peers to discuss the mathematics (Chamberlin, 2006).

Assessment is the next important topic in teaching mathematically gifted students. High-ability students will need to have their problem solving and application skills assessed in a timely manner. Sometimes students will even need above-level assessments so the teacher can see if the student is ready to be accelerated. Teachers need to be using a variety of assessments that determine a students’ need for differentiation in the classroom (Johnsen et al., 2014). Pre-assessments can also be used so that students who have mastered a concept can have the opportunity to work on more challenging problems or move on to another topic (Byrd, 2016).

There are some qualities that a teacher of the mathematically gifted should have. These teachers should know the mathematics well above the level they are teaching. Then they must always be alert, they must not make faster learners slow down for the slower members of the class. They should communicate high standards for student performance, and they must respect

their students' abilities, providing adequate support. Teachers should be sensitive to varying levels of ability while still being able to challenge the student. They should be a role model, sharing their enthusiasm towards mathematics, and remaining flexible and ready to deal with challenges (Karsenty, 2014).

Karsenty (2014) believes that good mathematics teachers can become successful in meeting the needs of mathematically gifted students with the proper training (Karsenty, 2014). These teachers need to have a “strong mathematical formal education,” and should be able to improve their knowledge and teaching strategies through interactions with the gifted students (Karsenty, 2014, p. 172). The profile of a qualified mathematics teacher of the gifted is rarely addressed in the literature and is “a neglected aspect of research on mathematics giftedness” (Karsenty, 2014, p. 161).

Best Practice in Gifted Education

The National Association for Gifted Children (NAGC) has developed a list of six standards for gifted education programming. The standards are designed to “increase the focus on diversity and collaboration” (<https://www.nagc.org/>). The goals of the standards are focused student outcomes, not just teacher practices, and are appropriate for gifted students at all levels of development. The six standards include learning and development, assessment, curriculum planning and instruction, learning environments, programming, and professional development.

The first standard, learning and development, encourages educators to learn about the characteristics and developmental differences of gifted students in order to encourage academic growth for students at school and at home, ensuring intended outcomes are being achieved. The next standard, assessment, involves the use of assessments to provide data on identification and to evaluate student progress as well as the programming in place for talented and gifted students.

The third standard, curriculum planning and instruction, suggests that educators should apply research-based models of curriculum and instruction, as well as attending to students' needs by "planning, selecting, adapting, and creating culturally relevant curriculum"

(<https://www.nagc.org/>).

The fourth standard, learning environments, encourages educators of talented and gifted students to create environments that are conducive to learning and that foster social growth and communication skills. The next standard, programming, is a broad category that focuses on programming that can meet "the cognitive, creative, and affective development" of gifted students. Educators are expected to systematically cultivate, implement, and manage services for students that are gifted. The last standard, professional development, is all about the professional development of educators, facilitating continued learning about talented and gifted education and the standards developed by NAGC (<https://www.nagc.org/>).

Teaching students who are talented and gifted requires many different understandings such as investigating teaching styles and environments that best meet the needs of gifted learners and exploring the characteristics of a student who is gifted (Karsenty, 2014). There are also skill sets that a teacher should have when teaching students that are gifted, and those can be separated into three different categories: "cognitive-intellectual, personal-social, and pedagogical-instructional" (Karsenty, 2014, p. 162). Gifted learners tend to value the personal-social area with qualities such as recognizing differences between individuals and being imaginative (Karsenty, 2014). Teachers of gifted learners need to be able to "adapt their teaching strategies to accommodate the students' unusual thinking strategies," along with setting realistic expectations for the students and being aware of the different characteristics gifted students have (Rotigel, 2004).

Methodology

In considering whether or not the College of Education at the University of Iowa is preparing its preservice teachers to teach talented and gifted students, I examined syllabi and assignments for the 11 courses required for secondary education teacher candidates. The syllabi were downloaded from the online class sites for each course, and they reflect coursework offered from Spring 2014 to Fall 2016. For each syllabus, I used the 'find' function and searched for key words or phrases (see Appendix A). For each assignment, I used descriptions of the assignments found in the syllabus and past experiences in each class to determine if assignments addressed issues in talented and gifted education (see Appendix B). The results of this study will suggest opportunities for understanding future gifted students and whether the students graduating from the College of Education at the University of Iowa, are prepared to teach talented and gifted students in a way that will allow those students to succeed at the highest potential.

Results

Of the 11 syllabi I examined (see Appendix A), five referenced assessment, but not in terms connected to talented and gifted students. Two referenced "gifted", "talented", "high-ability", or "advanced learner/student". The syllabus for the *Orientation to Secondary Education* course listed the words "talented" and "gifted" in the schedule in the syllabus. The syllabus for the *Foundations of Special Education* course listed the word "assessment", focusing on special education, and "gifted" and "talented" in the schedule in the syllabus. The other four syllabi for *Introduction and Practicum: Mathematics; Educational Psychology; Methods: Middle School Mathematics; and Methods: High School Methods*, all reference assessment but mention nothing about talented and gifted students.

From the 11 courses that I studied for this project (see Appendix B), I examined and reflected on 35 assignments. Two of the 35 assignments stressed the importance of planning for students of all abilities; one assignment appeared in *Methods: High School Mathematics*, and the other, in *Secondary Classroom Management*. Both assignments were designed to encourage future teachers know the students, and therefore stressed the teacher's use of language that would reflect students of all abilities. Three of the assignments asked students to include differentiation; however, they did not specifically reference talented and gifted students or high-ability or advanced students. Two assignments that included differentiation were from *Methods: High School Mathematics* and the other one was from *Methods: Middle School Mathematics*. All three assignments reviewed around lesson plans and had a section for "advancing questions" or "early-finisher" activities. None of the assignments referenced gifted, talented, high-ability or advanced students. Of the 35 assignments, 30 of them did not include any reference connected to talented and gifted students or best practice in gifted education.

Discussion

After carefully examining the syllabi from the required classes, only two listed the words "talented" and "gifted". Five of the syllabi did include information about assessment in general, but neglected to reference any information about talented and gifted students or differentiated teaching practices for advanced learners. Teachers will not only have talented and gifted students in their classroom, but also will need to teach those students so they make continual educational progress. When the courses provided by the College of Education at the University of Iowa are not including the nature and needs of a talented and gifted student, how are teachers supposed to know how to identify and serve talented and gifted students in their classroom?

The specific assignments required in these courses also fall far from the mark in facilitating understanding of methods for teaching talented and gifted students. None of the 35 assignments I looked at included any specific requirements about talented and gifted students. Two assignments stressed the importance of students of all abilities, but with a focus on getting to know students, rather than teaching. Three of the assignments asked for some sort of differentiation, but differentiation was never discussed in the course and students were never given any sort of guidance as to why differentiation is important. The assignments given in the courses required by the College of Education should reflect what is expected of teachers and provide adequate understanding of talented and gifted education. Because all teachers will encounter talented and gifted students, pre-service teachers need to be trained on how to work with those students. The best way for pre-service teachers to learn about talented and gifted students is through hands-on work and assignments that reflect an actual experience with talented and gifted students.

Limitations

The syllabi examined for this research reflect the course as taught during a specific semester and may not reflect the current content of the class. The assignments also reflect assignments during a specific semester and what I can recall about the assignment. The assignments and the syllabus for each course reflect that course for the same semester. Each class may have had questions emerge that allowed for a discussion of the needs of talented and gifted students or best practice in gifted education that was not suggested by the syllabus or by the assignments.

Reflections on my Experience in the Teacher Education Program

During this project I also reflected on my time in the courses required by the College of Education at the University of Iowa. Over a period of almost three years, I remember only one time in which talented and gifted education was discussed in depth. During my final course, *Methods: High School Mathematics*, we heard from guest speaker Dr. Susan Assouline, Director of the Belin-Blank Center. Dr. Assouline discussed the importance of providing appropriate education to talented and gifted students. This one guest speaker is not adequate for students at the College of Education to learn about talented and gifted students or how to best teach them.

Reflecting on my time in the College of Education and the results of this project, it is clear that pre-service teachers at the University of Iowa are not being adequately prepared to work with talented and gifted students. The National Association of Gifted Children (NAGC) states, “It is critical that all teachers are able to recognize a high-ability student who may need more depth and complexity in instruction or be referred for further assessment and services” (<https://www.nagc.org/>). That being said, the NAGC also acknowledges that “most teachers do not receive any training in the needs of high-ability students or gifted education practices.” It is extremely important that the needs of talented and gifted students are met and without proper training, it cannot be expected that teachers will be able to meet those needs.

Appendix A

Checklist for Syllabi

- Does the syllabus include the term “gifted”, “talented”, “high-ability”, or “advanced learner/student”?
- Does the syllabus include the term “differentiation” or discuss methods of differentiating curriculum?
- Does the syllabus include the term “acceleration” or discuss forms of acceleration?
- Does the syllabus include any information about mathematically gifted, talented, or high-ability or advanced students?
- Does the syllabus include any information about assessment (pre-assessment or formative assessment) and/or feedback?
- Does the syllabus reference the NAGC, ITAG, or any other gifted education website or standards?

Checklist for Syllabi: Educational Psychology

- Does the syllabus include the term “gifted”, “talented”, “high-ability”, or “advanced learner/student”?
- Does the syllabus include the term “differentiation” or discuss methods of differentiating curriculum?
- Does the syllabus include the term “acceleration” or discuss forms of acceleration?
- Does the syllabus include any information about mathematically gifted, talented, or high-ability or advanced students?
- Does the syllabus include any information about assessment (pre-assessment or formative assessment) and/or feedback?
- Does the syllabus reference the NAGC, ITAG, or any other gifted education website or standards?

Checklist for Syllabi: Foundations of Special Education

- Does the syllabus include the term “gifted”, “talented”, “high-ability”, or “advanced learner/student”?
- Does the syllabus include the term “differentiation” or discuss methods of differentiating curriculum?
- Does the syllabus include the term “acceleration” or discuss forms of acceleration?
- Does the syllabus include any information about mathematically gifted, talented, or high-ability or advanced students?
- Does the syllabus include any information about assessment (pre-assessment or formative assessment) and/or feedback?
- Does the syllabus reference the NAGC, ITAG, or any other gifted education website or standards?

Checklist for Syllabi: Methods: High School Mathematics

- Does the syllabus include the term “gifted”, “talented”, “high-ability”, or “advanced learner/student”?
- Does the syllabus include the term “differentiation” or discuss methods of differentiating curriculum?
- Does the syllabus include the term “acceleration” or discuss forms of acceleration?
- Does the syllabus include any information about mathematically gifted, talented, or high-ability or advanced students?
- Does the syllabus include any information about assessment (pre-assessment or formative assessment) and/or feedback?
- Does the syllabus reference the NAGC, ITAG, or any other gifted education website or standards?

Checklist for Syllabi: Methods: Middle School Mathematics

- Does the syllabus include the term “gifted”, “talented”, “high-ability”, or “advanced learner/student”?
- Does the syllabus include the term “differentiation” or discuss methods of differentiating curriculum?
- Does the syllabus include the term “acceleration” or discuss forms of acceleration?
- Does the syllabus include any information about mathematically gifted, talented, or high-ability or advanced students?
- Does the syllabus include any information about assessment (pre-assessment or formative assessment) and/or feedback?
- Does the syllabus reference the NAGC, ITAG, or any other gifted education website or standards?

Checklist for Syllabi: Orientation to Secondary Education

- Does the syllabus include the term “gifted”, “talented”, “high-ability”, or “advanced learner/student”?
- Does the syllabus include the term “differentiation” or discuss methods of differentiating curriculum?
- Does the syllabus include the term “acceleration” or discuss forms of acceleration?
- Does the syllabus include any information about mathematically gifted, talented, or high-ability or advanced students?
- Does the syllabus include any information about assessment (pre-assessment or formative assessment) and/or feedback?
- Does the syllabus reference the NAGC, ITAG, or any other gifted education website or standards?

Checklist for Syllabi: Introduction and Practicum: Mathematics

- Does the syllabus include the term “gifted”, “talented”, “high-ability”, or “advanced learner/student”?
- Does the syllabus include the term “differentiation” or discuss methods of differentiating curriculum?
- Does the syllabus include the term “acceleration” or discuss forms of acceleration?
- Does the syllabus include any information about mathematically gifted, talented, or high-ability or advanced students?
- Does the syllabus include any information about assessment (pre-assessment or formative assessment) and/or feedback?
- Does the syllabus reference the NAGC, ITAG, or any other gifted education website or standards?

Appendix B

Checklist for Assignments

- Does the assignment ask students to include differentiation that will challenge gifted, talented, or high-ability/advanced students?
- Does the assignment reference gifted, talented, high-ability or advanced students?
- Does the assignment stress the importance of planning for students of all abilities?

Checklist for Assignments: Letter to Parents: Methods: High School Mathematics

- Does the assignment ask students to include differentiation that will challenge gifted, talented, or high-ability/advanced students?
- Does the assignment reference gifted, talented, high-ability or advanced students?
- Does the assignment stress the importance of planning for students of all abilities?

Checklist for Assignments: Pre-Calculus Lesson Plan: Methods: High School Mathematics

- Does the assignment ask students to include differentiation that will challenge gifted, talented, or high-ability/advanced students?
- Does the assignment reference gifted, talented, high-ability or advanced students?
- Does the assignment stress the importance of planning for students of all abilities?

Checklist for Assignments: Unit Plan: Methods: High School Mathematics

- Does the assignment ask students to include differentiation that will challenge gifted, talented, or high-ability/advanced students?
- Does the assignment reference gifted, talented, high-ability or advanced students?
- Does the assignment stress the importance of planning for students of all abilities?

Checklist for Assignments: Unit Plan: Methods: Middle School Mathematics

- Does the assignment ask students to include differentiation that will challenge gifted, talented, or high-ability/advanced students?
- Does the assignment reference gifted, talented, high-ability or advanced students?
- Does the assignment stress the importance of planning for students of all abilities?

Checklist for Assignments: Student Interest Survey: Secondary Classroom Management

- Does the assignment ask students to include differentiation that will challenge gifted, talented, or high-ability/advanced students?
- Does the assignment reference gifted, talented, high-ability or advanced students?
- Does the assignment stress the importance of planning for students of all abilities?

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