

## Talented Students in an Exemplary Career and Technical Education School: A Qualitative Inquiry

Marcia Gentry, Saiying Hu, Scott J. Peters and Mary Rizza Gifted Child Quarterly 2008 52: 183 DOI: 10.1177/0016986208319300

The online version of this article can be found at: http://gcq.sagepub.com/content/52/3/183

Published by: \$SAGE

http://www.sagepublications.com

On behalf of:

NATIONAL ASSOCIATION FOR

Gifted Children

National Association for Gifted Children

Additional services and information for Gifted Child Quarterly can be found at:

Email Alerts: http://gcq.sagepub.com/cgi/alerts

**Subscriptions:** http://gcq.sagepub.com/subscriptions

Reprints: http://www.sagepub.com/journalsReprints.nav

Permissions: http://www.sagepub.com/journalsPermissions.nav

Citations: http://gcq.sagepub.com/content/52/3/183.refs.html

Gifted Child Quarterly

Volume 52 Number 3 Summer 2008 183-198 © 2008 National Association for

http://gcq.sagepub.com

## Gifted Children 10.1177/0016986208319300 hosted at http://online.sagepub.com

## Talented Students in an Exemplary Career and **Technical Education School**

## **A Qualitative Inquiry**

Marcia Gentry Saiying Hu Scott J. Peters Purdue University, West Lafayette, Indiana Mary Rizza Ohio Department of Education, Columbus

Abstract: Outstanding talents exist in all areas of human endeavor, yet little information exists concerning gifted and talented students in career and technical education (CTE) settings. This qualitative study investigated an exemplary CTE center and the experiences of the rural secondary students who were identified as talented in this setting. Four themes emerged and paralleled suggested practices in gifted education: individualization, student-centered meaningful choices, instructors as developers of talent, and participation in career and technical student organizations. Results offer methods that secondary educators can use to recognize and identify talented CTE students and engage them in challenging, meaningful learning. Findings of positive experiences of talented students in this setting led to the conclusions that CTE programs should be included as part of the continuum of services for gifted and talented youth and that CTE programs should identify, recognize, and serve gifted and talented students.

Putting the Research to Use: With the current U.S. Department of Education's definition of gifted and talented including all areas of human endeavor, career and technical education areas need to be included among programming options for gifted and talented students. The results of this study indicate that not all students with gifts or talents have skills in the traditional academic areas. Some prefer applied content areas taught in hands-on, student-centered classrooms, such as those found in the career and technical education center described in this study. Teachers of traditional academic subjects can use this research to engage their students in meaningful learning by providing them with choices, encouraging their self-direction, and presenting content in a relevant manner. This study also reinforces the value that students place on teachers who care about and connect with them on personal levels.

**Keywords:** career and technical education; qualitative; secondary education; gifted; talented; underserved gifted; special programs; programming; service delivery

In this study, we extended previous research on an Lexemplary career and technical education (CTE) center and qualitatively investigated the experiences of students identified as talented in their area of CTE. We initially identified this center for study because it emerged as an anomaly in a national instrumentation study concerning secondary students' perceptions of their classroom experiences. Student perceptions concerning appeal, challenge, choice, meaningfulness, and self-efficacy at this center significantly exceeded those

of the other 7,000-plus students in the sample. Because of our interest in gifted education and the belief that gifted and talented students exist in CTE settings, we

Authors' Note: Address correspondence to Marcia Gentry, PhD, Associate Professor, Director, Gifted Education Resource Institute, Beering Hall, Room 5116, 100 North University Street, West Lafayette, IN 47907-2098; e-mail: mgentry@purdue.edu. Note: This article was accepted under the editorship of Paula Olszewski-Kubilius.

developed an identification procedure and sampled talented students to investigate their experiences. The lack of literature concerning gifted and talented students in CTE led us to wonder whether such education has been overlooked as an important service for such students.

## **Study Rationale**

Much has been written on gifted secondary students, and much has been written on vocational education, recently renamed CTE, but a review of the literature reveals a limited number of articles in the last 20 years combining the two topics (e.g., Dayton & Feldhusen, 1989; Greenan, 1998; Greenan, Wu, & Broering, 1995). The federal definition of gifted children states, "Outstanding talents are present in children and youth from all cultural groups, across all economic strata, and in all areas of human endeavor" (U.S. Department of Education, 1993, p. 3). It follows that talented youth are present in CTE settings and in areas of vocational study. Examining the nature, experiences, and needs of gifted and talented children enrolled in CTE programs may afford educators in CTE and gifted education new perspectives concerning gifted and talented students. Historical literature provides a rationale for inquiry.

## Gifted and Talented Students in CTE Are Overlooked

Career awareness for gifted students has not received sufficient attention, and some evidence exists that gifted and talented youth have been systematically counseled away from vocational education (Bachtold, 1978; Brenneman, Justice & Curtis, 1980; Ellis, 1976; Herr, 1976; Pulvino, Colangelo, & Zaffrann, 1976; Zaffrann & Colangelo, 1977). Phelps (1978) built a strong case for gifted and talented students' participating in vocational programs and described the problems faced by these students. He found that many gifted and talented students had been frustrated by school and that only one state had developed and disseminated guidelines for vocational education programs serving gifted and talented students. Talented students interested in CTE have been overlooked (Brann, 1988), and vocational educational services for the development and facilitation of gifted students' talents have not been implemented (Brann, 1988; Dembo, 1991). According to Greenan et al. (1995), many talented students receive limited vocational and technical education that integrates academic knowledge with technical skills and career exploration that could benefit gifted and talented students.

# CTE: Necessary Option for Gifted and Talented Students

Society values highly talented and creative craftspeople and technicians as much as it values individuals in other professions (Higbee & Taylor, 1990; Milne, 1982, 1990). Furthermore, talented students possess demonstrated or potential abilities in areas such as creativity, academics, leadership, and visual arts (Dembo, 1991; Feldhusen, Moon, & Rifner, 1989). When combined with four recognized strength areas of gifted and talented students-general intellectual ability, academic aptitude, creative/productive thinking, and leadership ability (Renzulli, 1978)—vocational education seems to be ideally suited to gifted students (Colson, 1982). For example, Dayton and Feldhusen (1989) believed that the exceptional talents that students showed in the vocational program areas—for example, creating with their hands, planning gourmet meals, designing clothing, constructing buildings, conducting business, and managing farms—were as important to society as were talents in traditional academic areas.

CTE has been frequently suggested as a necessary option for gifted and talented students (Buffer & Scott, 1986; Colson, Milburn, & Borman, 1983; Diehl, 1976; Khatena, 1977; Phillips, 1978). Furthermore, Greenan et al. (1995) found that in instances when CTE and talent development programs have worked together, such integration helped teachers develop creative teaching strategies, individualize instruction, and create differentiated curricula. However, others have identified issues associated with identifying gifted and talented students in CTE programs (Brenneman et al., 1980; Ciha, Harris, & Hoffman, 1974; Khatena, 1977; Malone, 1975). For example, virtually no mechanism exists to identify gifted and talented CTE students, because these students differ from traditionally academically gifted students. In addition, many educators do not believe that CTE is appropriate for gifted and talented students.

Whereas this literature is dated, CTE still represents a viable option for gifted and talented students, and talented students who exist in CTE settings may go unrecognized. This research addresses methods for identifying talented CTE students, the experiences of these students in their CTE program, and the possible connections between gifted and talented and CTE programs.

## **Purpose**

Through qualitative investigative tools, the perceptions and experiences of gifted and talented students

were examined in a CTE center that students attended daily for a half day. Talented students were first identified, then observed in classrooms, and interviewed about their experiences, and the school was studied holistically; that is, the methods, curriculum, experiences, and opportunities afforded these students were the focus of the research.

#### Method

## **Participants**

Sampling procedures: School. The teachers in the high school CTE center had been rated positively by their students on variables assessed by the Student Perceptions of Classroom Quality (Gentry & Owen, in press). This instrument assesses student attitudes toward their class experiences on five constructs appeal, challenge, choice, meaningfulness, and selfefficacy—using a 5-point Likert-type response scale (1 = strongly disagree, 5 = strongly agree). Because the 20 teachers in the school were ranked more than 0.50 standard deviations higher on all constructs than the other 300 teachers in a validity study of the instrument, the school was selected for in-depth qualitative study to help explain the significant quantitative differences (for further discussion, see Gentry, Rizza, Peters, & Hu, 2005).

Sampling procedures: Programs and talented students. Nine programs in the CTE center were selected for intensive study. Three of 20 programs have academic admission criteria for students and were purposively included for the purpose of investigating talented students in a CTE setting: certified network administrator, criminal justice, and information technologies (IT). Six other programs were selected randomly: auto-diesel technologies, business service technologies, early education, medical technologies, natural resources and agritechnologies (NRAT), and welding.

Teachers of selected programs identified students who were talented in their program areas (but not necessarily academically gifted) for purposive inclusion in the study, using the following indicators from the literature (Michigan Department of Education, 2001; U.S. Department of Education, 1993):

- Shows outstanding talent in this domain and career pathway when compared to age peers
- Performs or shows potential for performing at remarkably high levels of accomplishment when

- compared to others similar in age, experience, or environment
- Has desire to work with advanced concepts and materials in this area
- Is willing to explore new concepts
- Seeks alternative ideas
- Actively considers others' values
- Often thinks out of the box

Teachers then rated as many as four of their students on the indicators, using a 4-point scale  $(4 = to \ a \ great$ extent;  $1 = not \ at \ all$ ). Not all instructors chose to submit ratings for four students, though all submitted at least two ratings. The top two students (based on instructor ratings) from each of the nine programs composed the sample. Student scores on the rating scale ranged from 21 to 28 points. In response to questions concerning their student nominations and the talent levels of the students included, instructors indicated that these students had demonstrated talent beyond the other students in their areas of study. In all, the sample of 18 students from 375 students in the nine programs equaled 4.8% of the total number of students, a percentage common in practice when identifying gifted and talented students from a general population. Two of these 18 students were unavailable for interview and were thus not included in the data analysis.

Context of the participants. Gentry et al. (2005) described the context of this rural Midwestern CTE center serving students from member high schools, as well as students who pay tuition to attend. Most students who attended the center lived 3 to 12 miles from the center, but a few traveled as far as 25 miles to attend. In all, approximately 800 students choose to attend the center during their junior and senior years of high school. They are also required to attend their regular high school as a condition of attending the center.

Students who attend this center reflect the student population in the county on a variety of variables, including socioeconomic status, postsecondary attendance, percentage identified for special education services, and achievement levels. State data from the 2000 census reveal nearly identical graduation rates as those in the center (89% vs. 90%, respectively) and rates of children living in poverty (14% vs. 15%) yet lower averages for the center regarding median household income (\$38,760 vs. \$44,667) and percentage of people who hold bachelor's degrees (10.6% vs. 21.8%).

## **Design**

Qualitative research focuses on finding meaning through process rather than outcome (Creswell, 1998). Researchers use an open and emergent process to facilitate unfolding the data's story and addressing the question of *why*. According to Bogdan and Biklen (1998) qualitative researchers immerse themselves in the setting. In a naturalistic approach to data collection, the researcher is the primary instrument of data collection. By collecting information in a variety of ways, researchers can understand the entire context and provide a full and descriptive account of the situation.

Using a grounded theory approach (Strauss & Corbin, 1990) and the qualitative methods of interview, participant observation, and document review, we sought to understand and uncover the experiences of the talented students in this CTE setting. We focused on the experiences of the students who were identified as being talented in the setting; we wanted to inquire how their CTE experience compared with their general educational experiences to attempt to understand the nature, experiences, and needs of students who were talented in CTE areas. Two lead researchers participated in all phases of this study to strengthen the credibility of the findings by providing multiple perspectives and by facilitating analysis, discussion, and data checking. Furthermore, a research team with expertise in gifted education and research—including three professors, a visiting scholar, and five graduate students viewed and analyzed the data, thus helping to identify final selective codes and add credibility to the findings.

#### **Data Collection**

We gathered data through participant observation, interviews, and document review. As a method of understanding the cultural implications of the situation, participant observation provides a firsthand view of the behaviors, language, and transmission of norms, laws, and mores. Considered a participant, the researcher becomes a component of the situation. The purpose of the observations must be understood before data collection, and it may be descriptive, focused, or selective in scope (Spradley, 1980). During the study, initial observations were descriptive, looking broadly at the situation yet focusing on all activity with equal interest. As the study progressed, observations included more focus on instances based on suggestions by the participants. For example, we were invited to observe group interaction at rehearsals for competitions and to attend instructional activities that the faculty believed would

inform the study. These focused and selective observations added to the richness of the final descriptions, and they triangulated the data from other observations and participant interviews.

Following the guidelines of Rubin and Rubin (1995), interviews of the student participants followed a semistructured interview protocol that included questions about the school, staff, curriculum, and their designation as *talented* (see Appendix). Furthermore, we interviewed faculty, staff, and administrators using a similar protocol, thus adding adult perspectives regarding the environment and triangulating data from the students. After formal and individual interviews, participants were also consulted to triangulate data as needed.

In addition, we collected and reviewed documents, including school improvement plans, progress reports, student awards, and accreditation information to facilitate comparison and triangulation with observation and interview data. We collected data over the course of a high school semester by making multiple site visits to the CTE center. During these months, we made multiple observations of the nine programs, taking detailed field notes. All interviews were taped and transcribed, and field notes, logs, and documents were compiled to provide a holistic picture of the school.

The use of a research team in this study added credibility and believability by providing multiple perspectives, observations, and views in the qualitative data analyses. In this article, we report trends and exceptions in efforts to understand the school environment and the talented secondary students who participated in its programs.

## **Data Analysis**

Wolcott (1994) suggested building a descriptive account of the context by using analyses that involve a progressive focusing of the data. Accordingly, we coded data according to a three-step process, examining and synthesizing individual data points into broader, more descriptive themes (Strauss & Corbin, 1990). We first examined the data for open, or general, codes that describe discrete events. Open coding involves categorizing the data by investigating each discrete piece of information available and determining what it represents. For example, students were asked to describe their experiences in school, their reasons for selecting the career center, and their reactions to being designated as talented. Each experience became an open code because it describes a distinct situational element. Data at this level of coding include discussions of how teachers made a difference in the students' lives by

being encouraging, challenging, and strict but fair and by treating the students with respect. The students also talked about how the career center offered them opportunities and individualization not available at their home school, including independent study, self-pacing, and meaningful choices.

Next, we compared open codes across participants and situations to form axial codes that describe categories of behavior. Axial codes describe phenomena, including events, actions and reactions, ideas, and other subcategories described by the open codes, thus relating discrete pieces of information into a connective descriptive web. Strauss and Corbin (1990) described the causal condition as that which occurs between a subcategory and the phenomena with which it is associated. It is the action-reaction nature inherent in all phenomena, according to Strauss and Corbin, that exerts important influence on the axial coding. Questions that guide the coding process at this stage should center on identifying the actions that led to the phenomena being described, as well as the reactions and consequences of the actions and phenomena. For example, the data reveal that the students perceived opportunities for individualization and to make personally meaningful choices key to their satisfaction. They credited teachers as being integral to their individualization and their choices. However, the role of the teachers went beyond what they offered in the way of curricular choices, and it emerged as a separate axial code. Further analysis of the open codes revealed other axial codes—namely, instructors' assuming roles of talent developers in which they connected with their students using professional experiences, expert teaching skills, and the creation of an environment reflecting personal caring and high expectations. These axial codes were reviewed and compared to make wider connections of phenomena. The results yielded four final or selective codes. The final coding phase involved the reassembling of the data into a narrative discourse describing the factors influencing the participants and environment. We describe these data in terms of the truth they reveal, not how they fit into other established theories. We termed the final four themes or selective codes from these data: individualization with no ceiling, student-centered meaningful choices, instructors as developers of talent, and participation in career and technical student organizations (CTSOs).

#### Results

We use narrative to describe the students in the study and the four themes that emerged from the data analysis, each of which relates to the experiences of the vocationally talented students and how their individual needs were addressed at the CTE center.

## **Descriptive Student Results**

We interviewed 16 talented students from eight programs (although the business services instructor identified talented students, these students were unavailable for interview because of on-the-job-training placements). Most students (n = 14) had not been identified as *gifted* in their home school, although 11 reported that they had taken advanced classes in high school and several home schools did not identify gifted students. Several of the CTE students identified as being talented would have been considered average or below average in a general academic setting, but they excelled in the CTE setting. This was especially apparent in the early education, welding, and auto-diesel programs. Table 1 summarizes information about the students of this study who were identified as being talented.

### Theme 1: Individualization With No Ceiling

Individualization, a key component in gifted education, routinely existed at the CTE center for the talented students and other students. Instructors went to great lengths to create challenging and meaningful opportunities for students who were talented in their areas of study. The teachers did so in a variety of ways—for example, by offering students opportunities for individualization through independent study, mentorships and apprenticeships, and self-pacing via curriculum compacting and acceleration.

Independent study. Instructors routinely demonstrated a willingness to acknowledge strengths and make exceptions. As one student put it, "here they look for what I do well. At my home school, they look for what I do wrong." Instructors focused on enhancing student strengths; that is, in this professional environment, when a student already knew something or could already do something, instructors made accommodations. Mr. W, the IT instructor, described the essence of this theme:

I had a student, 4.0, very articulate, very gifted, and had some problems with his attitude. . . . I became frustrated and pulled him out of class and talked to him about how I could serve him better. He said his problem was that he had to wait for other students to get done and he had nothing to do. I asked administration if I could buy him one station of Network Plus (that's \$4,000) so he could go at his own pace and study independently. That way, he could go as fast as he wanted. He told me at the end of the year, he couldn't believe a teacher would do this

## Table 1 Gifted Career and Technical Education (CTE) Students' Demographics

Student: Ken, M, junior Program: Auto-diesel

Gifted: No Adv courses: Math

Student: Jake, M, junior Program: Auto-diesel Gifted: No

Adv courses: Math

Student: Will, M, senior Program: CNA
Gifted: No

Adv courses: Honors physics, AP classes, calculus

Student: Jon, M, senior Program: CNA Gifted: Yes

Adv courses: Math, science

Student: Fred, M, senior Program: Criminal justice

Gifted: No

Adv courses: Honors English, honors world history

Student: Kristy, F, junior Program: Criminal justice Gifted: No Adv courses: American literature

Student: Jenna, F, senior Program: EE Gifted: No

Adv courses: Honors algebra II

Student: Jaimie, F, senior Program: EE Gifted: No

Adv courses: None

Student: Tina, F, senior Program: IT Gifted: No

Adv courses: Advanced computers,
Spanish V<sup>a</sup>

Ken loves diesel repair and wants to obtain a high-performance mechanics degree. He is also interested in drag racing.

He explained that the CTE center accommodated his advanced learning needs by offering the CTSO, projects that required open-ended problem solving, and the opportunity for him to work at his own pace and by treating him like an adult.

Jake is an auto mechanic, and he plans to attend a Northwestern auto-diesel program.

The CTE center accommodated his advanced learning needs by offering him additional jobs and skills to work on when the regular curriculum was mastered, by allowing him to work on his personal vehicle when skills were demonstrated, and by treating him like an adult.

Will is involved in band, computer repair, and competitions in CNA. He plans a career in computer sciences. Will explained that his needs are met at the CTE center through the CTSO programs, by being allowed to work at his own advanced pace.

He won national recognition in Business Professionals of America in computer repair, and he has been allowed to work independently on special programs and repairs that he identified. He had to take calculus on the Internet because taking it at his high school would have conflicted with his CTE schedule.

Jon has been accepted at to a state university's computer science engineering program, which he will attend upon graduation, and he is good at anything having to do with computers.

His learning needs have been met through options offered to him at the center and the ability to self-pace. He has been involved in IT and CNA, taking both certification tests. He especially enjoys the hands-on nature at the CTE center and the professional flexibility it affords.

Fred has been interested in law enforcement since he was 14 years old. He plans to earn a bachelor's degree in criminal justice and become a police officer.

He credits the center with helping him advance rapidly through the content via choice of placements and in areas of concentration. He enjoys the study of difficult theories with in-depth content. He noted that he found discrepancies between the content at the center and that in his high school government class.

Kristy studies canine law enforcement and plans to be a K-9 police officer. She discussed the choice of projects and placement in criminal justice as factors that worked for her.

She also reported that the instructors challenged her strengths while addressing her weak areas. She was selected as one of three seniors from the county to participate in the state summer institute for gifted students—her course of study will be about crime and law.

Jenna wants to go to college and become an elementary teacher. She has been dually enrolled in college and will have 15 college credits upon graduation from high school.

She was selected as the EE student of the year. She credits choice of placements and being pushed to set and attain her goals as meeting her advanced learning needs.

Jaimie plans to go to college to become a teacher. She plans a triple minor, including one in special education.

Jamie explained that the center met her advanced learning needs by placing her in a challenging work experience program with a variety of different teachers, by certifying her in CPR, and by having her placed in the classroom 4 days a week.

Tina has been accepted at a university and will major in computer science. She found that being able to work at her own pace helped meet her academic needs.

She uses her information technology in her part-time job, and she fixes computers at her job, even though her position is data entry.

(continued)

#### Table 1 (continued)

Student: Rory, M, junior

Program: IT Gifted: No

Adv courses: AP government,

Chemistry IIb

Student: Nancy, F, senior Program: Med tech

Gifted: No

Adv courses: Precalculus,

physiology

Student: Alice, F, junior Program: Med tech

Gifted: No

Adv courses: National Honor Society, chemistry, advanced math, American

literature

Student: Bruce, M, senior

Program: Weld Gifted: No

Adv courses: None

Student: Sam, M, junior

Program: Weld Gifted: No Adv courses: None

Student: Ron, M, junior

Program: NRAT Gifted: Yes

Adv courses: Environmental studies program,

agri-wilderness expedition<sup>c</sup>

Student: Amber, F, junior Program: NRAT

Gifted: No

Adv courses: Honors

chemistry, AP calculus

Rory is not sure of his career path but is confident that computers will be a part of it. He explained that the CTE center met his advanced learning needs by offering him the opportunity for involvement in CTSOs and competitions.

He is hoping to pass the A+ certification test and has enjoyed the freedom to work at his own style and pace, as well as with students and instructors in the CNA program.

Nancy began at the center in the teaching program but did not like it, so she transferred to medical technologies. She found that she loves the medical field and plans to become an registered nurse.

Her advanced learning needs were met through acceleration. She was encouraged to complete the Year 1 curriculum while entering Year 2 and did so within a couple of months of beginning the program.

Alice loves science and wants to learn about psychology, special education, autism, and occupational therapy. She is interested in the connection between medicine and kids.

She found that the center met her advanced learning needs by offering CTSOs for her participation. She also discussed how her instructor used a learning style assessment to help the students better understand how they learn.

She found that the use of self-pacing, the use of a college-level text, and the ability to earn college credits very motivating. She commented that her teacher pushed her to do her best and encouraged her participation in leadership roles in the CTSO and the classroom.

Bruce enjoys making things, and he wants to work in his uncle's shop as a welder and maybe go to college. He loves the choice of projects and the ability to work at his own pace. He explained how his instructor challenges him to continually improve and to learn new skills.

He is involved in a CTSO, where he placed in local and regional welding competitions.

Sam, an English-language learner, wants to learn to weld, get a good job, and go to college. He explained that welding comes easy for him.

His instructor shows him how to do things and has high expectations for his students. Sam explained that he is offered a choice of projects and can work at his own pace.

Ron has a variety of interests in the environment, politics, sports, and leadership. He wants to attend college, play sports, run for state office, retire, and work on his farm.

He holds three state titles in his CTSO, and he explained that it helped meet his advanced learning needs. He also said that competitions, caring instructors, options in the program, and choices in projects and areas of study added to his successful learning the CTE center.

Amber plans to major in forensics and animal sciences in college and, after graduation, farm and breed pigs for show.

She explained that involvement in CTSOs, choice of specialty areas, and the challenging content meant that she was learning all the time in the NRAT program.

Note: Pseudonyms are used for all students. AP = advanced placement; CNA = certified network administrator; CTSO = career and technical student organizations; EE = early education; IT = information technologies; NRAT = natural resources and agri-technologies; a. There are no honors or AP courses at her home high school.

- b. Rory has taken advanced classes and some classes early.
- c. Advanced science wilderness program that occurs yearly in the summer.

for him. He was from our local schools and had problems because they would hold him back or make him wait or because the challenge wasn't enough. He was my best student after he found that I wasn't against him, that I wanted him to do the best and learn as much as possible.... We need to make special accommodations for gifted as well as special education. I have one [learning disabled] student and another dyslexic student who we accommodate for and who are both very solid students.

Jake, from auto-diesel, explained, "[Another student] and I get most of our jobs done, and [the instructors] don't have to push us, and they add more. When we get close to being done, they add more." Students rarely, if ever, complained of being bored or not being allowed to continue on to more difficult material when they finished an assignment or task. Staff at the center worked to provide opportunities that would allow their students to make continual progress, even if it meant finding additional equipment or materials to keep the student challenged.

Mentorships and apprenticeships. The nature of CTE includes opportunities to explore a career, work with a mentor, and serve as an apprentice. All the talented students remarked about the importance of these authentic forms of learning in their academic progress. Kristy, in criminal justice, attended the center and expressed interest in becoming a canine police officer: "I like how they don't just stick with just one job. It's not just police officers-it's lawyers, dealing with foster kids, and gives you a lot of opportunities. . . . That's awesome how you get to look at other careers like that." Because some programs have a wider future career focus than others, special accommodations were made to focus on student interests. Nancy had been enrolled in the elementary teaching program and found that she really did not like it. Ms. C, from medical technologies, took her into the program as a senior and worked with her to catch up while inspiring her to choose a career as a registered nurse. She arranged for intensive field placements to help Nancy experience what she had missed in her junior year. In this case, the program instructor (herself a registered nurse) did not view Nancy as a student who was a year behind; rather, this instructor accelerated Nancy in advanced study of her career interest.

By design, some programs served as apprentice-type learning. Not only did the welding and auto-diesel instructors run their programs as if they were a shop, but they also owned or worked in a shop in the field. Mr. F, from auto-diesel, described his personal strategy: "I try to teach the program like [students] were employees in a shop with a boss. I don't treat them any different here than they would find it in the real world on the job." The students in criminal justice rotated through several authentic field experiences. Fred explained the process:

Second year, you are here 2 days a week for your college classes, . . . and the rest of the time it [is] used to do ride-alongs. . . . Right now I'm with the . . . police department; before I was with the jail, and then I was at the sheriff's department.

In welding, Mr. L mentored his students:

I'll do it with them, demonstrate for them, I'll watch them weld; I'll actually grab their hands and guide the welding gun while they are welding if necessary to get them to do it at the proper speed—to show they are doing it right or wrong.

Even in a class of 20 students, the instructor adapted his instruction to individuals. The early education program was perhaps the most field experience–extensive program, "I think a big appeal is that [the students] get to go out 4 days a week" (Mr. B). Very little of this program involves lecture or book learning; rather, the majority of the program occurs in the field, working with professionals in a business context. As Will from IT described it, "this has always been a place where you have a lot of freedom. With the training and opportunities given, certifications that are recognized in industry, it is a very real world."

Self-pacing, curriculum compacting, and acceleration. All the talented students acknowledged freedom in their programs to work at their own pace and ahead of other students. The instructors also acknowledged this aspect of their programs. The medical technologies instructor helped a talented senior who came into the program as a first-year student catch up to the second-year students by assessing her knowledge and skills and offering her an accelerated and compacted program, thereby allowing her to move through what was traditionally 2 years of content in a single year. Mr. W and Mr. B both described adjusting content for students with learning disabilities and for talented students. This type of individualization seemed to flow naturally in the CTE center programs. Instead of "getting done," students continued to progress in their studies by doing new and different things as they mastered the skills and curriculum. This type of individualization was not viewed as a major accomodation; rather, it was quite commonplace at the CTE center. Talented students appreciated these opportunities and took advantage of them.

The early education instructor, Mr. B, went so far with his self-pacing that he allowed some students to finish the program in half the time:

I have a few students do the 2-year curriculum in one year. One was a senior; the other one wanted to take more classes and get into teacher training. They must do five projects or tests as a minimum and [are] encouraged to do more if capable because we do it at our own pace.

Students were often given a list of assignments or projects for the year and allowed to do them in whatever order they wanted.

They don't have to do the projects in order. They can decide when they want to do them. One day they may want to work on the brake, another a timing belt. We have the curriculum, but they can jump around. (Mr. H, auto-diesel paraprofessional)

The students commented on this policy as well: "I like to work at my own pace; I don't like to be pressured because it's really hard for me to get stuff done. . . . [The instructor] will let you work at your own pace as long as you get it done" (Amber, NRAT).

## Theme 2: Student-Centered Meaningful Choices

The CTE center offered students many choices and in doing so seemed to help students learn to make choices that addressed their individual needs. Examples of these choices, as described by the talented students, included the ability to have dual enrollment in CTE courses and college, earn college credit, obtain certifications, choose their field placements, and become involved in areas of focused and advanced study.

Dual enrollment and college credits. Of the 16 talented students, 8 chose to enroll in college courses. In addition, all had firm plans for their postsecondary lives, as noted in Table 1. The students who enrolled in college described how important they believed this option was and how they valued being ahead of their peers with respect to college credits. Jenna from early education described her future plans and how the center put her ahead:

I'm in dual enrollment in college classes, and by completing this course, I get six credit hours at [the local community college], so I'll have 15 before I go back to school and plan to go to [the community college] full-time.

Criminal justice offered similar credit, as Fred explained: "You are here 2 days a week for your college classes. . . . You can earn up to nine college credits . . . which can be very beneficial." In medical technologies, the students received credit for successfully completing classwork for the program: "Anatomy and terminology both articulate to [a local college], so if a student is going to go there, they would have credits already from having successfully passed them here" (Ms. C). The

students viewed college credit as not only a connection to something larger than the center but also as a source of motivation to succeed.

Certification. Some programs offered certification for students. The IT students commented on working towards A+ certification: "[Our instructor] lets you know you're here for a reason—for your A+ certification—you don't want to waste it" (Rory). In a similar fashion, the CNA students worked to be certified as well: "It's learning Novell networking . . . at the end of the year you take an exam and get certification for it. It transfers credit to a lot of colleges" (Jon). Both the medical technologies and early education programs certified their students in CPR, and students in the auto-diesel program could obtain several area-specific certifications, such as brakes. Alice from medical technologies explained, "we also get CPR certified for the program and state certified. . . . That's kind of a plus." In the end, all but one program offered some type of field-recognized certification. Not only did these certifications give the students some concrete connection to the field, but they served as a specific goal and a source of motivation. Most of these tests and certifications have fees; however, the CTE center paid the costs for its students.

Areas of focused and advanced study. As shown in Table 1, students who were identified as being talented in their programs expressed plans for their future. Some had already been accepted to postsecondary schools, whereas others had plans to enter the workplace. In either case, these students would enter their new schools or places of employment with advanced skills that would put them ahead of their peers. For example, auto-diesel students would enter their fields having worked on customer vehicles while receiving field specific certification. Both talented students from CNA commented on freedom to self-pace curriculum and to do independent study in advanced areas of interest. By being allowed such freedom for exploration, these students possess advanced knowledge and experience unavailable to most beginners in their field. The early education program placed students up to 4 days a workweek in educational settings such as classrooms, preschools, and licensed day care facilities, thus providing them with extensive practical experiences. NRAT provided a diverse and advanced range of areas of individual student study, as Amber explained:

Not everyone does the same thing. We . . . specialize in different areas—like some kids do taxidermy; some kids who don't want to do that do the greenhouse area

or the lamb lab area with all the animals . . . Some people . . . like horticulture so we have a tree lot where they learn trees and plant other trees and maintain wildlife grounds.

Such specialization facilitated in-depth study in focused career interest areas, offered students control and freedom in their program, and helped contribute to the individualization these talented students valued.

## Theme 3: Instructor as a Developer of Talent

The instructors at the CTE center had profound influences on these talented students. Instructors were competent and caring and had not only professional experience but also expert teaching skills. They demonstrated the capacity and desire to address a range of abilities in their programs, and in doing so, they held high expectations, offered challenges, and provided students with encouragement to develop and achieve individual goals. These expectations varied on the basis of students' abilities and skills yet remained high, being adequately matched with the students in the programs.

Competent, caring instructors with professional experience and expert teaching skills. As described in previous work (see Gentry et al., 2005), the instructors at the CTE center had professional experience in their field that enhanced their credibility with the students. The talented students in this study appreciated their instructors' experiences. Alice explained: "I find teachers aren't really scientists; they just have background and went to college to teach that. Mrs. C is a nurse. I look forward to coming every day to learn from her experiences." Fred said of his instructors in criminal justice,

These guys have been on the road, and they're both still working part-time [in law enforcement] and have experience and keep up-to-date and are knowledgeable. You can have book-taught people teaching, but it's not the same as with those who have done it and have real experience. They can give you advice and save you from errors.

When asked about his instructor, Jake from autodiesel explained, "They tell you their life experience from what they had when they started and it helps with experience they can tell you easier ways to approach jobs."

Furthermore, staff at the CTE center had extensive backgrounds in educational pedagogy. All instructors held teaching certificates, except one who was in the process of obtaining his degree in education. Eight held master's degrees in education or their specialty fields. The climate at the center included a desire by staff to effectively reach and instruct students. Paraprofessionals in each program actively participated in the teaching and learning processes, and they did so in such an effective manner that many students referred to the paraprofessionals as teachers. Criminal justice had one instructor and one paraprofessional for about 20 students. As Fred put it, "that's a good ratio, so they are always walking around—and available to help. . . . It's a lot easier than one math teacher for 35 students." Kristy from criminal justice also saw value in the background of her instructor and paraprofessional: "[Our instructor] really gives us what we need. He doesn't hide stuff from us and really tells us how it is. . . . [Our paraprofessional] has a lot of background also."

Teachers used a variety of instructional strategies, including simulations, quizzes, discussion, group work, instruction, and practice. Most integrated technology through the use of PowerPoint presentations, SMART Board technology, content review using a computer game, and student-led technology demonstrations. Each day, active, hands-on student involvement was observed, and students commented on the value of doing learning rather than reading about it. Rory said,

We're not sitting in class writing papers; we're working hands-on with computers. My brother says he's in a college class, where they sit in class and write about computers and not work on them, and it's the most boring thing he's ever done.

Tina commented, "[The teacher] gives us a lot of hands-on things—he has tried to figure out the computer—troubleshooting. It's more like a job training and preparing you for the field."

Half the talented students indicated that the teachers were the greatest strength of the CTE center. Fred, from criminal justice, explained,

The instructors, and I'm not just saying this, are really good guys. I have tremendous respect for them. If you don't understand something, you can sit down with them, one-on-one, and they care and will explain it so that you can understand it.

#### Will, from CNA, described Ms. H:

Ms. H. is nice and keeps us on task. Naturally, we can talk in class, so that makes things fun. You can tell she's a parent; she'll talk to us about anything. She lets us work around things. I missed a lot of class

because of nationals, so she gave me plenty of time to make up the work. . . . She lets me try experiments in areas . . . If it doesn't totally work out, that's okay. I used to be a bad perfectionist.

Ron described how teachers have affected his life

Mr. E is a very passionate person—he's very loving, open, and caring. A lot of times, he'll start off class with a little motivational—to make you think or ponder that—what's really the meaning of life—things like that. . . . Mr. P—his wisdom is just beyond me. I just love to listen to him talk—his voice and the way he communicates and puts in little subtle hints and meaning of life. It's just awesome how he does that.

#### Jenna described her instructor:

He knows exactly how kids work—he's really great! He will give you projects, and it's all hands on. He'll let you do what you want to do—he'll let you be creative—he doesn't expect everything to be perfect—like, little kids aren't perfect.

## According to Tina,

the teachers at the center are more like friends, and you can talk to them. It is a lot more personal than my home school. Mr. W is pretty strict—not a mother figure like Ms. H. Mr. W doesn't let you mess around and makes the classwork serious. This isn't a bad thing. I like having someone who doesn't let you screw around.

Rory reinforced Tina's perception: "As long as he knows you're getting your work done, he's a real buddy, basically. We don't horse around much at all. He knows that computers are very nerve-wracking and stressful things."

Ability and desire to address a range of students with varying abilities and talents. Teachers recognized differences among individual students; therefore, it was commonplace to observe differentiation across the ability range of the students. According to Alice,

We've been doing anatomy and physiology using the actual book they use in college; it is very challenging. If Ms. C knows you can do well, she pushes you harder and expects more from you than from others. Yet, she has books on tape to help those who learn slower get it. She'll do anything to help students be successful. It puts a smile on my face and makes me

want to be more encouraging to people around me because she tells me she thinks highly of me.

Mr. B the early education instructor described how his students ranged in ability, from those who would probably own a business or teach early childhood at a college to those who had limited abilities but were working on skills that would enable them to work at a day care center as a teachers' aide. Clearly, he had different but realistic expectations for students from these extreme ends of the spectrum, and rather than compare them, he focused on preparing them in a manner that afforded growth and competence for the path that each had selected. Mr. L, from welding, also mentioned a disparity in student abilities: "For the most part, I'd say 70% of my students will eventually be good. . . . Another 30% will probably—I wonder if they will ever be able to hold down a really good fulltime job." Almost every program had low-functioning students, as well as those who were described as being exceptionally talented despite shortcomings in traditional academic areas.

In NRAT, Ashley specialized in animal husbandry but described classmates who pursued crops, taxidermy, and horticulture. Different students of differing abilities doing different things was common at the CTE center and seemed to facilitate individualized learning.

High expectations, challenge, and encouragement to develop and achieve goals. Instructors continually challenged students, and they focused on individual strengths, interests, and talent areas, as suggested by scholars from the field of gifted education. For example, in auto-diesel, Jake described how he was given additional tasks and encouraged to excel: "The teachers challenge us by adding more jobs, then encouraging us. They teach us more like adults here, not like home high school. When we understand it, we move on with more jobs that make us think." In NRAT, it seemed to be the simple lack of standardization in their instructor that was so appealing. Amber explained, "Mr. E always comes up with different activities—and he's [more] kind and unorthodox than most teachers. He can get down to the level with other kids. . . . He inspires us to learn. There aren't many teachers like that."

Finally, instructors and staff deliberately encouraged students to develop and achieve goals. All talented students in this study explained how their instructors counseled them about their career interests and professional possibilities in these interest areas, thus helping them plan for their future. For

example, Mr. L, from welding, begins his program by asking the students what they want to have: "One day a year, I go up to the chalkboard and ask them what kind of car [they] want to drive, how much it costs, its related expenses—and it is an eye-opener for students." He then shows them how they can get there through hard work and education: "[They] either get a trade or go to college, do both, but the bottom line is that making \$6 an hour is not going to buy much." Every program has a future profession in sight for the students, and the instructors are dedicated to helping students set and reach career goals.

## Theme 4: Participation in CTSOs

Participation in CTSOs emerged as another key to talented students' experience at the CTE center. These CTSOs are professional organizations for youth who plan to enter the profession, and they include the Future Farmers of America (FFA), Health Occupations Students of America, Business Professionals of America, and Skills USA. Each CTSO elects officers; holds regional, state, and national competitions in the field; and recognizes and promotes excellence among its young professional student members. Half of the 16 talented students reported intense involvement with the CTSOs. Students described the value of the competition, the leadership, the camaraderie, the recognition, and the ability to work with others who have common interests and abilities as reasons for the influence of the CTSOs on their professional and personal growth. As Ron from NRAT put it,

the really huge thing for me is the youth clubs—FFA—how much the youth clubs are a part of the experience here. The development you get from involvement in something like FFA is incredible . . . community leadership, career success, and personal growth. Those have been huge to me.

Competition. For some of these talented students, competing against other students from around the state and country in their talent areas proved important to the development of their own skills and talents. Ron from NRAT described the competition: "I was on the winning ag sales team in the state, where we developed a product and marketed it to a retailer. We sold dried cherries . . . dried Spartan cherries to foreign stadiums—it was pretty awesome." The welding program in general is extremely competitive, "All of my students are in Skills USA, and it's a requirement" (Mr. L). Even the instructor would compete with his students, challenging them to be better than he was:

I think . . . you need to be competitive with yourself, but competition with other people increases your skill level, and so I get students started to where they can do the basics, and then I'll run competitions, or I'll compete with the students to see if they can do better than I can on a particular weld.

Competition was used as a source of constructive feedback to encourage continual improvement.

Leadership. Four of the talented students held offices in their youth clubs, which helped them to develop leadership skills. Will, from CNA, even held leadership positions in more than one program:

I was class president last year for IT for Skills USA. I was the reporter for IT this year even though I'm a student in CNA class, and [the Business Professionals of America's] reporter moved away, so I took on that role too. . . . It's something extra to do that's fun, meet a lot of new people.

Camaraderie. With their skills competition, these organizations function like sports teams in the CTE areas. Students worked with and competed against others who shared their interests and abilities. Ron, from NRAT, described his team experience: "We developed a winning team and marketed it to a business or retailer—our team . . . won state in that, and then we had a second team that got third." Ms. B, a secretary, commented on the involvement of teachers in the extracurriculars: "Frequently, these teachers and their paraprofessionals will spend 4 days a week, sometimes away from their family, activities—no extra pay. . . . They all do it with enthusiasm and are incredible that way." The center's principal commented on how he would personally set time aside to help students prepare for their CTSO competitions, "with their interviewing skills or in speech preparation." The adults at the center made every effort to help the students succeed in their CTSOs. The center's custodian commented on the close relationships among students and staff, "Well, it is kind of like a family. . . . You have your youth clubs and events—the kids are supportive of each other—they really are. . . . You see the teachers here are very caring, and it's not just with their own students—it's with all students."

Recognition. At this CTE center, recognizing students' accomplishments in youth clubs occurred frequently and in different formats, such as newsletters, announcements schoolwide and in class, articles in the local paper, and formal awards banquets held at

the center in the evening. Winning plaques and trophies are prominently displayed. This small rural CTE center routinely wins over larger wealthier centers in the state and in the nation, and its students and instructors are proud of it. There is more than 80% participation in the youth clubs at the center, with 100% participation in several programs. Each program has an evening banquet honoring its CTSO participants, and the center holds a yearly schoolwide celebration of accomplishments for students involved in these organizations and competitions.

### **Discussion**

The data in the narrative tell a story, the experiences of students who were identified as *talented* in a CTE setting. The students described having their educational and personal needs met in the high-quality CTE programs they attended. These data can serve as the foundation for future research that integrates gifted and talented students with CTE. The narrative also provides information to those interested in effective methods for educating gifted and talented secondary students and to those interested in students with talents in nontraditional and nonacademic areas.

# New Knowledge: Gifted and Talented and CTE

Knowledge gained by studying talented students who chose to attend an exemplary CTE center adds to the scant literature concerning gifted and talented students and CTE. Gifted individuals exist in all areas of human endeavor, yet they have been overlooked in the realm of CTE by researchers in gifted and CTE fields. Recent work by Plank (2002) found that students who took academic and CTE courses were less likely to drop out of school; as such, it is possible that casting a wider net into CTE by gifted education researchers and educators may facilitate the recognition and development of talent among students who would not typically be recognized as gifted or talented in a general education setting. Furthermore, as schools attempt to demonstrate accountability to external assessments as required by No Child Left Behind, curricular choices have become narrow, thereby placing students at risk who may require nontraditional services such as CTE to meet their learning needs (Amrein & Berliner, 2002; Gentry, 2006; Laitsch, 2005). Visual and spatial learners may risk failure in traditional high school settings (Gohm, Humphreys, & Yao, 1998; Shea, Lubinski, & Benbow, 2001); yet, they may thrive in a CTE setting, and they

may even be recognized as being talented if given the opportunity for such programming.

Of the 16 talented students in this study, only 2 had been identified as being gifted in a traditional academic setting, and several would have been considered average or below average by teachers in their high schools—yet, all excelled in their CTE programs. This finding reinforces the need for a continuum of services for secondary gifted and talented students that includes CTE as one component. It also reinforces the need for multiple views of giftedness and methods for identifying and nurturing the development of nonacademic talents in students. Previous researchers have found that gifted and talented students often exhibit talent in specific areas (Dayton & Feldhusen, 1989; Dembo, 1991; Feldhusen et al., 1989; Higbee & Taylor, 1990; Milne, 1982, 1990; Renzulli, 1978) and that CTE is a necessary and ideal option for some gifted students (Colson, 1982; Khatena, 1977).

The notion of broadening the definition of giftedness is not new (e.g., Gardner, 1983; Marland, 1972; Renzulli, 1978; Sternberg, 1985; U.S. Department of Education, 1993); however, the practice of identifying more students in more domains has been slow to take hold in the schools. Many schools with gifted programs employ achievement and ability tests to identify gifted students, and in doing so they identify students who generally excel in school. Yet, the range of human potential in various domains is much larger than a measure of general giftedness. Many students in this study would not be recognized as gifted or talented by traditional means of identification, despite their ability and talent in their areas of study. Some students who were identified as being talented in this study were also recognized as being gifted, but the majority were not. Therefore, based on our findings, our suggestion is that nontraditional talent exists in CTE settings that would likely go unrecognized in traditional high schools, and we propose that personnel from high schools and CTE centers consider the notion of domain-specific talent when placing students in courses and programs; furthermore, we recommend the recognition of CTE programs as a viable placement for talented students and an appropriate environment for the development of student talents.

This study provides an empirical investigation and account of the experiences of talented students who are attending a CTE center. Previous researchers found that gifted and talented students had been systematically counseled away from CTE programs (citations). However, we found positive perceptions of CTE as a viable setting for gifted students (Bachtold, 1978; Ellis, 1976; Herr, 1976; Phelps, 1978; Pulvino et al.,

1976; Zaffrann & Colangelo, 1977). This might reflect newer attitudes toward CTE or the fact that the CTE center we studied was exemplary. More research is needed given that integrating academic and occupational learning has become a core principle of school-to-work and CTE reforms (Carl Perkins Amendments of 1998; School-to-Work Opportunities Act of 1994) and that gifted and talented students are affected by these reforms.

### **Parallel and Reinforcing Themes**

The talented students in our study found their CTE educational experiences valuable and meaningful. Four themes emerged—namely, individualization with no ceiling, student-centered meaningful choices, instructor as developer of talent, participation in CTSOs—and they paralleled themes found in the gifted education literature (e.g., Hébert & Kelly, 2006; Patrick, Gentry, & Owen, 2006; Roberts, 2006) and extended the themes of professionalism, sense of community, and reason to learn, as identified in previous research (Gentry et al., 2005).

Talented students at the CTE center were routinely afforded the following modifications, as recommended in the gifted education literature: mentorships (Mann, 2005); acceleration (Colangelo, Assouline, & Gross, 2004); curriculum compacting (Renzulli & Reis, 1997); independent study (Troxclair, 2000); teaching according to gifted students' personality preferences (Sak, 2004); and a self-directed project or program, self-pacing, dual enrollment, and multiage classrooms (Landrum, Callahan, & Shaklee, 2001; Ysseldyke, Tardrew, Betts, Thill, & Hannigan, 2004). These students enjoyed choices, freedom, individualization, and professionalism in their self-directed and self-paced learning experiences. They found their learning experiences relevant and meaningful, and they encountered no ceiling; as such, they were able to make rapid progress and learn content in great depth. Recommendations for this type of learning characterize the gifted education literature, so it appears that at least at this center, strong parallels exist between CTE and gifted education. Yet, the two fields have not connected, perhaps because in part of a narrow definition of giftedness and the perception that gifted and talented students should not attend CTE programs. In 1995, Greenan et al. suggested that integrating talent development programs with CTE could help teachers to develop creative teaching strategies, individualize instruction, and create differentiated curricula. Given our findings, we believe that those researchers are right.

Instructors played a significant role in talented CTE students' learning and development. These students

valued the professional experiences of their instructors, as well as their instructors' teaching abilities. The teachers at the center historically stay for life, which might explain their skills and the relationships that they developed with their students.

#### Limitations

This study is bound by limitations that must be considered when interpreting the results. Data are derived from only one site, the 16 talented students, and the faculty and staff at this site. Unlike quantitative research, where generalizability and internal validity are standard concerns, qualitative researchers focus on transferability and credibility (Lincoln & Guba, 1985). Credibility addresses the issue of whether the findings make sense. Miles and Huberman (1995) asked, "Are [the findings] credible to the people we study and to our readers? Do we have an authentic portrait of what we were looking at?" (p. 278). Credibility of this study was enhanced by fully describing the results, spending adequate time in the field, using a research team, triangulating data methods and sources, and using member checking and peer debriefing. One limitation that we acknowledge involves the limited prior research in identifying students with gifts or talents in CTE areas. As described earlier, our method identified students as talented and thus eligible for participation in our inquiry, and whereas we believe that we adequately identified these students, we acknowledge that more research is needed concerning the efficacy of this method. In fact, more research is needed in general concerning gifted and talented students and CTE.

#### **Summary**

This CTE center offered students the following relevant real-world learning experiences in the context of their interest and talent areas; professional, competent, and caring instructors who influenced student learning, belonging, and goal setting; and the ability and encouragement to work without a ceiling in their area of study. The students responded by engaging in their work, by connecting with their teachers and peers, and by making plans for their futures. It seems that other secondary educators might consider offering similar experiences and options to their students and thus generating similar outcomes.

## Appendix Interview Protocol of Study

1. How did you choose the career and technical education (CTE) center as a school?

- 2. What do I need to know about the CTE center?
- 3. Describe your program at the CTE center.
- 4. Describe yourself as a student, your learning style, your preferences for learning.
- 5. Is your program appealing to you? Do you find it interesting and enjoyable? In what ways?
- 6. Does this program/teacher challenge you? In what ways? Examples?
- 7. Are you offered choices in your program? Explain.
- 8. Do you find the program meaningful? Explain.
- 9. How does your teacher help you develop confidence to complete the tasks in the program? Examples?
- 10. What do you want to do after high school? How does the CTE center fit into this plan?
- 11. What are the greatest strengths of your program, your teacher?
- 12. What suggestions do you have to improve programs for students at the CTE center?
- 13. Do you have any other comments you'd like to add?
- 14. What kinds of classes do you take at your home school?
- 15. How does that program compare to the CTE center?
- 16. What do you see as your strength area? What are you good at here in school?
- 17. You are part of this project because your teacher here at the CTE center identified you as *talented* in this area. What do you think of that? Do you receive any accommodations here at the CTE center due to your talent in this area, different services, and so on?
- 18. Does your district/school identify gifted students? Do you know what programs they have?
- 19. Were you identified or did you participate in the gifted program?

## References

- Amrein, A. L., & Berliner, D. C. (2002). An analysis of some unintended and negative consequences of high-stakes testing (No. 0211-125-EPRU). Tempe: Arizona State University, Educational Policy Studies Laboratory.
- Bachtold, L. M. (1978). Reflections of gifted learners. *Gifted Child Quarterly*, 22, 118-124.
- Bogdan, R. C., & Biklen, S. K. (1998). *Qualitative research in education. An introduction to theory and methods* (3rd ed.). Needham Heights, MA: Allyn & Bacon.
- Brann, R. E. (1988). The PRO-TECH program: A program for gifted and talented high school students in Connecticut's vocational–technical school system. Hartford, CT: Connecticut Sate Department of Education, Division of Vocational–Technical Schools. (ERIC Document Reproduction Service No. ED311218)
- Brenneman, C. J., Justice, F. L., & Curtis, S. M. (1980). Gifted and talented students in vocational education: Review of the literature. *Journal of Vocational Education Research*, 1(3), 55-65.
- Buffer, J. J., & Scott, M. I. (1986). Special needs guide for technology education. Reston, VA: International Technology Education Association. (ERIC Document Reproduction Service No. ED299781)

- Carl D. Perkins Vocational—Technical Education Act Amendments of 1998, P.L. 105-332. Retrieved January 25, 2002, from http:// www.ed.gov/offices/OVAE/VocED/InfoBoard/legis.html
- Ciha, T. E., Harris, R., & Hoffman, C. (1974). Parents as identifiers of giftedness, ignored but accurate. *Gifted Child Quarterly*, 18, 191-195.
- Colangelo, N., Assouline, S., & Gross, U. M. (2004). A nation deceived: How schools hold back America's brightest students.
   Iowa City, IA: Connie Belin & Jacqueline N. Blank International Center for Gifted Education and Talent Development.
- Colson, S. (1982). Vocational education: Can it serve the gifted? *Roeper Review, 4,* 30.
- Colson, S., Milburn, B., & Borman C. (1983). The gifted: A new focus for vocational education. *Industrial Education*, 10, 62.
- Creswell, J. W. (1998). Qualitative inquiry and research design: Choosing among five traditions. Thousands Oaks, CA: Sage.
- Dayton, J. D., & Feldhusen, J. F. (1989). Characteristics and needs of vocational talented high school students. *Career Development Quarterly*, *37*, 355-364.
- Dembo, M. H. (1991). Applying educational psychology in the classroom (4th ed.). White Plains, NY: Longman.
- Diehl, I. W. (1976). Attracting the talented students. *Agricultural Education*, 49, 28-42.
- Ellis, J. R. (1976). A final report: An exploratory study of professional opinions and current practices regarding career education for exceptionally gifted and talented students. DeKalb: Northern Illinois University.
- Feldhusen, J. F., Moon, S. M., & Rifner, P. J. (1989). Educating the gifted and talented. *Educational Perspectives*, 26(1/2), 48-55.
- Gardner, H. (1983). Frames of mind. New York: Basic Books.
- Gentry, M. (2006). No child left behind: Neglecting excellence. *Roeper Review*, 29, 24-27.
- Gentry M., & Owen, S. V. (in press). Student Perceptions of Classroom Quality [Instrument]. Mansfield Center, CT: Creative Learning Press.
- Gentry, M., Rizza, M. G., Peters, S., & Hu, S. (2005). Professionalism, sense of community and reason to learn: Lessons from an exemplary career and technical education center. *Career and Technical Education Research*, 30(1), 25-85.
- Gohm, C. L., Humphreys, L. G., & Yao, G. (1998). Underachievement among spatially gifted students. *American Educational Research Journal*, 35, 515-531.
- Greenan J. P. (1998). Talented students in career, vocational, and technical programs. *Educational Forum*, *59*, 409-422.
- Greenan, J. P., Wu, M., & Broering, K. (1995). Talented students in career, vocational, and technical education programs. *Educational Forum*, 59, 409-421.
- Hébert, T. P., & Kelly, K. R. (2006). Identity and career development in gifted students. In F. Dixon & S. M. Moon (Eds.), *The handbook of secondary gifted education* (pp. 35-64). Waco, TX: Prufrock Press.
- Herr, E. L. (1976). Career education for the gifted and talented: Some observations. *Peabody Journal of Education*, 53, 102-103
- Higbee, J. C., & Taylor, C. W. (1990). Creative students and technical-vocational education. In C. W. Taylor (Ed.), *Expanding awareness of creative potential worldwide* (pp. 348-354). Monroe, NY: Trillium Press.
- Khatena, J. (1977). Differential guidance for the gifted: A developmental view. *Gifted Child Quarterly*, 22, 243.
- Laitsch, D. (2005). High school reform: Protecting the students' interests. Alexandria, VA: Association for Supervision and Curriculum

- Development. Retrieved July 24, 2005, from http://www.ascd.org/portal/site/ascd/menuitem.bfaa683e7841320fb85516f762108a0c
- Landrum, M. S., Callahan, C. M., & Shaklee, B. D. (2001). Aiming for excellence: Gifted program standards. Waco, TX: Prufrock Press.
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Newbury Park, CA: Sage.
- Malone, C. (1975). Potential abilities: To preserve and enhance. *Gifted Child Quarterly*, 19, 163.
- Mann, R. L. (2005). Gifted students with spatial strengths and sequential weaknesses: An overlooked and underidentified population. *Roeper Review*, 27, 91-96.
- Marland, S. P., Jr. (1972). Education of the gifted and talented: Report to the Congress of the United States by the U.S. Commissioner of Education. Washington, DC: U.S. Government Printing Office.
- Michigan Department of Education. (2001). *MDE summer institute nominee profile*. Retrieved March 14, 2006, from http://www.inghamisd.org/~suminst/pages/nominee.htm
- Miles, M. B., & Huberman, A. M. (1995). *Qualitative data analysis* (2nd ed.). Thousand Oaks, CA: Sage.
- Milne, B. G. (1982). Vocational education for gifted and talented students. Columbus, OH: National Center for Research in Vocational Education.
- Milne, B. G. (1990). Developing creative talents in the older students. In C. W. Taylor (Ed.), *Expanding awareness of creative potential worldwide* (pp. 348-354). Monroe, NY: Trillium Press.
- Patrick, H., Gentry, M., & Owen, S. V. (2006). Motivation and gifted adolescents. In F. Dixon & S. M. Moon (Eds.), *The* handbook of secondary gifted education (pp. 165-195). Waco, TX: Prufrock Press.
- Phelps, L. A. (1978). Turning the gifted on to their talents. *Vocational Education*, 53(7), 26.
- Phillips, I. (1978). Editorial: Job development. *Vocational Education*, 53(6), 29.
- Plank, S. B. (2002). A question of balance: CTE, academic course, high school persistence, and student achievement. *Journal of Vocational Education Research*, 26, 279-327.
- Pulvino, C. J., Colangelo, N., & Zaffrann, R.T. (1976). *Laboratory counseling programs*. Madison, WI: Research and Guidance Laboratory.
- Renzulli, J. S. (1978). What makes giftedness? *Phi Delta Kappan*, 60(3), 180-184.
- Renzulli, J. S., & Reis, S. M. (1997). *The schoolwide enrichment model: A how-to guide for educational excellence* (2nd ed.). Mansfield Center, CT: Creative Learning Press.
- Roberts, J. L. (2006). Teachers of secondary gifted students: What makes them effective. In F. Dixon & S. M. Moon (Eds.), *The handbook of secondary gifted education* (pp. 567-580). Waco, TX: Prufrock Press.
- Rubin, H. J., & Rubin, I. S. (1995). *Qualitative interviewing: The act of hearing sata*. Thousand Oaks, CA: Sage.
- Sak, U. (2004). A synthesis of research on psychological types of gifted adolescents. *Journal of Secondary Gifted Education*, 15(2), 70-79.
- School-to-Work Opportunities Act of 1994. Pub. L. No. 103-239 (20 U.S.C. 6101 et esq.).
- Shea, D. L., Lubinski, D., & Benbow, C. P. (2001). Importance of assessing spatial ability in intellectually talented young

- adolescents: A 20-year longitudinal study. *Journal of Educational Psychology*, 93, 604-614.
- Spradley, J. P. (1980). Participant observation. New York: Holt, Rinehart & Winston.
- Sternberg, R. J. (1985). *Beyond IQ: A triarchic theory of human intelligence*. New York: Cambridge University Press.
- Strauss, A. L., & Corbin, J. (1990). Basics of qualitative research: Grounded theory procedures and techniques. Newbury Park, CA: Sage.
- Troxclair, D. A. (2000). Differentiating instruction for gifted students in regular education social studies classes. *Roeper Review*, 22, 195-198.
- U.S. Department of Education. (1993). *National excellence: The case for developing America's talent*. Washington, DC: U.S. Government Printing Office.
- Wolcott, H. F. (1994). Transforming qualitative data: Description, analysis, and interpretation. Thousand Oaks, CA: Sage.
- Ysseldyke, J., Tardrew, S., Betts, J., Thill, T., & Hannigan, E. (2004).
  Use of an instructional management system to enhance math instruction of gifted and talented students. *Journal for the Education of the Gifted*, 27, 293-319.
- Zaffrann, R. T., & Colangelo, N. (1977). Counseling with gifted and talented students. *Gifted Child Quarterly*, 21, 309.
- Marcia Gentry, PhD, directs the Gifted Education Resource Institute at Purdue University, where she enjoys working with her doctoral students, conducting research, and teaching. Her current research interests include finding and developing talent in nontraditional places and among underrepresented populations, studying students' perceptions of schooling, and investigating effective uses of gifted education models to improve teaching and learning.
- **Saiying Hu** is a doctoral candidate at the Department of Educational Studies, Purdue University, West Lafayette, Indiana. Her research interests include research synthesis and meta-analysis, research and program evaluation, research methodology, motivation and productivity, talent development, and psychology.
- Scott J. Peters is a doctoral candidate in gifted education at Purdue University. He currently serves as a coordinator of student programs for the Gifted Education Resource Institute, administering student enrichment programs. His research interests include educational research methodology with particular focus on advanced measurement techniques such as structural equation modeling, multi-level modeling, and growth curve modeling. His research interests also include nontraditional giftedness and secondary student programming outcomes.
- Mary Rizza, PhD, is an educational consultant for gifted education at the Ohio Department of Education. Her primary responsibility is to improve gifted identification practices, particularly as they relate to underrepresented populations. She also provides technical assistance to schools on issues concerning twice-exceptional students, and she has designed online professional development opportunities for teachers as part of the Jacob K. Javits grant called I-GET-GTEd. Most recently, she was an associate professor and director of gifted programs at Bowling Green State University (Ohio), where she taught undergraduate and graduate courses in gifted education and special education, as well as educational and school psychology.