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## Secondary School Experiences of Students With Autism

Autism is recognized to be a “complex disorder” as well as “a spectrum of disorders” that includes Asperger’s syndrome and pervasive developmental disorders (Seltzer et al. 2004, p. 234). Diagnostic criteria for autism focus on impairments affecting socialization, verbal and nonverbal communication, and restricted and repetitive patterns of behavior (Filipek et al. 2000; Lord and McGee 2001). The number of students diagnosed with autism has been increasing over time (Volkmar et al. 2004); almost 194,000 students ages 6 through 21 nationwide are identified as having autism and receive special education services under the Individuals with Disabilities Education Act (IDEA) (U.S. Department of Education 2006a).

Despite the increase in this population and the challenges they pose for schools, few studies have focused on the educational attainments of youth with autism (Seltzer et al. 2004). Little is known about what these students experience in high school classrooms. At the national level, information on the classroom experiences of secondary students with autism has been limited to data on where students are educated—whether classes are taken in general education or special education settings (U.S. Department of Education 2006b).

This fact sheet provides a national picture of the secondary school experiences of students with autism who received special education services under the auspices of school districts, by addressing the following questions: What is the pattern of course taking of secondary-school-age students with autism and in what settings are courses taken? What are the characteristics of classroom instruction provided to students with autism, and how do they differ in general, vocational, and special education classes? What types of accommodations, services, and supports do schools provide to students with autism?

These questions are addressed by using data collected from school staff during Wave 1 of The National Longitudinal Transition Study-2 (NLTS2).<sup>1</sup> Mail surveys were conducted with staff in the schools attended by NLTS2 sample members in the spring of the 2001-02 school year—students were 14 through 18 years old at the time.<sup>2</sup> School staff who were knowledgeable about students' overall school programs and about their special and vocational education courses were surveyed.<sup>3</sup> In addition, for NLTS2 sample members who were reported by school staff to be enrolled in at least one general education academic class, teachers of the first such class in each student's school week were surveyed.<sup>4</sup> These data offer a national perspective<sup>5</sup> on the secondary school experiences of students with autism who received special education services from or through their school districts when they were sampled in 2000.

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<sup>1</sup> The National Longitudinal Transition Study-2 (NLTS2), being conducted by SRI International for the U.S. Department of Education, has a nationally representative sample of more than 11,000 students who were in at least seventh grade and receiving special education services in the 2000-01 school year. NLTS2 students were chosen from rosters of students receiving special education from or through public school districts. Districts were instructed to include all students for whom they were responsible, regardless of where they went to school or the type of school attended (e.g., a residential school in another state). Approximately 1,000 youth with autism are included in the sample. This sample is designed to represent a total of 1,838,848 youth with disabilities and 14,637 youth with autism, according to federal child count figures (U.S. Department of Education 2002). See [www.nlts2.org](http://www.nlts2.org) for more information about the study.

<sup>2</sup> Most of the data presented in this fact sheet also are included in Wagner, Newman et al. (2003) and Levine, Marder, and Wagner (2004).

<sup>3</sup> This survey is referred to as the student's school program survey.

<sup>4</sup> This survey is referred to as the general education teacher survey.

<sup>5</sup> Data reported here are population estimates from data weighted to represent students in the autism category who attended school in the kinds of districts from which they were sampled.

The terminology for classifying students with autism that is used here is guided by federal regulations for the implementation of the Individuals with Disabilities Education Act Amendments of 1997 (P.L. 105-17; Knoblauch and Sorenson 1998). Students included in this category were identified by their school districts as having autism as a primary disability. Criteria for identification as a student with autism differ from state to state (Mandell and Palmer 2005), resulting in wide variation among students in the autism disability category. For example, in regard to communication abilities, 13 percent of students with autism experience no trouble communicating with others, 31 percent have little trouble conversing, 38 percent have a lot of trouble, and 18 percent are unable to communicate at all (Wagner, Levine et al. 2003).<sup>6</sup> The variation in criteria used and the resulting variation in the ability of students included in the autism category suggest that this category includes those identified with autism spectrum disorder (ASD) and conditions such as Asperger Syndrome and pervasive developmental disorder.

## Statement of Purpose

The purpose of this fact sheet is to provide a relatively brief description of the secondary school experiences<sup>7</sup> of students with autism as a group. It does not go into detail in analyzing variations in experiences as they differ by levels of functioning, for example, nor does it compare the experiences of youth in the autism category with students in other disability categories

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<sup>6</sup> See Wagner, Levine et al. (2003) for further discussion of functional differences among those categorized in the autism disability category.

<sup>7</sup> See Newman (2005) for discussion of family involvement in the educational development of students with autism, and Cameto, Levine, and Wagner (2004) for a discussion of activities related to transition planning for students with autism.

or in the general population, (although there are some comparisons between teacher-reported classroom experiences of students with autism and their classmates). For comparisons with the general population of youth ages 14 through 18, see the NLTS2 report, *Going to School: Instructional Contexts, Programs and Participation of Secondary School Students with Disabilities* (Wagner, Newman et al. 2003). It also is important to note that this fact sheet does not address questions regarding the appropriateness of particular experiences or school practices for students with autism, nor is there an intention to imply causality from the data presented in this fact sheet.

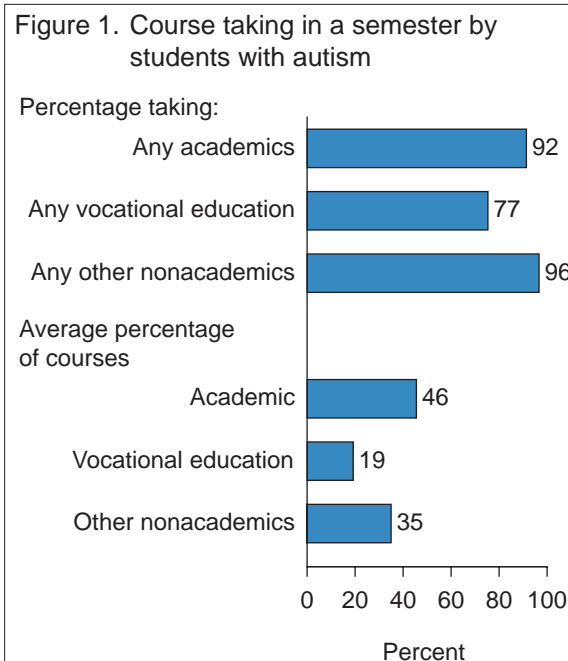
## Students' Course Taking

Most secondary school students with autism under the auspices of school districts attend public schools (97 percent).<sup>8</sup> Overall, more than 4 out of 5 (84 percent) attend regular schools that serve a wide variety of students, and about 12 percent attend special schools that serve only students with disabilities. The other 4 percent attend charter, magnet, alternative, hospital, or home schools. Among 14- through 18-year-olds with autism, almost 10 percent attend middle or junior high schools, and 75 percent attend high schools. Multilevel schools (e.g., kindergarten through 12th grade) are attended by about 15 percent of students with autism. The relatively small proportion of students with disabilities

<sup>8</sup> NLTS2 students were chosen from rosters of students receiving special education from or through public school districts. Although districts were instructed to include all students for whom they were responsible in the rosters they provided for NLTS2 regardless of where the students went to school or the types of schools attended (e.g. private schools; see footnote 1), it is possible that districts underreported students served in non-public-school placements, thereby increasing the proportion of students reported to be attending public schools.

attending middle schools means that, for the most part, the findings in this fact sheet represent the experiences of students with autism in high schools.

More than 9 out of 10 secondary students with autism (92 percent) take at least one academic subject in a given semester<sup>9</sup> (figure 1). Most take language arts (89 percent) and mathematics (90 percent); somewhat fewer take social studies (69 percent) or science (67 percent). A foreign language is taken less often than other kinds of academic courses, with 12 percent of secondary students with autism enrolled in a foreign language course. Academic courses account for almost half (46 percent) of the courses students with autism take in a given semester, on average.



SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Special Education Research, National Longitudinal Transition Study-2 (NLTS2), Wave 1 student's school program survey, 2002.

<sup>9</sup> One purpose of the student's school program survey was to obtain a snapshot of each student's school program in terms of the range of courses taken at the time and the setting for each of these courses. Data reported here are for the student's spring 2002 courses.

Many students with autism (77 percent) also take vocational education courses in a given semester. Enrollment in occupationally specific vocational education is about equally likely as enrollment in prevocational education (61 percent of vocational education students take each kind of course). Vocational education courses account for 19 percent of the courses students with autism take in a given semester, or approximately one course in a student's course schedule.

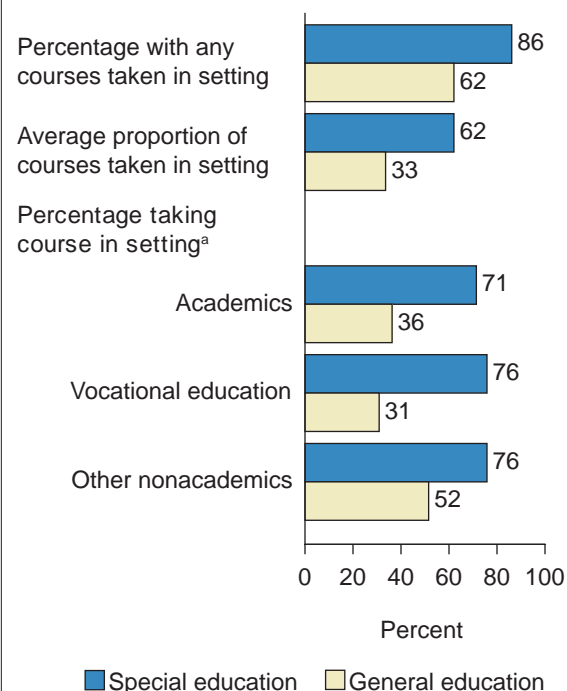
Nonacademic courses other than vocational education are included among the courses taken by 96 percent of secondary school students with autism. Approximately three-quarters (74 percent) are enrolled in physical education, 71 percent take life skills courses, 63 percent take fine arts courses, and approximately one-third (35 percent) are enrolled in study skills courses. On average, these courses make up 35 percent of the kinds of courses taken by students with autism in a given semester.

## Instructional Settings

Most students with autism take classes in both general and special education settings, although they are more likely to take courses in a special than a general education setting (figure 2). Sixty-two percent take at least one general education course in a given semester, whereas 86 percent take at least one course in a special education setting, ( $p < .001$ ).<sup>10</sup> On average, general

<sup>10</sup> Testing for the significance of differences in responses to two survey items for the same individuals involves identifying for each youth the response to the two items. Responses to each item (e.g., taking at least one course in a special education setting compared with taking at least one course in a general education setting) are scored as 0 or 1. The difference between these scores produces values for individual students of +1 (responded affirmatively to the first item but not the second), 0 (responded affirmatively to both or neither item), or -1 (responded affirmatively to the second item but not the first). The test statistic for the null hypothesis of a mean

Figure 2. Course taking in a semester by students with autism, by instructional setting



<sup>a</sup>Includes only students with autism taking the kind of course specified.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Special Education Research, National Longitudinal Transition Study-2 (NLTS2), Wave 1 student's school program survey, 2002.

education courses make up one-third of the kinds of courses students with autism take, and special education courses comprise 62 percent.

Secondary school students with autism are more likely to take nonacademic courses other than vocational education (e.g., physical education, study skills) in a general education setting (52 percent) than to take academic (36 percent,  $p < .001$ ) or vocational courses (31 percent,  $p < .001$ ) in this type of setting.

of zero for the difference score is the square of a ratio, where the numerator of the ratio is the weighted mean change score and the denominator is an estimate of the standard error of that mean. Since the ratio approaches a normal distribution by the Central Limit Theorem, and sample sizes are at least 30, this test statistic approximately follows a chi-square distribution with one degree of freedom (i.e., an  $F(1, \text{infinity})$  distribution).

## Experiences in General Education Academic Classes

Secondary school students with autism study a range of academic subjects in general education settings, including foreign language, social studies, science, mathematics, and language arts. Of those who take these types of classes, enrollment in a general education setting is more likely for foreign language (83 percent) than for social studies (41 percent,  $p < .05$ ), science (39 percent,  $p < .05$ ), language arts (30 percent,  $p < .01$ ), or mathematics (27 percent,  $p < .01$ ). Enrollment in a general education class is more likely for social studies than for mathematics ( $p < .01$ ), and general education enrollment is more likely for science than for mathematics ( $p < .01$ ).

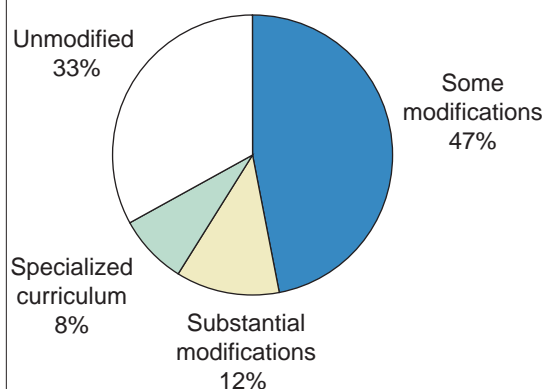
### ***Instructional Practices in General Education Academic Classes***

To understand the instructional experiences of students with autism in general education academic classes, teachers were asked to report the frequency with which they used various practices with a specific student with autism and with their class as a whole.<sup>11</sup>

***Access to the general education curriculum.*** General education academic teachers often modify their course curriculum to accommodate the individual learning needs of the students with disabilities in their classes. Teachers were asked to indicate the extent of such

modifications to the general education curriculum for individual students with autism in their classes. Overall, one-third (33 percent) of secondary school students with autism receive the standard general education grade-level curriculum used for other students in their general education academic classes (figure 3). However, almost half of students with autism (47 percent) have teachers who report making “some modifications” to the general education curriculum. For another 12 percent, “substantial modifications” are made to the general education curriculum they receive, and 8 percent receive a specialized curriculum.

Figure 3. Extent of curriculum modification for students with autism in general education academic classes



SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Special Education Research, National Longitudinal Transition Study-2 (NLTS2), Wave 1 general education teacher survey, 2002.

***Instructional groupings.*** Students with autism are in general education academic classes that have an average of 22 students per adult. Considerable research suggests that low student/teacher ratios help teachers meet student needs by facilitating effective instruction, communication, and individualization (Achilles and Finn 2000; Gersten and Dimino 2001; Thurlow,

<sup>11</sup> A typical general education academic class includes 19 general education students and 5 students who receive special education services. Thus, the comparisons made in this section should not be construed as between students with disabilities and nondisabled students. Rather, teachers reported on the classroom experiences of specific students with disabilities and compared them with those of the other students in class, including any other students with disabilities.



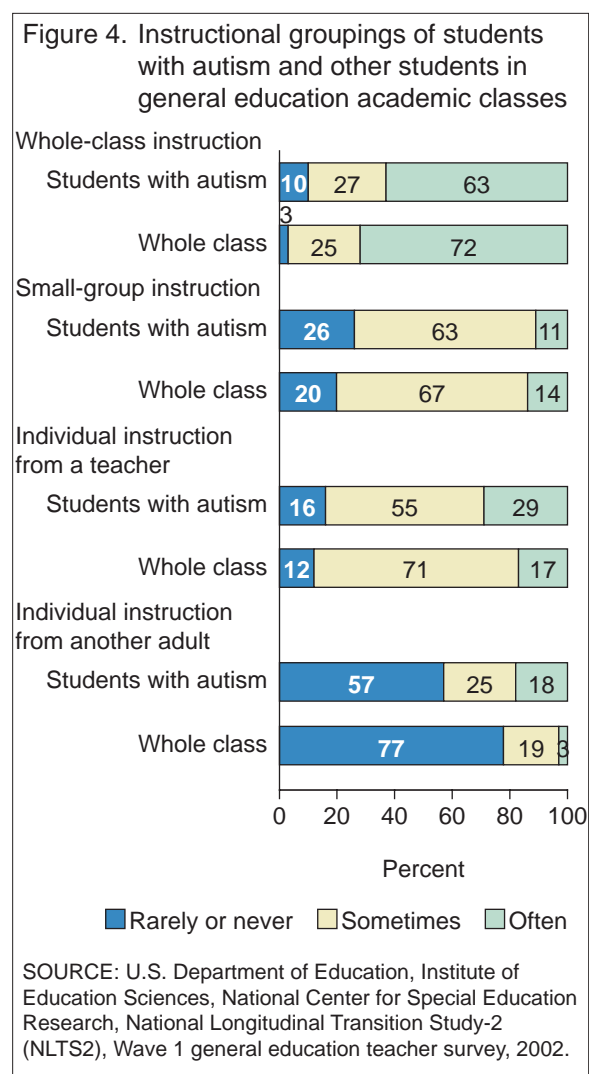
Ysseldyke, and Wotruba 1989). Instructional strategies, such as using small-group or individual instruction, can be used to help reduce the student/teacher ratio for some classroom instruction.

Students with autism, as well as their classmates as a whole, experience whole-class instruction more frequently than other instructional groupings; 63 percent of students with autism are reported by teachers to experience whole-class instruction “often,” and 72 percent have teachers who report that their classmates receive whole-class instruction “often” (figure 4). Students with autism differ from their class peers in the amount of individual

instruction received from an adult other than the classroom teacher (e.g., a special education teacher or an aide). They are six times as likely as the class as a whole to receive instruction “often” from an adult other than the general education teacher (18 percent vs. 3 percent,  $p < .001$ ).

*Instructional materials and instructional activities outside the classroom.* Textbooks, worksheets, and workbooks are the most frequently used instructional materials in general education academic classes in which secondary students with autism are enrolled. Teachers of students with autism report similar frequencies of using print material for students with autism and for their classmates (82 percent and 85 percent of the two groups, respectively, are reported to use print materials frequently).

Computers can provide important instructional supports, including being used for academic drills, word processing or spreadsheet activities, and access to the Internet. Although 98 percent of students with disabilities attend schools that report having computers in at least some academic classes (Newman, Marder, and Wagner 2003), many teachers of general education academic classes report that students “rarely” or “never” use computers in their classes, with no statistically significant difference in frequency of use by students with autism and the class as a whole. Less than 20 percent of students with autism “often” use computers in these classes for any purpose. Computers are the least likely to be used for academic drills, with three-quarters (74 percent) of students with autism “rarely” or “never” using computers for this purpose; almost half (45 percent) “rarely” or “never” use classroom computers for word processing ( $p < .001$  for drills comparison) or for accessing the Internet ( $p < .001$  for drills comparison).

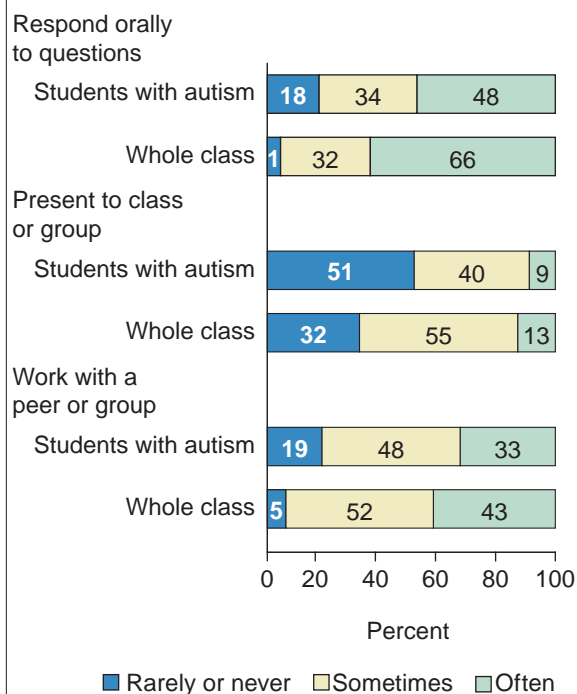


Instruction does not occur only within the confines of a classroom; teachers can offer students opportunities to extend their learning through the use of libraries, computer labs, or other types of resources at the school, as well as through field trips off campus and through community-based instruction or experiences, such as service-learning projects. However, these types of experiences occur infrequently as part of general education academic classes that include students with autism. Similar to many other teacher-directed aspects of the class, students with autism do not differ from classmates in their participation in activities outside the classroom. Teachers report that two-thirds of both groups “rarely” or “never” go on field trips, and approximately 90 percent of the two groups “rarely” or “never” have community-based instruction or experiences.

### ***Students’ Participation in General Education Classroom Activities***

In contrast to most teacher-directed aspects of the class, such as materials used, field trips, and visits to a computer lab, the classroom participation of students with autism in general education academic classes differs from the participation of students in their class as a whole (figure 5). Teachers report that students with autism participate less actively than other students in their general education classes. For example, 48 percent of students with autism are reported by teachers to respond orally to questions “often,” whereas 66 percent are in classes in which their classmates “often” respond orally to questions ( $p < .01$ ). Almost one in five (18 percent) of students with autism are reported “rarely” or “never” to respond orally to questions, whereas only 1 percent are in classes in which their classmates are reported to respond orally to questions as infrequently ( $p < .01$ ). Half of

Figure 5. Participation of students with autism and other students in general education academic classes



SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Special Education Research, National Longitudinal Transition Study-2 (NLTS2), Wave 1 general education teacher survey, 2002.

students with autism are reported “rarely” or “never” to present to the class, compared with about one-third (32 percent,  $p < .001$ ) whose teachers report that classmates respond as infrequently, and 19 percent “rarely” or “never” work with a peer partner or group, compared with 5 percent whose classmates do so as infrequently ( $p < .001$ ).

### ***General Education Academic Teachers’ Perceptions and Expectations***

Although their participation in general education academic classes differs somewhat from that of their peers, 63 percent of secondary school students with autism who take general education academic classes have teachers who consider their placement in those classes to be “very

appropriate”; most of the rest (29 percent) are considered to have “somewhat appropriate” placements. However, the participation of 9 percent of students with autism in general education academic classes is considered “not very appropriate” or “not at all appropriate” by their general education teachers.

Almost 9 out of 10 students with autism (89 percent) in general education academic classes are expected by their teachers to keep up with others in their class; however, approximately three-fourths (76 percent) are reported by their teachers to do so.

## Experiences in General Education Vocational Classes

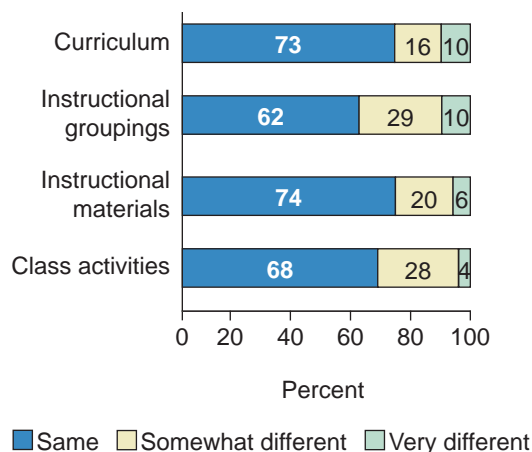
Vocational education plays an important role in the secondary education of students with autism; more than three-quarters (77 percent) take a vocational education course in a given semester. This section focuses on the experiences of secondary students with autism in general education vocational classes.<sup>12</sup>

### *Instructional Practices in General Education Vocational Classes*

General education vocational teachers were asked to report the extent to which the classroom instructional experiences of secondary students with autism are the same as or different from those of the

class as a whole.<sup>13</sup> Many students with autism in general education vocational classes experience the same instructional practices as the class as a whole (figure 6). Approximately three-fourths (73 percent) are exposed to the same curriculum and use the same instructional materials, such as textbooks, computers, and tools (74 percent), as their classmates. About two-thirds (68 percent) participate in the same class activities, such as hands-on work, projects, and field trips, and 62 percent receive their education in the same instructional groupings (i.e., whole-class, in small groups, with partners, or individually) as others in their general vocational education classes.

Figure 6. Comparison of instructional experiences of students with autism and students in general education vocational classes as a whole



SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Special Education Research, National Longitudinal Transition Study-2 (NLTS2), Wave 1 student's school program survey, 2002.

<sup>12</sup> Of those students with autism who take vocational classes, 69 percent take a vocational class in a special education setting, and 31 percent do so in a general education setting. This section focuses on experiences in general education vocational courses. Information about students' vocational education classes was provided by school staff responding to the Wave 1 NLTS2 student's school program survey. If vocational courses were taken in general education settings, school staff respondents were asked to obtain information about the class from the general education vocational teacher; additional information was not collected for students in vocational courses in special education settings.

<sup>13</sup> The experiences of specific individual students with disabilities are compared with those of the students in their general education vocational class as a whole. These classes include 18 general education students and 4 students with disabilities, on average. Therefore, the comparison is not between students with autism and students without disabilities, but between individual students with autism and all other students in the class.



Instructional experiences for 16 percent to 29 percent of students with autism differ “somewhat” from those of the class as a whole. For 10 percent or fewer of students with autism, curriculum, instructional groupings, instructional materials, and class activities are “very different” from those of their classroom peers.

### ***General Education Vocational Teachers’ Perceptions and Expectations***

Four out of five students with autism (80 percent) who take general education vocational classes have teachers who consider their placement in those classes to be “very appropriate”; the majority of the remaining students (19 percent) are considered to have “somewhat appropriate” placements. The participation of only 1 percent of students with autism in general education vocational classes is considered “not very appropriate” or “not at all appropriate” by their teachers.

Approximately 80 percent of students with autism in general education vocational classes are expected by their teachers to keep up with others in their class; 81 percent are reported by their teachers to do so.

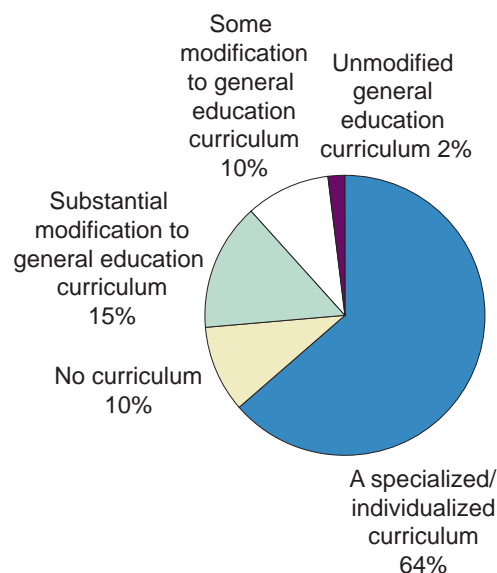
### **Experiences in Nonvocational Special Education Classes**

Almost 9 out of 10 secondary students with autism take at least one course in a special education setting in a semester. Information presented in this section focuses on nonvocational special education classes, that is, classes that focus on academic subjects (i.e., math, science, language arts); study skills, in which students receive help with homework and learn successful studying and test-taking strategies; and functional life skills that facilitate independent living.

### ***Instructional Practices in Nonvocational Special Education Classes***

The use of a general education curriculum without modification is rare in a nonvocational special education class, with 2 percent of secondary students with autism in such classes receiving an unmodified curriculum (figure 7). One out of 10 are reported to have a general education curriculum with “some modifications,” and 15 percent have a “substantially modified” curriculum in their special education class. Almost two-thirds (64 percent) receive a specialized or individualized curriculum, and 10 percent have no curriculum.

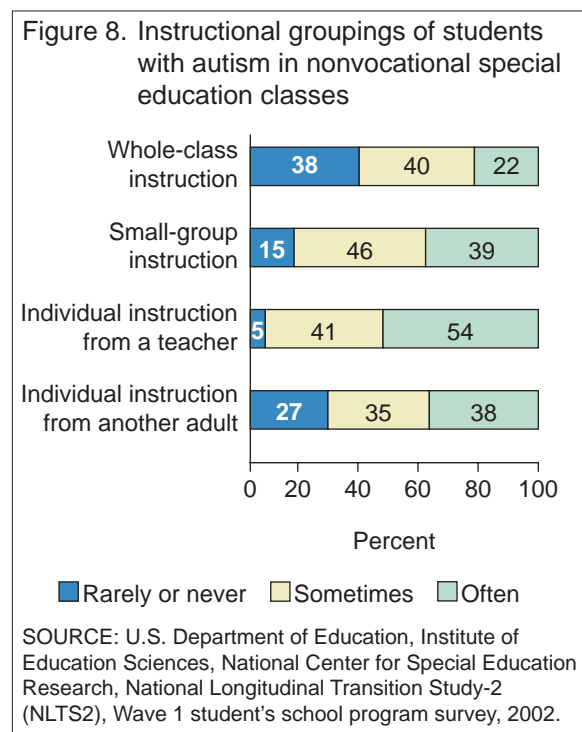
Figure 7. Extent of curriculum modification for students with autism in nonvocational special education classes



SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Special Education Research, National Longitudinal Transition Study-2 (NLTS2), Wave 1 student’s school program survey, 2002.

***Instructional groupings.*** Nonvocational special education classes tend to have low student/adult ratios; on average, there are 3 students per adult, compared

with 22 students per adult in general education academic classes ( $p < .001$ ). Although students with autism experience a mix of instructional groupings in special education classes (figure 8), they are more likely to receive individual instruction from an adult (38 percent) and small-group instruction (39 percent) “often” in special education than in general education classes (29 percent, 18 percent, and 11 percent, respectively,  $p < .05$  and  $p < .01$ , respectively). In contrast, whole-class instruction is less common in special education than in general education classes, with less than one-quarter (22 percent) of students with autism in special education classes “often” receiving whole-class instruction, compared with 63 percent of those in general education classes ( $p < .001$ ).



*Instructional materials and instructional activities outside the classroom.* A variety of materials and equipment are used in nonvocational special education classes.

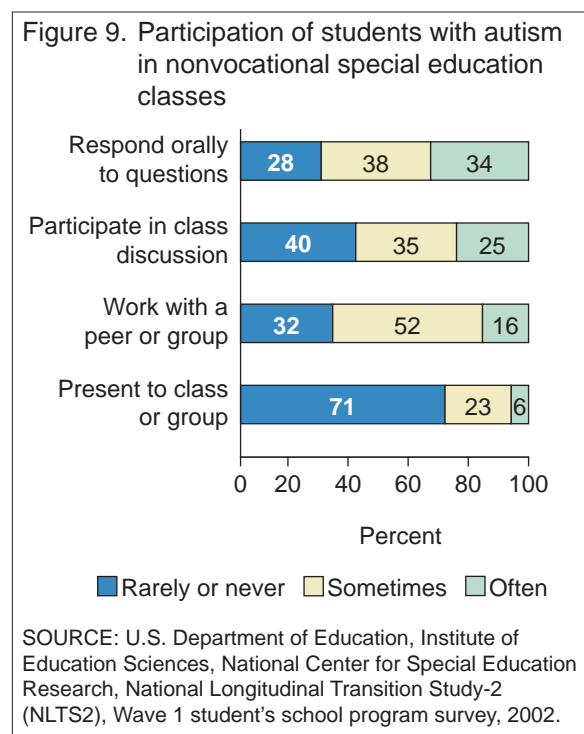
Textbooks, workbooks, or worksheets are reported to be used “often” for 41 percent of students with autism in special education classes. Slightly more than one-third (35 percent) “often” use life-skills materials, and one-quarter are in classes where they “often” use instructional games and toys. Computers are not frequently used for any purpose in special education classes; less than one out of five students with autism are in special education classes in which they use computers “often” for skills practice, word processing, or other applications, or to access the Internet.

For about half (47 percent) of students with autism in nonvocational special education classes, classroom instruction is augmented with instructional activities that occur outside the classroom, such as going to the library or working on a project in the school media center. Activities that take place in the community (e.g., riding a bus, visiting a grocery store) are experienced “often” by 40 percent of students with autism, and 25 percent “often” go on field trips. Each of these activities occurs more frequently in special education than in general education classes, where 23 percent “often” participate in out-of-classroom school-based activities ( $p < .05$ ), 4 percent “often” participate in community-based experiences ( $p < .01$ ), and 5 percent “often” go on field trips ( $p < .01$ ).

### ***Students' Participation in Nonvocational Special Education Classroom Activities***

Teachers of nonvocational special education classes were asked to report the frequency with which students with autism participate in class discussions, respond orally to questions, present to a class or group, and work with a peer or group. More than half of those with autism participate

in each activity at least “sometimes,” with the exception of presenting in front of a class or group; 71 percent “rarely” or “never” present (figure 9). More than one-third (34 percent) “often” respond orally to questions during class. Although one-quarter participate in class discussions frequently, 40 percent do not participate even “sometimes.” Less than 1 out of 5 (16 percent) “often” work with a peer partner or group. Students with autism in nonvocational special education classes are less likely than students with autism in general education academic classes to work with a partner or group “often” ( $p < .001$ ).



## Accommodations, Services, and Supports Provided to Students With Autism

Some youth, particularly those with disabilities, need supports and interventions beyond the traditional classroom experiences to be successful at school (Tindal and Fuchs 2000). Secondary-school-age students with

autism began receiving services as young children; parents report that, on average, youth were 4 years old when they first received disability-related services from a professional (Wagner, Newman et al. 2003). By the time they are in secondary school, according to teachers, 97 percent of students with autism receive some type of accommodation or modification, learning support, technology aid, or related service to enhance their performance in school.

More than 9 out of 10 secondary students with autism (91 percent) receive accommodations and modifications. Additional time to complete assignments (52 percent) or tests (52 percent) are among the more frequent types of accommodations (table 1). Tests and assignments also

**Table 1. Accommodations and modifications provided to students with autism**

Accommodation	Percent
Any type of accommodation or support <sup>a</sup>	91
Additional time to complete assignments	52
More time in taking tests	52
Alternative tests or assessments	49
Slower-paced instruction	41
Shorter or different assignments	38
Modified tests	33
Modified grading standards	30
Tests read to student	25
Modifications to physical aspects of the classroom	16

<sup>a</sup> This includes receipt of any of the accommodations and other learning supports listed here and in tables 2 and 3. Students may receive more than one kind of accommodation, support, or learning aid.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Special Education Research, National Longitudinal Transition Study-2 (NLTS2), Wave 1 student's school program survey, 2002.

are modified; 49 percent of secondary students with autism receive alternative tests, 33 percent are given modified tests, 25 percent have tests read to them, and 38 percent are given shorter or different assignments than the rest of the class. Approximately 2 out of 5 (41 percent) receive slower-paced instruction. Almost one-third (30 percent) have teachers who modify grading criteria. Physical aspects of the classroom are modified for 16 percent of students with autism.

More than 80 percent of students with autism also receive other types of supports or assistance to enhance their participation and performance (table 2). Instructional support is often provided through monitoring of students' progress by special education teachers; 57 percent of students with autism receive this support. More than half (55 percent) of students with autism receive help from teacher aides, instructional

assistants, or personal aides. Approximately one-third (32 percent) receive more frequent feedback from teachers, and 22 percent receive help with learning strategies or study skills. Less than 15 percent receive assistance from peer tutors, tutoring help from an adult, support from readers or interpreters, or self-advocacy training.

Technology aids are provided to 57 percent of students with autism. More than one-quarter (28 percent) use a calculator in the classroom when other students are not permitted to use one, and 16 percent use a computer for activities in which one is not allowed for other students (table 3). Approximately one out of four (23 percent) use computer software specifically designed for students with disabilities, and 16 percent use communication aids. Books on tape and specialized computer hardware each are used by 8 percent of students with autism.

Table 2. Learning supports provided to students with autism

Learning support	Percent
Some type of learning support	81
Monitoring of progress by special education teacher	57
A teacher's aide, instructional assistant, or other personal aide	55
More frequent feedback	32
Learning strategies/study skills assistance	22
A peer tutor	14
Self-advocacy training	13
Tutoring by an adult	9
A reader or interpreter	6

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Special Education Research, National Longitudinal Transition Study-2 (NLTS2), Wave 1 student's school program survey, 2002.

Table 3. Technology aids provided to students with autism

Technology aid	Percent
Some type of technology aid	57
A calculator for activities not allowed other students	28
Computer software designed for students with disabilities	23
A computer for activities not allowed other students	16
Communication aids	16
Computer hardware adapted for special needs	8
Books on tape	8

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Special Education Research, National Longitudinal Transition Study-2 (NLTS2), Wave 1 student's school program survey, 2002.

In addition to the accommodations and supports they receive in their classes, more than 70 percent of secondary students with autism receive a variety of related services deemed necessary for the students to benefit from their special education programs (table 4). The types of services youth with autism receive address a wide range of needs and functional issues. Speech-language pathology services is the most frequently received type of service,<sup>14</sup> with two-thirds receiving this assistance. More than half receive special transportation because of their disability or participate in adaptive physical education (54 percent and 51 percent, respectively). The services of a behavior interventionist are provided to 35 percent of students with autism. Communication services, psychological or mental health counseling or services, and social work services each are provided to 22 percent of secondary students with autism. Assistive technology services or devices are used by 30 percent of students with autism. In addition, 24 percent receive occupational therapy, 14 percent receive health services, and 6 percent receive physical therapy.

The related services and supports provided to students with autism are meant to be coordinated and integrated into a student's overall educational program. To facilitate this coordination and integration of services, a case manager is assigned to some students by their schools. A case manager "...coordinates and oversees services on behalf of the student. In some schools, this person might be the child's special education teacher. In other schools, supervisory school district personnel may

<sup>14</sup> The following significance levels are listed for comparisons of speech-language pathology services, with the next four most frequently received types of services:  $p < .05$ ,  $p < .001$ ,  $p < .001$ ,  $p < .001$ , although all comparisons are significant.

Table 4. Related services provided to students with autism from or through their school

Related service	Percent
Some type of related service	70
Speech/communication services	
Speech-language pathology services	67
Communication services	22
Transportation	54
Adaptive physical education	51
Behavior/personal counseling	
Behavioral intervention services	35
Psychological/mental health services	22
Social work services	22
Assistive technology services/devices	30
Therapeutic services	
Occupational therapy	24
Physical therapy	6
Health services	14

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Special Education Research, National Longitudinal Transition Study-2 (NLTS2), Wave 1 student's school program survey, 2002.

assume this responsibility" (Mattson 2001, p. 14). Almost half (45 percent) of secondary students with autism have a case manager provided from or through their school.

## Summing Up

This fact sheet provides a national picture of the secondary school experiences of students with autism who received special education services under the auspices of school districts at the time they were initially sampled for the study. Students were identified by their school districts as having autism as a primary disability.



Criteria for identification as a student with autism differ from state to state, resulting in wide variation among students in the autism disability category. The variation in criteria used and the resulting variation in the ability of students included in the autism category suggest that this category includes those identified with autism spectrum disorder (ASD) and conditions such as Asperger's Syndrome and pervasive developmental disorder

This fact sheet provides a description of students' secondary school experiences and does not address questions regarding the appropriateness of particular experiences or school practices for students with autism nor is there an intention to imply causality from the data presented in this fact sheet.

Secondary school students with autism take a range of courses in a given semester, with many taking academic, vocational, and other types of courses, such as life skills. Most take classes in both general and special education settings, although they are more likely to take courses in a special than a general education setting.

The curriculum used to instruct the majority of students with autism who are in general education academic classes often is modified to some degree. Reports of most other teacher-directed aspects of the class, such as instructional groupings,<sup>15</sup> materials used, and instructional experiences outside the classroom, are largely the same for students with autism as for their classmates.

This similarity of teacher-directed experiences of students with autism and their peers in general education academic classes contrasts sharply with the differences between the groups in their participation in those classes. Students with autism

are consistently reported to be less likely to participate in their general education academic classes than are their classmates.

In addition to academic subjects in general education settings, students with autism take general education vocational classes. Similar to experiences in general education academic courses, many students with autism in general education vocational classes experience the same instructional practices as the class as a whole.

Almost 9 in 10 secondary students with autism take at least one nonvocational special education course in a semester. The use of a general education curriculum without modification is rare in such classes; the large majority of students with autism receive a curriculum with some degree of modification or specialization, or they have no curriculum at all. Students are more likely to receive individual or small-group instruction in special education than in general education classes. A variety of instructional materials and equipment are used in nonvocational special education classes, augmented by instructional activities that occur outside the classroom. More than half of those with autism participate in class discussions, respond orally to questions, and work with a peer or group at least sometimes in their nonvocational special education courses.

Almost all secondary students with autism are reported to receive some type of accommodation, modification, support, technology aid, or related service. Additional time to complete assignments and tests and modified tests and assignments are among the more frequent types of accommodations. Instructional support often is provided through monitoring of students' progress by special education teachers and individual help from teacher aides, instructional assistants, or personal

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<sup>15</sup> An exception is the amount of individual instruction received from an adult other than the teacher.

aides. Technology aids are less frequently provided than other types of supports and services. In addition to the accommodations and supports they receive in their classes, students with autism receive a variety of related services, addressing a wide range of needs and functional issues. Speech-language pathology services are the most frequently received type of service. Almost half of secondary students with autism have a case manager provided from or through their school to help coordinate and oversee services.

This is the third in a series of NLTS2 fact sheets that focus on the experiences and outcomes of youth in a specific disability category. Previous briefs focused on students with ADHD and students with learning disabilities. These and other products from NLTS2 are available at [www.nlts2.org](http://www.nlts2.org).

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