Deferential Differentiation : What Types of Differentiation Do Students Want?

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Abstract

Deferential differentiation occurs when the curriculum modification process defers to students' preferred ways of learning rather than relying on teachers' judgments. The preferences of 416 students identified as gifted (grades 3-8) for features of differentiated curriculum recommended for gifted students were compared with those of 230 students not identified as gifted. While thinking of their favorite school subject, they responded to the 110 items on the Possibilities for Learning survey. Most and least popular items are reported in nine thematic categories (pace, collaborative learning, choice, curriculum content, evaluation, open-ended activities, expert knowledge, teacher/student relationship, and sharing learning). Self-pacing, choice of topic, and choice of workmates were most popular with students in both groups. Compared with nonidentified students, more of the students identified as gifted wanted to learn about complex, extracurricular topics and authentic, sophisticated knowledge and interconnections among ideas; to work with others *some of the time*; and to choose the format of the products of their learning. More students identified as gifted also disliked waiting for the rest of the class and asking for help. Overall, the groups' preferences differed in degree rather than kind, and reflected cognitive abilities frequently cited as distinguishing characteristics of learners with high ability.

Keywords

curriculum, differentiated curriculum, differentiated instruction, differentiation, gifted, instruction, learning preferences

> Many have known a young man like Alex. He was 9 going on 90; he was worldly and wise, concerned about issues, controversies and global crises beyond his age. He had intense, piercing questions and simple answers never satisfied him. Even among his peers in a special school for gifted students, Alex was exceptional.
>
> One day, early in my work with his class, he came to me with questions about my research. He had some of those questions for me: "Dr. K., why are you having us fill out these forms after we do activities with you?"
>
> "Well, I'm trying to find out the best ways for all of you to learn."
>
> He looked down at the floor. I knew he had more to say and he was trying to find a diplomatic way to say it. He looked out from under the fringe of bangs across his forehead and said, "So, why don't you just ask us?"
>
> I did, and now I always do. Alex remains one of my wisest teachers and the inspiration for this study.

Teachers have traditionally taken major responsibility for designing differentiated curriculum, seeking guidance from the literature, experts, and colleagues in pursuit of strategies to vary instruction so it engages and enriches each of their students. As Alex points out above, students can also assist in efforts to identify those learning experiences that are likely to be most effective. Deferential differentiation occurs when curriculum modifications defers to students' learning preferences by recognizing and including them in the design process.

The general principle of curriculum differentiation reflects the intent to respond to individual differences known to exist among the students in any classroom (Shalaway, 2005; Tomlinson, 1999). For more than 50 years (e.g., Ward, 1961), educators and advocates for the needs of students identified as gifted have argued for appropriately differentiated curriculum for "those who demonstrate outstanding levels of aptitude (defined as an exceptional ability to reason and learn) or competence (documented performance or achievement in top 10% or rarer) in one or more domains" (National Association for Gifted Children, 2010, p. 1). Operationalizing this principle in the design, delivery, and assessment of learning activities is, however, a complex undertaking fraught with challenges.

As class sizes and the diversity among students increase, and resources diminish, many barriers to differentiation have surfaced including discomfort with the process, difficulty

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managing differentiated activities, lack of time to differentiate, and the diverse needs of gifted students, some of whom are twice and thrice exceptional (VanTassel-Baska & Stambaugh, 2005). Three major investigations of the extent to which students identified as gifted were receiving differentiated learning experiences in regular classrooms found relatively few teachers were making changes and the modifications being made involved only minor adjustments to core curriculum which were deemed insufficient to maintain developmentally appropriate level of challenge (Archambault et al., 1993; Reis et al., 1993; Westberg, Archambault, Dobyns, & Salvin, 1993). Innovative approaches must be found that facilitate effective differentiation in manageable, evidence-based, theory-driven ways. One approach is to relieve teachers of sole responsibility for the process.

In practice, the results of learning preference surveys can make the challenge of differentiating curriculum more manageable by reducing the scope of the options teachers consider to those most appealing to students. Deferential differentiation occurs when the features of instruction a student has identified as favorites are enhanced. The positive impact of integrating students' interests and preferences (Holzman, 1997) into classroom instruction on outcomes and motivation is well documented (e.g., Caraisco, 2007; Collins & Amabile, 1999; Kohn, 1993; Sagan, 2010; Tomlinson et al., 2003).

In addition to focusing teachers' efforts, a teacher's concern for students' learning preferences conveys a message to students, a message of caring, that is, this teacher wants to understand what they want to know and how they want to learn. This expression of caring contributes to the creation of what the Russian psychologist, Vygotsky (1978), called the "zone of proximal development" (ZPD). This zone is a theoretical, psychological "space" among participants (Holzman, 1997) in which students collaborate with others (teachers, peers, experts, etc.) to solve complex problems, gradually internalizing increasingly sophisticated psychological functions. The bottom of this zone begins with the simplest version of an activity a student needs help to complete. The top of the zone is defined by the most difficult challenge a student can learn to complete independently but needs assistance to do so. Planning for learning is an example of a problem a student and teacher might face as they work toward a student becoming an autonomous learner. Knowing how to set goals, monitor progress, locate, evaluate and organize resources—these are all aspects of autonomous learning a student may need to develop. If so, they can be learned with assistance from the teacher or others who have previously developed the psychological tools involved.

All higher psychological processes develop in the ZPD. Although the majority of the English translations of Vygotsky's work have focused on its cognitive aspects, Vygotsky (1998) was adamant regarding the interdependence of thinking and feeling. He stated, ". . . affect and intellect are not two mutually exclusive poles, but two mental functions, closely connected with each other and inseparable, that appear at each age as an undifferentiated unity" (p. 239). This interdependence of intellect and affect is relevant to all participants and activities, all relationships, in the ZPD, so expressions of caring play a significant role in learning to learn. The creation of "a ZPD with a child is the result of a series of deliberate pedagogical decisions" (Goldstein, 1999, p. 666). These decisions include a teacher's choice to recognize individual differences, such as students' learning preferences. This choice promotes the successful establishment and maintenance of the ZPD by contributing to the caring relationship students seek with teachers (Goldstein, 1999; Kanevsky & Keighley, 2003; Levykh, 2008; Fredricks, Alfeld, & Eccles, 2010).

Deferential differentiation of curriculum and instruction respects every student's need to engage in educational activities that recognize their learning preferences in their zones of proximal development. Such activities begin with an awareness of what students want so their preferences can be integrated into their learning. It does not mean teachers capitulate to students' desires. It means teachers acknowledge students' interests and preferred approaches to learning; they collaborate with students respectfully and creatively in the design and evaluation of instruction, retaining their professional imperative to ensure academic standards are met. Required outcomes can be achieved, however, deferentially, including the student more than in traditional, teacher-driven approaches to differentiation. Ultimately, the pedagogical dilemma facing teachers is determining when to control and when to share (or defer) control over differentiation, balancing what students want and what they need in order to achieve grade-level outcomes and beyond.

The theoretical and practical significance of understanding students' learning preferences motivated this investigation. Its purpose was to assess gifted students' desires to learn in the ways recommended by experts and prior research. The preferences of students who had and had not been identified as gifted were compared to investigate similarities and differences that would distinguish differentiation practices appreciated by all learners from those more popular with students identified as gifted. The findings further our understanding of the nature and extent of ability-related differences by identifying differentiation strategies that have not only been found effective in previous research but were also most appealing to highly capable students and their classmates.

Learning Preferences and Styles of Students Identified as Gifted

Although both learning preferences and styles represent individual differences that influence learning, the two differ conceptually and practically. Unlike "global" learning styles, such as those proposed by Dunn and Dunn (1978),which are "traits" expected to be stable across settings and subjects, learning preferences are "states" that are expected to vary subjects, contexts and time (Curry, 1983, 1990; Riding, 1997). This is consistent with Vygotsky's sociocultural perspective

on learning in classrooms. In it, there is no expectation of stability, acknowledging the complexity of relationships in classrooms and each individual's affinity for certain types of experiences.

Despite chronic concerns regarding their methodologies and the psychometric properties of the measures employed (Curry, 1990; Landrum & McDuffie, 2010; Reynolds, 1997), some consistencies have emerged from the findings of studies investigating the learning preferences of students identified as gifted. The studies included here address only learning preferences, not styles. A majority of the studies were undertaken in the 1980s and employed versions of Smith and Renzulli's (1984) Learning Styles Inventory (LSI; Renzulli, Rizza & Smith, 2002; Renzulli & Smith, 1978; Renzulli, Smith, & Rizza, 1998). Although the name of the instruments indicates it measures learning styles, the activities mentioned in the items represent "states" (learning preferences), more than "traits" (learning styles). This instrument provides cluster scores derived from seven to nine sets of items, depending on the version used in each study. Students are asked to indicate if each statement "describes an activity that you would like to do in school" by rating it on a 5-point scale with options ranging from "really like" to "really dislike." These "activities" are common in general education. Those included in the LSI III are direct instruction, instruction through technology, simulations, projects, independent study, peer teaching, drill and recitation, discussion and teaching games. The clusters most popular with students identified as gifted were teaching games (Boultinghouse, 1984; Li & Bourque, 1987; Ricca, 1984; Ristow, Edeburn, & Ristow, 1985; Stewart, 1981), independent study (Boultinghouse, 1984; Li & Bourque, 1987; Ricca, 1984; Ristow et al., 1985; Stewart, 1981), projects (Boultinghouse, 1984; Li & Bourque, 1987; Ricca, 1984; Stewart, 1981), and simulations (Li & Bourque, 1987; Ricca, 1984; Ristow et al., 1985). Lecture and drill activities have consistently been least popular (Chan, 2001; Li & Bourque, 1987; Ristow et al., 1985; Stewart, 1981).

In studies comparing students who had and had not been identified gifted, identified students distinguished themselves with a greater preference for independent study (Chan, 2001; Ricca, 1984; Ristow et al., 1985; Stewart, 1981). Nonidentified students were more tolerant of lectures and teacher-talk than identified students (Boultinghouse, 1984; Chan, 2001; Ricca, 1984; Stewart, 1981). Group differences were also evident regarding their eagerness to engage in group discussions; however, they were not consistent. For example, Chan (2001) and Stewart (1981) found students identified as gifted enjoyed discussions more than nonidentified; however, Ristow et al. (1985) found the opposite. It is possible that these variations were due to differences in research methods and/or students' prior experience with discussions.

Studies investigating the attitudes of students identified as gifted toward collaborative learning have generated the most inconsistent findings. Although Johnson and Englehard (1992) found that students' levels of academic achievement were not related to preferences for cooperative, competitive or individualistic learning, Li and Adamson (1992) found that secondary students identified as gifted preferred "individualistic" over cooperative learning in science, math, and English. Diezmann and Watter's (2001) rich qualitative analysis revealed that students identified as gifted did enjoy solving math problems cooperatively, but only when the task was sufficiently difficult to require authentic collaboration. This suggests there may be an interaction between features of the task and students' enthusiasm for collaborative learning. French, Walker, and Shore (2011) shed further light on the complexity of gifted students' feelings regarding collaborative learning. They concluded, "Some gifted students prefer to work alone some of the time" (p. 25); however, like the students in Diezmann and Watters's study, they "might express a preference to work with others when the learning situation is appropriate to their learning goals, and if the nature of the interaction supports their learning needs as well as those of their peers" (p. 26).

Other learner characteristics that have also been associated with gifted students' instructional preferences. These include age (Chan, 2001; Hlawaty, 2009; Honigsfeld, 2001), gender (Hlawaty, 2009; Honigsfeld, 2001; Li & Adamson, 1992; Li & Bourque, 1987; Ristow et al., 1985), and culture (Ewing & Yong, 1992, 1993; Honigsfeld, 2001; Lee & Siegle, 2008-2009; Yong & McIntyre, 1992). Variations in methods and analyses preclude efforts to derive crisp, comprehensive summary statements across these studies, leaving subsequent research to explain inconsistent findings in future studies. At this time, we have some insight into gifted students' preferences for a limited number of methods frequently used in general education. The study reported here shifts the focus, concentrating on the relative popularity of practices recommended for students identified as gifted. It compares views on these practices from learners who were and were not identified as gifted in order to address the controversy surrounding what is "good for the gifted" versus "good for all."

Curriculum Differentiation

The alignment of learner characteristics with features of their learning experiences is a fundamental principle of differentiated instruction (Shalaway, 2005; Tomlinson, 1999, 2008). Although efforts have been made to distinguish differentiated curriculum from differentiated instruction (Olenchak, 2001), the term *differentiated curriculum* will be used in an inclusive manner in this article, as in VanTassel-Baska and Little's (2011) definition:

> A differentiated curriculum for the gifted is one that is tailored to the needs of groups and/or individual learners, that provides experiences sufficiently differentiated from the norm to justify specialized intervention, and that is delivered by a trained educator of the gifted

> using appropriate instructional and assessment practices to optimize learning. (p. 10)

This definition includes content, as well as process (instruction) and product (assessment) as integral aspects of curriculum. This interdependence is also apparent in Tomlinson's (2004) definition of a more generic process of differentiating instruction for all students: "ensuring that what a student learns, how he/she learns, and how the student demonstrates what he/she has learned is a match for that student's readiness level, interests, and preferred mode of learning" (p. 188). The most significant similarity in these two definitions is the belief that students differ from each other in educationally significant ways and that these differences should be reflected in the learning experiences they are offered.

Although the notion of differentiation has appeared in educational literature since the 1950s (Good, 1959), it has gained greater significance and attention as the diversity of students in today's classrooms has increased. In response to this change, the ASCD (as cited in Shalaway, 2005) has described best practices evident in an effectively differentiated learning environment for all students:

1. Teachers and students accept and respect one another's similarities and differences.
2. Assessment is an ongoing diagnostic activity, and learning tasks are planned and adjusted based on assessment data.
3. All students participate in work that is challenging, meaningful, interesting, and engaging.
4. The teacher is primarily a coordinator of time, space, and activities rather than a provider of information.
5. Students and teachers collaborate in setting class and individual goals.
6. Students work in a variety of flexible group configurations, as well as independently.
7. Students often have choices about topics, activities, and assessment.
8. Teachers use various instructional strategies to target instruction to student needs.
9. Students are assessed in multiple ways, and each student's progress is measured at least in part form where that student began. (p. 106)

At a general level, these practices appear appropriate for students identified as gifted; however, in practice, they need to be tuned to respond to the capacities that distinguish the learning of students with high ability from their age mates. Those capacities include learning more quickly, greater depth and complexity of conceptual understanding, longer concentration on tasks, greater curiosity, a greater preference for solving more complex problems (VanTassel-Baska & Little, 2011), motivation, advanced interests, communication skills, memory, insight, imagination, creativity, inquiry, reasoning, and humor (Passow & Frasier, 1996).

VanTassel-Baska and Brown (2007) derived five essential features of best practice for gifted students after critically analyzing research examining the effectiveness of curriculum based on the major models of curriculum and instruction in gifted education. In summary, they are

1. The use of advanced curricula in core areas of learning at an accelerated rate;
2. Grouping gifted students instructionally by subject area for advanced curriculum work that would be flexibly organized and implemented based on students' documented level of learning within the subject areas;
3. Embedding multiple higher level thinking models and skills within core subject area teaching to enhance learning;
4. The use of inquiry as a central strategy to promote gifted student learning in multiple modalities;
5. The use of student-centered learning opportunities that are issue- or problem-based and relevant to the student's world. (p. 351-352)

These findings highlight features of curriculum that respond to the extraordinary abilities of these individuals. The similarities between these best practices and those proposed by the ASCD earlier have contributed to confusion and tension surrounding the distinctions between them. Isn't it all just "good education"? Aren't best practices for gifted students good for all students? The differences between the practices answer those questions; the differences in the practices reflect the differences in the students.

Deferential differentiation, based on students' learning preferences, provides teachers with a relatively direct approach to curriculum modification: give students what they want. The more common alternative is to give the gifted students what experts have said they need. In 1982, Maker proposed a system intended to give them what they need in which teachers were to select and apply one or more of 28 principles for curriculum modification. Now in its third edition, Maker and her coauthors (Maker & Nielson, 1995; Maker & Schiever, 2010) have maintained their commitment to the original 28 principles, updating the research base for each in 2010 and adding three that reflect recent investigations of problem finding, problem solving, and communication. The principles are presented in clusters that address four dimensions of curriculum:

> The six *content*-related principles focus on "concepts, ideas, strategies, images and information" (Maker & Schiever, 2010, p. 67) in curricula. They address abstractness, complexity, variety, organization for learning value, the study of people, and the study of methods.

The nine *process*-oriented principles focus on "the way educators teach and the ways students use information" (Maker & Schiever, 2010, p. 97). They include methods involving inductive teaching and learning, higher levels of thinking, open-endedness, discovery, evidence of reasoning, choice, group interaction, pacing, and the variety of processes used.

The eight outcome-oriented principles address "the nature of *products* expected of students" (Maker & Schiever, 2010, p. 143) when students demonstrate what they've learned. They recommend learning outcomes address real problems, problem finding, elements of communication, features of evaluation, transformation of content from one form to another, variety of products developed, self-selection of product format and direction of students to real audiences.

The eight principles related to the *learning environment* recommend that it is learner-centered (vs. teacher-centered), independent (vs. dependent), open (vs. closed), accepting (vs. judging), complex (vs. simple), flexible (vs. rigid); involves varied groupings (vs. similar groupings) and high student mobility (vs. low).

Rather than a model, Maker's principles represent a collection of best practices that have demonstrated their impacts in studies of individual principles rather than the integrity of the collection. Elements of VanTassel-Baska and Brown's (2007) features of research-based best practices are evident across the range of strategies included in Maker's approach (Maker, 1982; Maker & Nielson, 1995; Maker & Schiever, 2010). Although it has been popular with teachers, Maker's principles have stimulated neither empirical scrutiny nor evidence to demonstrate their value as a model to guide the development of curriculum for gifted students. Over the years, many of the practices recommended in these principles have been adopted by the differentiation movement in general education (e.g., higher levels of thinking, group interaction, authentic assessment, variety), contributing to confusion regarding the extent to which they are appropriate for most students, not just those with high ability.

Teachers take responsibility for selecting the principles to implement in students' learning experiences (Maker, 1982; Maker & Nielson, 1995; Maker & Schiever, 2010), but they need not be alone in this endeavor—students should have a role in the process of designing their learning experiences (Tomlinson, 2004). Acknowledging students' preferences and implementing them may promote a sense of self-determination, a key factor in maintaining positive attitudes toward school learning (e.g., Gentry, Gable, & Springer, 2000; Kohn, 1993) and intrinsic motivation (e.g., Zuckerman, Porac, Lathin, Smith, & Deci, 1978).

Previous studies have provided evidence of ability-related and other individual differences in students' desire to learn via methods commonly found in general education settings. Instead, this study concentrated on forms of differentiation recommended by Maker and her colleagues for students identified as gifted. To this date, students have not been given the opportunity to express their views on those practices in a systematic way. Here the preferences of students who had and had not been identified as gifted were compared to explore the nature and extent of similarities and differences in their desires to learn in these ways so we better understand which differentiation options appeal to all students, as well as those more attractive to students identified as gifted. These comparisons provide a new perspective, that of the students, on an old controversy: Are these strategies good for all students or only those identified as gifted?

Prior to initiating this study, informal discussions with bright students regarding ways their teachers might address their boredom indicated that they were most frustrated and bored by unchallenging curriculum in their favorite school subject. They hoped that their favorite school subject would to be teachers' first target for differentiation. Their recommendation is reflected in the design of this investigation as participants focused their assessments of each type of differentiation as it would feel in the subject they liked most, This further distinguishes this investigation from previous studies examining broader, global learning preferences that were expected to be stable across all subjects.

The research questions addressed in this study are

1. Which types of differentiation recommended for gifted students do students who have and have not been identified as gifted like most and least in their favorite school subject?
2. Are there differences in the direction (like/dislike) and strength of the preferences of students who have and have not been identified as gifted for the types of differentiation recommended for gifted students when learning the school subject they like most?

Method

Participants

The participants were 646 students in Grades 3 through 8 from two suburban school districts, one Canadian (n = 315) and one American (n = 331). The numbers of participants in the groups are provided by grade and gender in Table 1. The sample included 332 boys and 314 girls. Giftedness was operationally defined as enrollment in a part-time pullout program (1-3 hours per week). The 416 participants identified as gifted were involved in programs for students who were recognized as intellectually, spatially, creatively, or academically gifted (SIG). Their eligibility was based on a

Table 1. Number of Participants by Group, Grade Level, and Gender

	Students identified as gifted		Students not identified as gifted	
Grade	Girls	Boys	Girls	Boys
3	31	31	11	7
4	44	28	28	24
5	28	38	21	39
6	31	46	21	8
7	31	44	6	7
8	35	29	27	31
Total	200	216	114	116

variety of formal and informal assessment procedures determined by each school district's policies. The 230 students who served as the comparison group were not identified as gifted (SNIG) and received full-time instruction in regular classrooms. It is likely that this group included a small number of students who were gifted but had not been identified or were not participating in programs at the time of this study. The cultural diversity within the groups was similar. Of the participants identified as gifted, 82% were Caucasian, 14.4% were Asian, and 3.8% were of other ethnicities; 81% of those not identified as gifted were Caucasian, 11.7% were Asian, and 7.4% were of other ethnicities. Teachers were recruited by the researcher with the help of each district's Coordinator of Gifted Programs and students participated voluntarily.

Instrument

Students completed the Possibilities for Learning[1] survey (PFL; Kanevsky, 1999), a 110-item instrument asking students to rate their preference for features of learning experiences on a 5-point Likert-type scale from strongly agree (SA) to strongly disagree (SD). Each of the 110 "I really like . . ." items addressed a variation of one of Maker's (Maker, 1982; Maker & Nielson, 1995; Maker & Schiever, 2010) principles of curriculum differentiation for SIG. Examples of phrases completing this sentence stem for each item can be found in the tables later in text. Sixteen items were content related, 28 were related to processes, 21 related to products, and 45 addressed the learning environment. Three items were included that addressed learning experiences students were not expected to like in an effort to identify students who may have been responding randomly so their responses could be excluded from the data analysis. They addressed taking tests, learning from textbooks, and asking for help. Before responding to the items, students specified which of five school subjects was their favorite (math, reading, writing, science, social studies). They were directed to respond to each item with learning that subject in mind.

Krueger and King's (2000) five steps to creating a content-valid measure were integrated in to the process of developing the PFL. First, the definition of learning preference was specified as students' eagerness to engage in learning activities with the features recommended in Maker's collection of differentiation strategies. Then an initial pool of 240 items was generated. A 5-point Likert-type scale response format (strongly agree to strongly disagree) was selected as it was deemed clear and meaningful to elementary and secondary students. The survey needed to include a representative range of possibilities related to each of Maker's strategies and be easy to code and interpret.

Four educators and 20 students in Grades 3 to 10 reviewed the initial 240 items. They provided feedback on the clarity and accuracy of the instructions and item content as well as the format, ease of use and length of the first draft. The length was reduced to 144 items due to concerns regarding redundancies, fatigue, and the time required for completion. Revisions were made and a second version was piloted with 14 students in Grades 4 to 6. Further revisions were made based on their feedback to enhance clarity and further reduce the length to 110 items. This version was piloted with a second group of fourth to sixth graders and their teachers who recommended minor revisions in the language.

The content of the items on the PFL used in this study was compared with the definitions of each of Maker's differentiation principles to ensure all were addressed and to establish the content validity of the instrument. All were represented; however, some strategies required more items to address a range of ways they might be implemented. Although all possible variations were not included, participants in the pilots were satisfied that the instrument was sufficiently comprehensive, clear, and manageable.

Four educators determined the face validity of the PFL, two of whom were graduate students studying gifted education. They correctly identified the principle of differentiation each item was intended to represent and felt the language would be meaningful to members of the target population (students in Grades 3-12).

Reliability coefficients for PFL ratings had not been investigated prior to this study. They are reported in the "Categories" subsection of the Results and Discussion.

Procedure

The PFL was administered either by students' regular teacher, the teacher, or coordinator of the pullout program, or the author. Students took 40 to 90 minutes of class time to complete the survey.

Results and Discussion

Students' responses are reported as percentages and interpreted descriptively as percentages were considered the most

Table 2. Items Receiving Similar Frequencies of Positive Ratings From More Than 75% of Students Identified as Gifted (SIG) and Students Not Identified as Gifted (SNIG)

	Percentage positive	
Item text	SIG (n = 416)	SNIG (n = 230)
I really like …		
learning at my own speed.	90.4	87.1
doing projects with a partner when I get to choose my partner.	89.1	85.1
learning about topics I choose. It might be ANYTHING!	87.1	88.4
doing projects in a group when I get to choose my group.	83.5	83.0
learning when I get to choose the way I get to learn (from books or experts; groups or alone; worksheets or projects).	82.9	74.4
learning with a partner who learns as quickly as I do.	79.8	75.6
using computers to find new information through the Internet and databases.	79.4	70.1
knowing how I will be graded before I begin.	77.5	72.5
working with kids who learn as quickly as I do when I'm learning in a group.	76.8	69.1
doing activities that have more than one right answer and more than one way to find it.	76.0	71.3

appropriate means of representing the distribution of students' ratings in each group. Inferential statistical analyses, such as chi-squares and/or log-linear analysis, were not appropriate because of the number of empty cells in the data set. An empty cell indicated no students responded in at least one rating category on an item.

Results reported in the text and Table 2 were limited to the 56 items with the highest positive and negative frequencies. These items achieved the cutoffs for practical significance for these results established through consultations with practitioners as recommended by Gall, Gall, and Borg (2009). Unlike objective measures of statistical significance, determinations of practical significance are more subjective (Kirk, 2001). They focus on the importance of research results for the improvement of practice (Gall, 2001).

> We need judgment and expertise to interpret the meaning of statistical results and their value, if any, for professional practice. In our view, a statistical result has *practical significance* if it has, or might, have important consequences for the individuals for whom the result is relevant. (Gall et al., 2009, p. 171)

Three practitioners were recruited. All were graduate students in education in addition to their professional duties. One was a district coordinator of programs for gifted students, one a counselor in a K-12 school, and one a regular classroom teacher in a middle school. The group set the cutoffs that would guide the interpretation of the results. They agreed the results for each item had implications for classroom practice if

> At least 60% of the student respondents felt positively about it by giving it a rating of "agree" or "strongly agree."
>
> At least 40% of respondents felt negatively about it by giving it a rating of "disagree" or "strongly disagree"
>
> The percentages for students who were and were not identified gifted differed by at least 10%.

They felt a cutoff 20% lower for unpopular features of learning activities was justified in light of research evidence indicating students' attitudes, motivation, and academic achievement suffer when students do not like what and how they learn.

"Percentage positive" values in the tables represent the percentages of students who indicated they enjoyed the type of experience described in the item by responding "agree" (A) or "strongly agree" (SA). "Percentage negative" indicates the proportion of students who responded "disagree" (D) or "strongly disagree" (SD), indicating they did not like learning as described in the item. At times, this text specifically targets a particular rating level, for example, "strongly agree" or "strongly disagree."

And what about the 54 items that did not earn high positive or negative percentages? On each of those items, the responses of students in both groups were scattered across the five rating categories (SA to SD). In practical terms, this meant as many students wanted it more as wanted it less or were neutral. They remain valid forms of differentiation, but they were not distinguishable as particularly popular or unpopular with these students.

Most and Least Popular Types of Differentiation With All Participants

Similarities in the preferences of students who were and were not identified as gifted (SIG and SNIG). When the participants imagined learning their favorite subject, three things became

Table 3. Items Receiving Negative Ratings From More Than 50% of Students Identified as Gifted (SIG) and Students Not Identified as Gifted (SNIG)

	Percentage negative	
Item text	SIG (*n* = 416)	SNIG (*n* = 230)
I really like . . .		
learning under pressure like when I've missed school and the rest of the class is ahead of me.	68.1	67.3
working with kids who learn more quickly than I do in my group so I have to work very hard to keep up with them.	61.5	64.4
learning with students older and younger than me.	28.5	34.9
having my desk in a corner of the room, away from everyone, so I can have my privacy.	61.2	68.1
a partner who learns differently from the way I learn, when I'm learning with a partner.	31.4	39.2
I really like working with kids who learn differently from the way I learn, when I'm learning in a group.	36.8	35.2
sitting with our desks in rows so there is someone in front of me.	39.9	38.2
sharing my work with classes of older students.	57.9	62.5
working with a partner, when my partner learns more quickly than I do so I have to work very hard to keep up.	57.8	63.1
doing projects in a group when my teacher assigns me to my group.	55.5	51.5
doing projects with a partner when my teacher assigns me a partner.	55.5	60.7
having kids in my class teach me.	55.3	50.4
learning from textbooks.	54.2	45.4
having my teacher choose the way I should show what I have learned.	53.4	52.9
learning with a partner who learns more slowly than I do so I am teaching what I already know.	51.3	50.9

clear: (a) students preferred some forms of differentiation over others, (b) a large number of the practices recommended for SIG were enormously popular with participants in both groups, and (c) no single item or form of differentiation was unanimously adored, although self-pacing, choice of topic and choice of group workmates came very close.

Overall, the most popular items indicated that students in both groups shared a desire to personalize the process of learning in their favorite subject. In Table 2, the "Percentage positive" for students in both groups were similar on five of the six items that appealed to 80% or more of all students. Whether or not they were identified as gifted, a large majority of these students sought opportunities to control aspects of learning experiences that were important to them, for example, pace, topic, and workmates.

The importance of the social dimensions of classroom learning was evident in most of the items disliked by the majority of students in both groups (see Table 3). In summary, they objected to feeling pressured to catch up, working with group mates who learned faster or slower than they did, sitting alone, being assigned workmates, being taught by classmates, and sharing their work with older students. Neither group enjoyed learning about their favorite subject from textbooks or having their teacher determine the way their learning was represented.

Group differences between the preferences of the SIG and SNIG. The groups differed significantly (more than 10% difference in groups' percentages) on 14 of the 56 (25%) items achieving practical significance. As can be seen in Table 4, the SIG were higher on all but 2 of these 14 items, and the majority of the items focused on qualities of the content.

More of the SIG preferred complex content and problems (+19.8%), pursuing their own interests (+11.7%) in "weird" topics (+18%), understanding the interconnections between ideas (+16.4%), collaborating with others, but not all of the time (+13.9%), authentic, expert knowledge (+12.8%), finding creative solutions to challenging problems (+11.5%), and determining the format of their product (+12.4%). These findings are not surprising given that the SIG were selected for participation in special programming partially based on their capacity for conceptual thinking, complex problem solving and creativity. It is also possible that their previous special program experiences offered opportunities to pursue their passions and strange topics, work with expert knowledge and messy problems, and so on, hence the frequency of positive ratings for these by gifted students may have been enhanced by familiarity while those of the nonidentified students may have been diminished by a lack of experience with them.

Concerns related to relationships with others are again evident among the most unpopular items that showed group differences. Significantly more SIG disliked asking for help (+17.1%) and waiting for classmates to catch up (+13.7% more). Significantly fewer SIG disliked sitting alone (−10.6%) and sharing their work with groups outside of school (−11.8%).

The item addressing small facts, slow pace and practice was the only item on the survey to generate reversed results

Table 4. High-Frequency Items on Which Students Identified as Gifted (SIG) and Students Not Identified as Gifted (SNIG) Groups Differed by More Than 10%

	Percentage positive		Percentage negative	
Item text	SIG (*n* = 416)	SNIG (*n* = 230)	SIG (*n* = 416)	SNIG (*n* = 230)
I really like . . .				
learning about weird topics that I wonder about. They are things that we don't study in school.	84.5	66.5		
doing activities that let me learn something new that is different from what anyone else in my class learns.	76.0	64.3		
understanding complicated ideas and problems.	75.2	55.4		
finding creative solutions to difficult or weird problems.	72.6	61.1		
working in groups sometimes and working alone sometimes.	72.2	58.3		
understanding things the way experts do.	67.8	55.0		
choosing the way I will show what I've learned.	64.3	51.9		
understanding the ways ideas are connected.	63.5	47.1		
sitting alone.			59.3	69.9
waiting until everyone in the class or group understands the lesson before going on to a new idea.			53.4	39.7
asking for extra help.			49.6	32.5
learning small bits of information at a slow, easy pace with lots of practice.	[30.0]	[55.2]	46.9	19.4
teaching other kids in my class.			45.1	69.6
sharing my work with groups of adults outside of school.			40.1	52.9

from the two groups. Almost 47% of the SIG disliked this item compared with 19.4% of the SNIG; however, 55.2% of the SNIG enjoyed it compared with 30% of the SIG. These results highlighted two commonly reported attributes that distinguish high-ability learners from their peers: their facility with abstract understandings and their rapid learning. Again, it is not surprising that many students who differ from each other in these ways would prefer distinctly different types of content aligned with their capacities.

More than the SNIG, the SIG sought rich, authentic content related to their interests, whether or not the topics were addressed in grade-level curriculum. It was apparent that more SIG than SNIG sought rigorous, relevant content at a challenging pace, within and beyond core curriculum. They did not want to "coast" through school; they felt challenging content was fun (see also Kanevsky & Keighley, 2003). Waiting for others to catch up and seeking help from their teacher bothered more of the SIG, whereas more of their nonidentified peers did not want to sit alone or present their work to adults outside of the school. In fact, sitting alone was the most disliked differentiation option for nonidentified students.

Categories

Although Maker's (Maker, 1982; Maker & Nielson, 1995; Maker & Schiever, 2010) four "dimensions of curriculum" (content, process, product, learning environment) had been used to develop and organize items on the PFL, they were abandoned during the data analysis in favor of categories that better represented features of classroom practices. Nine thematic clusters of items were developed to organize the presentation of the results: pace, collaborative learning, choice, curriculum content, evaluation and feedback, open-ended activities, expert knowledge, the teacher, and sharing learning (see Table 5). The order in which the categories appear in Table 5 was determined by ranking the percentages of the most popular item in each category.

Cronbach's alpha coefficients were calculated for each cluster of items to determine their internal consistency (reliability). Cronbach (1951) recommended computing separate alpha coefficients for each category rather than one for the entire survey when items in each category are related to different factors. The alpha coefficients appear in the parentheses following each category's name in the text. Five of the coefficients (collaborative learning, curriculum content, open-ended activities, expert knowledge, and sharing) are greater than .7 and considered acceptable (Field, 2005), whereas four (pace, choice, evaluation, and teacher/student relationships) are between .63 and .69. Kline (1999) indicated that .7 is a suitable cut-off for constructs other than intelligence. He also felt lower values can be expected and accepted, particularly when the number items contributing to the coefficient is small, as is the case here. Kline's comments support the credibility of this instrument; however, the PFL will need further revision to improve these values before using it in future studies.

Table 5. Percentages of Students Identified as Gifted (SIG) and Students Not Identified as Gifted (SNIG) Giving Positive (Agree or Strongly Agree) or Negative (Disagree or Strongly Disagree) Ratings to Most and Least Popular Items in Each of the Nine Categories

	Percentage positive		Percentage negative	
	SIG (*n* = 416)	SNIG (*n* = 230)	SIG (*n* = 416)	SNIG (*n* = 230)
I really like . . .				
1. Pace				
learning at my own speed.	90.4	87.1		
learning with a partner who learns as quickly as I do.		75.6		
working with kids who learn as quickly as I do, when I'm working in a group.		69.1		
having lots of time to dig in to ideas and projects.	74.1	77.1		
having time to think after being given a really difficult idea to understand. I don't like to rush when I'm working on hard stuff.	73.6	79.0		
having time to think about my ideas before I start to work on an assignment.	69.0	70.0		
assignments that can be finished in one class.	63.3	65.6		
to work hard on my assignments until I'm ready to stop. It might be longer or shorter than the time shown in our timetable.		54.8		
learning about topics in a short time with lots of new ideas at a challenging speed with very little practice and repetition.		39.0		
it when my teacher changes the timetable so we can investigate something fascinating that we are talking about.		49.8		
to have lots of practice with a new way of thinking in different assignments so I feel sure I know it. Then I'm ready to learn another way of learning.		51.6	17.1	16.4
having a lot of practice and repetition in my assignments.		55.9		
the timetable to be predictable so we study each subject at the same time each week for the same amount of time.		34.0	22.9	26.0
learning small bits of information at a slow, easy speed with lots of practice.		55.2	46.9	19.4
learning under pressure like when I've missed school and the rest of the class is ahead of me.			68.1	67.3
waiting until everyone in the class or group understands the lesson before going on to a new idea.			53.4[a]	39.7[a]
learning small bits of information at a slow, easy pace with lots of practice.	[30.0]	[55.2]	46.9[a]	19.4[a]
2. Collaborative learning				
doing projects with a partner when I get to choose my partner.	89.1	85.1		
doing projects in a group when I get to choose my group.	83.5	83.0		
learning with a partner who learns as quickly as I do.	79.8	75.6		
working with kids who learn as quickly as I do when I'm learning in a group.	76.8	69.1		
working in groups sometimes and working alone sometimes.	72.2[a]	58.3[a]		
sitting in clusters of 3-6 desks.	62.4	57.7		
learning by working on my own.		46.8		
working with kids who learn more quickly than I do in my group so I have to work very hard to keep up with them.			61.5	64.4
learning with students older and younger than me.			28.5	34.9
having my desk in a corner of the room, away from everyone, so I can have my privacy.			61.2	68.1
a partner who learns differently from the way I learn, when I'm learning with a partner.			31.4	39.2
working with kids who learn differently from the way I learn, when I'm learning in a group.			36.8	35.2
sitting with our desks in rows so there is someone in front of me.			39.9	38.2
sitting alone.			59.3[a]	69.9[a]
working with a partner, when my partner learns more quickly than I do so I have to work very hard to keep up.			57.8	63.1
doing projects in a group when my teacher assigns me to my group.			55.5	51.5
doing projects with a partner when my teacher assigns me a partner.			55.5	60.7
having kids in my class teach me.			55.3	50.4

(continued)

Table 5. (continued)

	Percentage positive		Percentage negative	
	SIG (*n* = 416)	SNIG (*n* = 230)	SIG (*n* = 416)	SNIG (*n* = 230)
learning with a partner who learns more slowly than I do so I am teaching what I already know.			51.3	50.9
learning in a group with kids who learn more slowly than I do so I am teaching them what I already know.			47.3	41.3
3. Choice				
learning at my own speed.				4.0
doing projects with a partner when I get to choose my partner.				2.6
learning about topics I choose. It might be ANYTHING!	87.1	88.4		
doing projects in a group when I get to choose my group.	83.5	83.0		
learning when I get to choose the way I get to learn (from books or experts; groups or alone; worksheets or projects).	82.9	74.4		
using computers to find new information through the Internet and databases.	79.4	70.1		
doing activities that let me learn something new that is different from what anyone else in my class learns.	76.0[a]	64.3[a]		
choosing the way I will show what I've learned.	64.3[a]	51.9[a]		
learning centers where I can choose activities.	63.3	58.8		
to work hard on my assignments until I'm ready to stop. It might be longer or shorter than the time shown in our timetable.		54.8		
it when my teacher lets me follow an interesting idea instead of doing the work that the rest of the class is doing.		50.3		
discovering reasons for things I don't understand by experimenting on my own.		50.2		
learning from books I find in the library and at home and other places.		40.9		
finding a weird idea and taking it apart. Then I try to find out how the parts work or what they mean.		42.8		
to grade my own work.		55.0		
to choose the way my teacher will grade my assignments.		39.0	20.0	28.0
going to the public library to do research on my favorite topics.		47.0	24.3	27.1
discovering reasons for things I don't understand by experimenting with help from a teacher.		40.6	36.2	33.0
to work on assignments my teacher gives me.		25.1	28.7	39.5
doing projects with a partner when my teacher assigns me a partner.		20.1	55.5	60.7
having my teacher choose the way I should show what I have learned.			53.4	52.9
learning about topics chosen by the teacher.			47.0	53.5
4. Curriculum content				
learning about topics I choose. It might be ANYTHING!		88.4	3.4	4.0
learning about weird topics that I wonder about. They are things that we don't study in school.	84.5[a]	66.5[a]		
understanding complicated ideas and problems.	75.2[a]	55.4[a]		
studying REAL problems like endangered species, pollution, peace, politics, power, death, . . .	69.6	65.0		
learning about computers and technology.	66.5	58.0		
understanding how and why things happen.	64.9	66.3		
understanding the ways ideas are connected.	63.5[a]	47.1[a]		
finding a weird idea and taking it apart. Then I try to find out how the parts work or what they mean.		42.8		
learning about the lives of famous people (from history and today).		62.2		
learning small facts like correct spelling and grammar, math facts, countries and their capitals, important dates in history.		44.4	27.8	27.1
learning from textbooks.			54.2	45.4
understanding confusing feelings.		31.5	24.3	39.7
to think in symbols, not words.		37.6	35.7	35.5
to copy information and ways of doing things.		38.8	39.1	31.8
memorizing facts and definitions.			46.3	43.5

(continued)

Table 5. (continued)

	Percentage positive		Percentage negative	
	SIG (*n* = 416)	SNIG (*n* = 230)	SIG (*n* = 416)	SNIG (*n* = 230)
5. Evaluation				
knowing how I will be graded before I begin.	77.5	72.5		
knowing if my grade is better or worse than my classmates.	63.0	58.4		
to have my teacher grade my work.		51.1		
to have an expert's opinion of my work.		44.5		
Even when I get a good grade I really enjoy hearing about ways it could be improved.		56.9		
to grade my own work.		55.0		
to have an expert grade my work.		40.0	21.5	33.9
like to have my work graded the same way an expert's would be judged.		41.4	27.5	36.0
discussing my grade with my teacher.		35.3	28.4	33.5
to hear about the good parts of my work but it upsets me to hear about the things that could be improved.		43.6	31.7	25.0
tests.			46.7	51.8
6. Open-ended activities				
doing activities that have more than one right answer and more than one way to find it.	76.0	71.3		
experimenting. I can find ways to experiment with my ideas in any subject. It might be writing, math, music, or science.	74.0	67.0		
finding creative solutions to difficult or weird problems.	72.6[a]	61.1[a]		
Sometimes I like to work in groups and sometimes I like to work alone.		58.3		
it when my teacher encourages me to try out a new idea I just thought up, even if it sounds weird.		56.9		
to learn in lots of different ways in different assignments.		51.3		
discovering reasons for things I don't understand by experimenting on my own.		50.2		
to show what I've learned in different ways each time. One time it might be a poster, another time it might be a play, and another time I'd do a report or maybe a worksheet.		50.0		
discovering new ideas by looking in new ways at things that look familiar like the addition table, a list of words, or a tree.		42.4	20.9	28.6
discovering reasons for things I don't understand by experimenting with help from an expert.		48.2	23.8	24.0
discovering reasons for things I don't understand by experimenting with help from a teacher.		40.6	36.2	33.0
trying to figure out how or why something happens a certain way from reading books.		36.9	24.1	29.6
7. Expert knowledge				
understanding things the way experts do.	67.8[a]	55.0[a]		
having visitors come to school to talk about my favorite topics.	63.5	58.9		
learning about real things that experts need to know to be experts.	60.4	54.3		
I really like going to places outside of school where people are using skills in my area of strength in their work.		50.2		
learning when I'm using the same materials and skills that experts use at work.		45.9		
discovering reasons for things I don't understand by experimenting with help from an expert.		48.2	23.8	24.0
to have an expert grade my work.		40.0	21.5	33.9
to have my work graded the same way an expert's would be judged.		41.4	27.5	36.0
trying to figure out how or why something happens a certain way from talking with experts.		39.8	22.4	29.9
trying to figure out how or why something happens a certain way from listening to experts.		40.6	25.3	27.8
learning about people's jobs.		37.2	31.0	33.7
8. The teacher/student relationship				
having my teacher try really hard to understand what I'm saying or what I'm feeling.	64.7	66.5		

(continued)

Table 5. (continued)

	Percentage positive		Percentage negative	
	SIG (*n* = 416)	SNIG (*n* = 230)	SIG (*n* = 416)	SNIG (*n* = 230)
having my teacher encourage me to try out a new idea I just thought up, even if it sounds weird.	62.4	56.9		
it when my teacher lets me follow an interesting idea instead of doing the work that the rest of the class is doing.		50.3		
having my teacher grade my work.		51.1		
it when my teacher changes the timetable so we can investigate something fascinating that we are talking about.		49.8		
talking with my teacher.		38.4	26.2	30.1
discovering reasons for things I don't understand by experimenting with help from a teacher.		40.6	36.2	33.0
asking for extra help.			49.6[a]	32.5[a]
to change ideas from one form to another, like changing a story into a play, a math problem into music, or changing a feeling I get from a picture into a poem.		45.9	35.1	27.4
9. Manipulating ideas	SA + A	SA + A	SD + D	SD + D
understanding complicated ideas and problems.	75.2	55.4		
to change ideas from one form to another, like changing a story into a play or a math problem into music, or changing a feeling I get from a picture into a poem.	55.9	38.4		
learning by building models of what I am learning.	0.0	54.8		
I need to understand how and why things happen.	64.9	66.3		
imagining pictures of what I am learning in my mind.	63.9	60.9		
understanding the ways ideas are connected.	63.5	47.1		
10. Sharing learning				
sharing my work with my family.	60.8	64.8		
to talk in group discussions.		54.1		
group discussions.		53.8		
teaching children younger than me.		53.5		
hearing about how other students are thinking about something I'm having trouble with.		44.0	24.4	21.2
explaining my thinking to other students.		39.2	28.3	32.0
sharing my work with classes of younger students.		42.2	28.8	32.1
sharing my work with classes of older students.			57.9	62.5
telling my class about what I've been learning.			42.6	52.3
sharing my work with groups of adults outside of school.			40.1[a]	52.9[a]
teaching other kids in my class.			45.1[a]	69.6[a]

Note. SA = strongly agree; A = agree; SD = strongly disagree; D = disagree.
a. Indicates that percentages between groups differed by 10% or more.

Most investigations of learning preferences have pooled data in clusters of items identified via factor analyses when developing an instrument and establishing its psychometric properties (e.g., Chan, 2001). The factors that emerged from the data were given names like "independent study" or "discussion." The total of a student's ratings for all items contributing to a factor were reported as a composite score. Unlike those studies, the findings reported here remain at the item level as their purpose was to identify specific features of curriculum most students liked or disliked. The items have been organized in categories for clarity, but the items in each were not collapsed into composites. Each item was interpreted discretely as the small distinctions among the items within categories generated very different results. These distinctions would have been lost had the data been consolidated for each category.

Pace (α = .63; 7 of possible 12 items). Of the 110 possibilities on the PFL survey, the 2 items the SIG liked most and least overall were found in this category. Self-pacing was the most popular practice and working under pressure to catch up after an absence was the least. A total of 74% gave self-pacing the highest rating (SA) and another 13.9% rated it positively (A). It was slightly less popular with the SNIG (65.9% SA and 21.2% A), but still highly valued.

More than 70% of students in both groups reported enjoying having plenty of time for projects and reflecting on difficult material before getting down to work. It was noteworthy that although 46% of the SIG strongly agreed with these two

practices, it was even more popular with the SNIG. Overall, 54% of the SNIG strongly agreed with wanting time to "dig in" and 57% gave this rating to "think time." Students in both groups also liked assignments that could be completed in one class; however, again, more SNIG felt strongly positive (47.5% SNIG vs. 40.6% SIG). In contrast, close to half of both groups felt very negatively (SD) about learning under pressure after an absence from school. The greatest difference between the groups on items related to pace, 13.7%, arose with regard to "waiting until everyone understands." More than half of the SIG disliked waiting compared to 39.7% of the SNIG.

Learning at their "own speed" may have been interpreted as acceleration by students who resent waiting. Carroll's (2008) talented artists also reported they felt "anxious, frustrated, and start to lose interest if they have gotten the point" (p. 43). Or, for other students, self-pacing may have meant having time to immerse themselves, "dig in," when working on projects or challenging material in their favorite subject. The wording of the item invites both interpretations. Implementing one or more of the 17 types of acceleration described by Southern and Jones (2004) in the Nation Deceived report could help teachers create opportunities for these students to learn at a pace and depth commensurate with their abilities and interests, allowing for reflection and speed, as needed.

Collaborative Learning (α = .71; 15 of 22 items). A greater proportion of items in this category achieved significance than in any other. The four most popular items in it make it clear that students in both groups preferred to work with peers of their own choosing and with others who learned at the same pace. The latter was reinforced by the high percentage of negative ratings given to learning with students who learned more quickly or slowly, and being assigned workmates. Although 72.2% of the SIG and 58.3% of the SNIG sometimes prefer to *work* alone, ratings for three items related to seating arrangements indicated that a majority of students in both groups did not want to *sit* alone. Ten percent more of the SNIG than the SIG deeply disliked sitting alone and working alone on big projects. It was also noteworthy that more than half of the students in both groups disliked being taught by a classmate.

As mentioned previously, the feelings of the SIG regarding collaborative learning have generated inconsistent findings in prior research. Studies reporting ability-related differences in the popularity of independent study (Chan, 2001; Ricca, 1984; Ristow et al., 1985; Stewart, 1981), and of "individualistic" learning versus cooperative or competitive (Li & Adamson, 1992), have contributed to the widely held belief that SIG always prefer to learn alone (Winner, 1996). Almost three quarters of gifted participants in this study indicated this was true, but *only some of the time*. French et al. (2011) reported the same finding. Certain conditions appear to be critical factors. Most students, whether or not they have been identified as gifted, did not want to work alone on big projects in the subject they enjoyed most. Further, when learning collaboratively, both groups indicated that they wanted to choose their workmates, and wanted workmates who learned at a pace similar to their own. The numbers were strong and clear on these points.

The findings of past studies reporting a preference for individualistic learning may reflect differences in respondents' attitude toward the unspecified composition of the groups. For example, in 1992, Li and Adamson's participants likely assumed teachers would assign them to mixed-ability groups, as this was standard practice for cooperative learning groups at that time (Johnson, Maruyama, Johnson, Nelson, & Skon, 1981; Slavin, 1983). Thus, it is likely their results indicated the students preferred to work alone rather than in heterogeneous groups constructed by their teacher, and should be limited to those contexts. More than 85% of the students in this study wanted to collaborate on projects in their favorite subject IF they chose their partner or group members. When learning addresses their favorite subject, self-selected or homogeneous ability-grouping were the options these students preferred.

Choice (α = .68; 8 of 14 items). More than 70% of all participants were very eager (SA) to choose the topics of their studies (71.9% SIG and 70% SNIG), and another 17% agreed but did not feel as strongly. Carroll (2008) also reported that talented artists appreciated opportunities to connect their studies with their interests. The students in this study wanted to determine the way they learn, to discover information online, and to work in learning centers. Significantly more SIG wanted the freedom to pursue topics different from those of interest to the SNIG (76% SIG vs. 51.9% SNIG). Students' enthusiasm for having their choices honored is consistent with the findings regarding Collaborative Learning as choice was also involved the two most popular items in that category.

Offering students choice, control and self-determination has been recommended for all students for decades (Dewey, 1938; Kohn, 1993; Zuckerman et al., 1978) and particularly for SIG (e.g., Gentry, Rizza, & Owen, 2002; Maker, 1982; Maker & Nielson, 1995; Maker & Schiever, 2010; Tomlinson, 2004; Tomlinson et al., 2003). The positive outcomes of studies investigating the impacts of student choice and control make it difficult to dispute the academic, motivational and behavioral benefits of implementing students' learning preferences (Caraisco, 2007; Gentry, et al., 2002; Kanevsky & Keighley, 2003; Kohn, 1993; Sagan, 2010; Tomlinson et al., 2003; Zuckerman et al., 1978). Ideally, options should be student generated and substantial (Kohn, 1993); however, even "trivial" opportunities to control minor features of activities also resulted in significant increases in three types of motivation: achievement, intrinsic and effectance (the desire for challenging, independent work; Cordova & Lepper, 1996; Pearlman, 1984).

Students in this study indicated they most desired choices regarding topics, resources, workmates, learning alone or with others, format of the product, and control over the pace.

More than the SNIG, many of the SIG wanted the freedom to pursue their interests and to determine how they would represent their learning. Opportunities to control one, some or all features of a learning experience can be woven in to most classroom activities (see Kohn, 1993).

Curriculum Content (α = .71; 9 of 15 items). As mentioned earlier, although the Curriculum Content category did not include the greatest number of items, it did include the greatest number of items generating group differences: three. They appeared in the two most popular items in this category (studying weird topics and understanding complex ideas) and one other (understanding connections among ideas).

Many of the students in both groups shared an eagerness to study authentic problems and understand how and why things happened. They also shared a dislike for memorizing facts and definitions and learning from textbooks. These results indicate the majority of students were looking for sophisticated content and problems when studying their favorite subject, not the superficial, repetitive, decontextualized treatment often given in textbooks (Reis et al., 1993). Like the young adult artists in Carroll's (2008) study, they "want to make real-life connections with concepts and information." (p. 41). Additional evidence of their desire for authenticity will be discussed below in the upcoming "Expert Knowledge" category.

Translating a preference for complex, challenging content into classroom practice appears deceptively simple: let more capable learners work in more sophisticated content while offering less capable classmates relatively more concrete material. Many teachers find this difficult due to a lack of subject matter expertise, lack of suitable resources and time management challenges. Even when teachers are content experts, the diversity among students proves challenging (VanTassel-Baska & Stambaugh, 2005).

A situation in which offering complex, abstract content could be problematic arose in a subsequent analysis of a subsample of the participants in this study. It focused on the responses of the SIG who were learning English as an additional language (Peters, 1998). Peters found the English learners welcomed the small facts, slow pace and extended practice that did not appeal to the SIG who were fluent in English. The value of seeking individual students' input on these features of learning activities cannot be understated and will prevent similar simplistic overgeneralizations in practice.

Evaluation (α = .64; 3 of 12 items). No significant group differences appeared in this category suggesting that all respondents shared similar preferences and concerns regarding the assessment practices mentioned in the items. Approximately three quarters of the students in both groups agreed with assessment and instructional design experts who insist students need to understand the evaluation scheme before beginning an activity (e.g., Stiggins, 2009; Stiggins, Arter, Chappuis, & Chappuis, 2004; Wiggins & McTighe, 2005).

It was not surprising to find that many students in both groups disliked tests but it was unexpected that only half of the students felt this way. The data were scrutinized to ensure students had not responded randomly as this was one of the items included for that purpose. The response patterns indicated students who responded positively, that is, they liked tests, were responding intentionally, not accidentally or randomly. There are a number of potential explanations for this result. It may be that students valued test results for the feedback they provided regarding the accuracy and extent of their understandings. Perhaps this information was considered valuable in their efforts to improve (Dweck, 2006). It is also possible they derived objective comparative information from test scores regarding their rank in the class, especially when the majority of responses to a related item indicated they also wanted to know if their grade was "better or worse than my classmates." Bloom's (1985) finding from his retrospective study of highly successful talented individuals suggests that this type of competition is a likely motive for some students. A third possibility is that the participants may have developed an appreciation for scores in this era of high-stakes testing. They are a familiar means of communicating academic accomplishments with parents and others. It is likely that the students valued tests for one or more of these reasons.

Open-Ended Activities (α = .72; 3 of 9 items). More than two thirds of students in both groups reported enjoying experimenting and doing activities with multiple answers and paths to them. This passion for process was also apparent in Hertzog's (1998) qualitative analysis of students' learning from open-ended tasks. She found the greatest differences in learning outcomes arose when content and process options were offered, rather than product. She found students' responses varied in ways that reflected their academic ability, creativity, and personal interests when the product was highly structured, and content and process alternatives were permitted.

Researchers involved with talented artists (Carroll, 2008) as well as neuroscientific analyses of mathematically gifted students (O'Boyle, 2008) also recommend multimodal instruction, that is, using a variety of modes or processes in instruction and learning activities. Fifty-eight percent of the artists in Carroll's study advised teachers to use "multiple modalities in teaching rather than textbooks" (p. 41).

Twelve percent more SIG than SNIG were extremely eager (SA) to engage in activities allowing creative problem solving (43.6% SIG vs. 31.5% SNIG). It appears that providing students with opportunities to test hypotheses and explore ideas was attractive to most students, whereas activities involving divergent thinking were appealing to even more of the high ability students.

Expert Knowledge (α = .77; 3 of 7 items). Three items involving experts and their knowledge achieved practical significance. More than half of the students in both groups were eager to hear experts in their favorite subjects and learn what they know. "Understanding things the way experts do" was important to 12.8% more of the SIG than SNIG (67.8% SIG vs. 55% SNIG). This desire for authenticity arose earlier

in the "Curriculum Content" category. It was also a central theme in the "Curriculum of Practice," one of the "four 'parallel' ways of thinking about course content" recommended by the National Association of Gifted Children (Tomlinson et al., 2001, p. 17).

Interaction with experts and authentic knowledge that brought life to students' favorite disciplines was popular with both groups. Opportunities to "shadow" professionals, engage in internships or cooperative learning experiences, work with mentors, and interact with guest speakers would give all class members to access these experiences. Students' interactions with experts can be differentiated to ensure they interact in ways and at levels matched to their abilities and interests.

Teacher/Student Relationship (α = .69; 3 of 9 items). Two of the three items evoking significant frequencies make it clear that caring, encouraging teachers were important to students in both groups. Kanevsky and Keighley (2003) found that one of the factors contributing to the academic deterioration of nonproducing SIG was teachers who showed little concern for their students. Teachers can be proactive, offering support and showing interest in students' progress. Systematically asking for students' learning preferences *and* integrating their wishes into curriculum planning would be a noteworthy act of what those students consider to be a caring teacher.

In the third item achieving significance, 17.1% more SIG indicated they did not enjoy asking teachers for assistance (49.6% SIG vs. 32.5% SNIG). A number of possibilities might have contributed to this finding. One may be that more of the SIG believed they would be judged and found lacking if they sought help. This interpretation is consistent with what Dweck (2006, 2009) described as a "fixed" mind-set, the belief that intelligence is a fixed trait set at birth. In contrast, individuals with a "growth" mind-set believe their intelligence is a "malleable quality that can be developed" (Dweck, 2009, p. 308). Dweck's research has shown that

> . . . holding a fixed mindset makes students overly concerned with how smart they are, and leads them to avoid challenges, devalue effort and under-perform in the face of difficulty. In contrast, holding a growth mindset makes students more concerned with learning (rather than looking smart) and leads them to seek challenges, value effort, and shine in the face of difficulty. (p. 308)

She has expressed a concern that the label "gifted" suggests giftedness is a stable, fixed trait and that SIG with fixed mind-sets believe intellectual excellence should be effortless. When challenged by a difficult task, they may not want to seek help because they are "petrified that they will be found to be unintelligent" (p. 315), disappointing themselves and others, feeling undeserving of the label.

It is also possible that some of the SIG who had growth mindsets may not have liked asking for help but for a very different reason: because they enjoyed the challenge of not knowing and the sense of sole ownership of their accomplishment involved in making sense of difficult, unfamiliar material—if they did it on their own. This could be related to effectance motivation (mentioned earlier in the "Choice" category), the desire for challenge and independent problem solving (Pearlman, 1984). Kanevsky (1992) reported early evidence of this behavior in the learning of 4- to 8-year-old gifted children who would reject offers of assistance when struggling to solve difficult problems. They preferred to do it themselves but appreciated knowing support was available.

Like the SNIG, SIG wanted to be understood by their teachers. Although many do not like asking for help, support should be available. We still have much to learn about the nature, source and timing of optimal assistance.

Sharing Learning (α = .78; 4 of 10 items). More than 60% of students in both groups were eager to share their learning with family members but not with classes of older students. Classmates or adults outside of school were also unpopular audiences, but slightly less than older students. Nearly 10% more of the SNIG indicated that they did not want to share their learning with classmates or adults outside of school. It appears that the audience mattered to students; they wanted to share their accomplishments but preferred to keep it "in the family" where the audience and expectations were understood. They may have felt safer and relationships with age mates were not at stake. It may also be that students wished to avoid presenting to classmates, older schoolmates, or strangers, to avoid negative social consequences, such as embarrassment or insults.

Relationships were a cross-categorical theme, overlapping with Collaborative Learning, Open-endedness, and Teacher/Student Relationships as well as influencing students' willingness to disseminate the outcomes of their learning. Teachers should consider potential audiences carefully and involve students in choosing audiences as this feature of curriculum evoked strong responses from many students.

Additional Finding

While completing the PFL survey and before rating one or more items on it, a noticeable number of participants expressed the same concern. They would raise a hand and say, "It depends . . .," indicating their rating would depend on aspects of the activity beyond those specified in the item, for example, the specific topic, level of difficulty, workmates, time constraints, assessment procedures, and criteria. Although the students had been directed to focus their ratings on their favorite subject, many sought further details of the learning experiences in which these options would be offered. This highlights the sensitivity and complexity of learning preferences.

Limitations

The results of any study relying on self-report data are always susceptible to response bias, such as a "halo effect," that is, it is possible the students may have rated items in ways that they hoped would please their teachers, particularly

when their teacher administered the survey. The reliance on descriptive statistics prevents generalizing these findings to the broad population of learners who have been identified as gifted; however, the resonance of the findings reported here with those of other studies in which teachers were not involved in data collection suggests that response bias has been minimized and the percentages have captured consistencies with previous research.

Although these findings are limited to an ability-related group comparison, research literature has made it clear that intellectual ability is not alone in its influence on students' learning preferences. Characteristics other than the abilities that gained gifted students' entrance into special programs (the operational definition of gifted in this study) also influence the ways they like to learn. It must be remembered that age (Chan, 2001), gender (Li & Adamson, 1992; Li & Bourque, 1987; Ristow et al., 1985), and cultural background (Ewing & Yong, 1992; Yong & McIntyre, 1992), are also potential influences. It is possible that the five-grade span of participants may have included some age-related trends in preferences that were not investigated in this analysis. As mentioned earlier, familiarity with the practices mentioned in the items may have influenced students' ratings. The students who had been identified gifted and attended special programming may have had more experience (positive or negative) with some of the forms of differentiation on the survey than nonparticipants. It is also possible that differences in the nature of the programs in the Canadian and American school districts may have influenced ratings as well. Hence, it must be remembered that differences in ability provide a valuable, but limited, perspective on learning preferences. Future investigations must be undertaken that consider a range of individual difference variables concurrently, for example, abilities, interest, gender, age, culture, and familiarity.

The comparative design of this study was not intended to perpetuate ability-related stereotypes of SIG. Instead it highlights the nature and extent of the differences and similarities in these SIG and SNIG. In fact, the groups' ratings were more similar than different on 75% items that were most popular. This indicates these groups had a great deal in common with regard to their learning preferences. It does not mean that they will experience equivalent learning outcomes when their preferences are implemented. "Aptitude-treatment interactions" may be expected in academic, social, and motivational outcomes of learning in the ZPD. Future studies must determine the qualitative and quantitative differences in learning that arise from experiences in which students' preferences are and are not considered. Further work must also be done to strengthen the psychometric properties of the PFL if it is to be used in future studies.

Conclusion

Maker and her colleagues (Maker, 1982; Maker & Nielson, 1995; Maker & Schiever, 2010) proposed a collection of principles to guide the design of curriculum for learners with high abilities; however, in this study, most of the principles, in some form, had the support of the students who had not been identified as gifted as well. When studying in their favorite subject, a large majority of students in both groups shared a desire to control the pace of their learning, the topics, methods and choice of workmates. They did not enjoy learning when they felt pressured to catch up after an absence, or had to work with quicker peers; they did not want to sit alone or present their new knowledge to older students.

Some features, however, were more attractive to significantly more of the students identified as gifted than those who were not. More of the students who had been identified wanted to learn about complex, extracurricular topics and authentic, sophisticated knowledge and the interconnections among ideas. More also wanted to work with others *some of the time*, but fewer wanted to sit alone. Choosing the format of their learning products was also appealing to more of the students identified as gifted. It was not surprising that more of them did not like waiting for new material while their classmates learn what they already knew and they did not enjoy asking for help.

In summary,

1. The groups differed primarily in the relative popularity of the same features of learning activities; they did not prefer different features. Therefore, it can be said that their preferences differed in degree rather than kind.
2. Most students in this study, identified as gifted or not, supported the principles of curriculum differentiation recommended by Maker and her colleagues. In these ways their preferences are more alike than different. This does not, however, mean they should be offered the same curriculum, that is, the same activities with the same materials, in the same time frame, and assessed with the same criteria and procedures. These principles can be applied to curriculum for all students; however, it must be implemented in a manner that is sensitive to the learners' readiness, interest, learning profile, and social and affective needs.
3. When the learning preferences of students identified as gifted differed from those who had not been identified, they differed in ways consistent with the cognitive characteristics that often distinguish the groups in the literature. For example, because most individuals who have been identified as gifted think in more complex ways and are faster learners than their peers, it was not surprising that more disliked waiting for others to catch up and wanted to learn with students who matched their pace in order to maintain a motivating, developmentally appropriate level of challenge.
4. The choice-related findings make it clear most students want to have a voice in what and how they

> learn, and that their preferences are likely to be influenced by a number of factors (e.g., who they work with, time constraints, assessment criteria and procedures).

In classrooms, the individual is the most appropriate unit of analysis for differentiating curriculum. The best practice is to assess and respond to each student's learning preferences rather than applying the outcomes of this study to nonparticipants. Students' preferences can be explored in systematic, formal ways with surveys such as the PFL, or pursued informally in conversation. Although the volume of information generated may seem daunting, particularly to secondary teachers who see more than 100 students each day, teachers can take comfort in the results of this study. The substantial commonalities found in the preferences of the 600+ participants enables the options for differentiation to be prioritized by popularity and reduced to a manageable few, making this endeavor much more feasible and attractive. For example, self-pacing and choice options would be good starting points for students in this study.

Teachers cannot and should not constantly cater to students' preferences. Students also need to learn in ways that are not of their choosing. They need to develop a broad repertoire of learning strategies, including some they don't like, that they can draw on in the future; they need to develop the self-management skills involved in persisting when tasks are not to their liking; and they need to learn to understand and accommodate the preferences of others. In the process of learning in ways they don't think they like, they may discover some they enjoy more than they expected. All learners' preferences can seldom be accommodated in one lesson but can be addressed over time.

Each group of teachers and students can find a balance between what students want and need, and the fulcrum can move gradually toward greater student control over time. Kohn (1993) identified the reciprocity involved in this process almost 20 years ago. He pointed out that the power differentials in today's classrooms favors teachers and it must shift if we are committed to having students take greater responsibility for their learning. He felt that teachers must relinquish control a degree of control to students, offering them responsibility for their learning, before they can take it.

Reciprocal relationships and caring are keys to successful deferential differentiation and effective collaboration in the ZPD. From a Vygotskian theoretical perspective, Levykh (2008) concluded,

> . . . the dynamic process of establishing and maintaining the ZPD is successful only when emotionally laden reciprocal relations between the learner and the instructor allow for participants' comfort and trust, which are manifested in constant negotiation of the subject of inquiry and the way it is presented and acquired (p. 97).

Follow-up studies will be essential to determine the effects of implementing students' preferences for learning in the ways recommended Maker's principles. The effects of self-determination and curriculum differentiation may be greatest when students are working in their areas of greatest interest and passion, however this hypothesis also requires direct investigation.

Students come to school to learn more than just subject matter; they come to learn to be learners. Providing opportunities for students to become aware of and communicating their learning preferences will enable students to participate in deferential differentiation and to develop the self-knowledge that is essential to effective, autonomous, lifelong learning.

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Bio

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