

Identifying, describing, and Developing Teachers Who Are Gifted and Talented

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Challenge or issue within science teacher education

Giftedness is not present only in childhood. It persists for a lifetime. However, even though most colleges/universities provide special needs services for appropriate students, most if not all faculty might not believe it necessary to provide any accommodations for gifted/talented students either at undergraduate or at the graduate level. In order to accommodate one or more gifted/talented students in a class, faculty need to rethink their pedagogy and assessment strategies. In courses for pre-service teachers, most courses include how to teach gifted and talented students in basic education settings for K-12 grades. At the college/university level in teacher education accommodations are usually absent because faculty do not perceive a need to do so in their courses. This presentation describes adaptations three professors made to their science methods classes in order to provide a challenge for all students but especially for the gifted/talented students in the class.

When designing syllabi, that models inclusive and varied interests and abilities of the students enrolled, one considers an assortment of assessment choices that meet the requirements of the curricula and that give all levels of students an opportunity to develop their products according to their interests, abilities and relevance to the students that they are planning to teach. A universal design for instruction is usually implemented to provide differentiation of instruction in each class. At the university level, students are completing or have completed degrees from accredited pK-12 schools followed by two years of content specific coursework at the college/university. They then arrive in their education courses with a fairly good set of skills and content. Thus, students with characteristics of giftedness is not always apparent during the first meeting of a course. The instructor considers differing ability levels when designing assessments and assessing material that students develop on an ongoing schedule during the course. From the first day of class, faculty may begin to identify gifted and talented (GATE) students during assessment of products and dialogue in the classroom. Faculty note that the gifted students in a college classroom are usually not afraid to take risks and to explore areas in which they feel they lack knowledge. They actively attack the material and show a level of interest beyond what the more conventional students show. This is as true on the undergraduate level as it is on the graduate level. It is in curriculum and assessment design that the needs of the students are considered. It is the job of the professor to provide the inspiration and direction of the products that is critical to meeting the needs of the GATE students.

Connection to the challenge or issue

Our experience indicates that project based learning results in the GATE adults in our classes to be motivated and to further develop personal interest in a topic related to public school curricula and their fields of expertise. Providing an opportunity for choosing their own topics generates an interest and a level of motivation beyond what is usually seen in these courses. Thus, such projects provide the time and the framework for differentiated education. The gifted can be challenged to learn advanced content, exercise higher process or thinking skills, and develop more complex products (Gallagher & Gallagher, 1994) and at the same time allow the regular student to complete the same task to the best of their ability and meet the state and accreditation standards.

An additional strategy used in the science methods courses involves use of inquiry methods of teaching. The information and products from this instruction allowed us to collect from which we wrote the case studies. This teaching practice was chosen in addition to project based learning because, few

professors express their visions, philosophies and strategies for finding and nurturing giftedness and making gifted learning blossom (Patricia 2001). Schillereff (2001) shared an inquiry process used in the elementary science classroom for gifted students in grades 3-5 during a professional development event. This process provided a guide for other teachers to reflect upon and perhaps use to help with the redesign of lessons for their classes. According to Schillereff the development of varied questioning skills is the first step towards self-directed inquiry. This skill aids the students' ability to create questions that focus on content, process, product, presentation, audience, and assessment.

Information to be presented and what the audience will learn

A number of case studies will be described which will show the depth and degree to which project based and case study teaching methods are successful in motivating, stimulating and generating topics of interest for our GATE students. The cross analysis of the case studies revealed that special opportunities for gifted students to work individually as well as collaboratively on topics was useful. These methods can be used in future classes to promote confidence in choosing and adapting or creating cases/projects on which they could base a motivating curriculum for their future students.

Justify contribution to the world of science education

All of the students that enroll in graduate and undergraduate teacher preparation programs have been successful in achieving the level of education prescribed by their career goals. The graduate students have all received baccalaureate degrees from accredited undergraduate institutions and the undergraduate students have reached the third year of their teacher preparation programs (a few begin their programs earlier). They are not typically able to accept that the educational practices that they have endured in their content major prior to taking teacher education courses may not constitute best teaching practice. We, as science educators, are challenged by these students because:

- We want to provide the best preparation for future teachers of future children.
- We understand and accept a need for accountability for ourselves as well as for our students.
- We want to make our courses challenging as well as useful.
- We want to model the type of teaching that has shown success with gifted children and adults.

Who would be interested in the presentation

Any science education faculty.

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