

The Status of Service and Support Provision for Diploma-Track High School Students on the Autism Spectrum

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- **Students on the autism spectrum who complete a regular high school diploma are a growing population; little is known about how these students are currently supported.**
- **A large sample of special education administrators, special education and general education teachers, and related school personnel completed an online survey that documented levels and types of educational support provided to these students in one Northeast state.**
- **School personnel reported that they regularly provided services and supports to address these students' academic (organizational and study skills) and social skills.**
- **Few participants reported providing supports or services to address disability disclosure or advocacy, self-care, and mental health symptom management for this population.**
- **Special education teachers, general education teachers, and school counselors provided most supports and services.**
- **There is a need to evaluate and determine which services provide optimal preparation for academically capable students on the autism spectrum.**

Key words: Autism, High School, Survey Research, School Personnel.

Academically Capable Students on the Autism Spectrum

The number of youths who receive special education services under the autism disability category has risen steadily over the past decade; currently over 575,000 students are in this category (Snyder, de Brey, & Dillow, 2018). Moreover, the proportion of students on the autism spectrum who have average or higher intellectual ability has also increased (Baio et al., 2018). Despite their intellectual abilities, these students often qualify for special education services based on their need for social-communication, executive functioning, behavioral, or other academic supports (Laxman, Taylor, DaWalt, Greenberg, & Mailick, 2019). Providing special education services and supports to students on the autism spectrum who are academically capable poses challenges,

especially in high school, as inclusion in general education classes and academic demands may leave little time for additional supports and services to prepare this population for life after school.

Transition Preparation for Diploma-Track High School Students on the Autism Spectrum

Research documents that individuals on the autism spectrum who have average or above intellectual ability do not achieve adult outcomes commensurate with their potential. Many struggle to complete postsecondary education or secure employment that is aligned with their capabilities (Roux, Shattuck, Rast, Rava, & Anderson, 2015). Data from the National Longitudinal Transition Study–2 indicate

that one-third of young adults on the autism spectrum have not attended postsecondary education nor obtained employment (Roux et al., 2015). Using recent national data on recipients of state services for individuals with developmental disabilities, Roux, Rast, Anderson, and Shattuck (2017) reported that only 14% of adults on the autism spectrum held a job for pay in the community. Only half of adults on the autism spectrum who did not have intellectual disability and who desired a competitive job in the community had one. Another recent study provided detailed information about the post-school outcomes of 36 youth on the autism spectrum (Taylor & DaWalt, 2017). Half of the study participants either experienced a disruption in postsecondary education or employment or did not participate in any employment or further education. Of note, family factors (e.g., parental depression or anxiety), rather than characteristics of the youth (e.g., intellectual ability), were predictive of youth postschool disruptions.

Inadequate preparation during high school may be one factor contributing to poor adult outcomes for individuals on the autism spectrum (Anderson & Butt, 2018; Laxman et al., 2019; Roux et al., 2015). The Individuals with Disabilities Education Act (IDEA, 2004) mandates that special education services and supports are individualized; consider the student's strengths, preferences, and interests; and that transition planning for life after school begins by age 16. According to IDEA (2004), transition planning must also include opportunities to develop functional skills for work and community life. Several authors have outlined recommended best practices or suggestions on transition preparation for students across the full autism spectrum (Carter, Taylor, Harvey, & Gotham, 2013; Roberts, 2010; Test, Smith, & Carter, 2014; Wehman et al., 2014) or evidence-based transition practices for students with disabilities in general (Mazzotti, Test, & Mustian, 2014). However, qualitative accounts from parents of young people on the autism spectrum who plan to graduate with a regular diploma suggest that an overemphasis on academic performance in high school may leave little time or resources to address the students' social-communication, executive functioning, mental health concerns despite the impact that limitations in these areas may have on their adult outcomes (Anderson & Butt, 2018). They also identify a need for further development of daily life skills (Anderson & Butt, 2018). A recent report from the U.S. Department

of Health and Human Services (2017) summarized the challenges that youth on the autism spectrum face when transitioning into adulthood. The report called for further research to establish a base of evidence regarding the program components being provided to students during their transition preparation and which services are effective in meeting the needs of students entering adulthood. However, there is currently no specific descriptive information, guidelines, or evidence-based practices for addressing the needs of the specific subpopulation of students on the autism spectrum who plan to graduate with a regular high school diploma.

The Need to Develop Best Practices

It may be difficult for schools to determine how best to support diploma-track students with autism as they transition to adulthood.

These students take and pass the prerequisite general education courses and, in states that require it, also pass the state's standardized assessment to graduate with a regular high school diploma. Graduating with a diploma is an attractive option to students, as it affords choices and opportunities for postsecondary education and competitive employment. However, the time spent in general education classes may preclude the provision of services to prepare these students more fully for adult roles. These students have less available time during the school day, and existing services and supports may not be appropriate for these students' needs. Special education administrators have a key role in determining how best to support these students for success while maintaining their ability to academically engage.

In years past, these students often graduated with their same-aged peers and exited the school system. However, according to federal IDEA guidelines, students who receive special education services are entitled to services through age 21 (IDEA, 2004), so it is possible that students who have completed graduation requirements could delay acceptance of their diploma in order to remain eligible for services

to address special education goals that are not yet achieved. This situation could create further challenges to schools because they do not necessarily have appropriate transition programming for this population. Currently, there is no research literature that documents these challenges to schools and the frequency with which these students are delaying acceptance of their diploma so that they can continue to receive services.

Research on High School Students on the Autism Spectrum

Some information about special education service provision to high school students across the autism spectrum is available. Findings from research by the Center on Secondary Education for Students with Autism Spectrum Disorder described the educational and support needs of these students and how some of these needs were currently being met (Kucharczyk et al., 2015). The researchers conducted 28 focus groups with 152 participants, including parents, individuals on the autism spectrum, special education teachers and administrators, and other service providers and community members. Participants overwhelmingly expressed that students' educational needs were not being met. They attributed some of the unmet needs to limited school resources and inconsistent service and intervention delivery within a school setting. Some educational needs were viewed as currently being met through peer-mediated programs (peer supports), formal seminars, and orientation events (such as teaching life skills in a freshman seminar). Other needs were met through accommodations and specialist services outlined in the student's individualized education program (IEP). The findings from these focus groups provide a general description of the range of the needs and how these needs are being met and highlight variability across schools. However, they focus on students across the full spectrum and do not provide information on the frequency or prevalence of specific approaches to providing services and supports for the students expected to graduate with a regular high school diploma.

Other researchers have examined the frequency with which students across the autism spectrum in high school receive special education services and supports (Shattuck, Lau, Anderson, & Kuo, 2018) and instructional practices for students on the autism

spectrum who also have intellectual disability (Knight, Huber, Kuntz, Carter, & Juarez, 2019). This information, however, may not be applicable to diploma-track high school students on the autism spectrum who may have unique experiences or educational and support needs. According to data from the National Survey of Children's Health 2016, 70% of students on the autism spectrum were enrolled in special education at some point during their schooling, with the most common services or accommodations being the presence of a teacher's aide or personal assistant, speech-language therapy, and psychological or mental health services or counseling (Shattuck et al., 2018). Similarly, Knight et al. (2019) surveyed special educators to identify the most common instructional approaches used with students on the autism spectrum who also had intellectual disability. These special educators, 21% of whom worked in high schools, most frequently used direct instruction, modeling, environmental modifications, behavioral approaches (applied behavioral analysis), visual supports, and self-management interventions. The extent to which these services, accommodations, and approaches are used with diploma-track students on the autism spectrum is not known.

Study Goals

None of this research has focused specifically on high school students on the autism spectrum who plan to graduate with a regular high school diploma.

As the number of students on the autism spectrum who do not have intellectual disability continues to increase, schools will need to develop and assess the effectiveness of their current practices and approaches.

Thus, this study aimed to describe the current status of service provision through a statewide online survey conducted with school personnel who provide services to this population. Our goal was to identify the types of services and supports that schools provide for diploma-track high school students who are on the autism spectrum.

Survey Participants

Complete data were available from 107 participants from one state in the Northeast United States. Most of the participants were special education teachers, administrators, or transition coordinators (see Table 1). Over 95% of the participants reported on a single high school in their school district, while 11 participants (10.3%) reported based on multiple high schools in their school district. Accordingly, 63% of respondents reported that there was only one high school in their district, 11 participants (10.3%) reported two high schools in their district, and the remaining participants reported between three and nine high schools in their districts. Only six of the participants (5.6%) held a specialist endorsement or certificate for transition services. General information about the schools, districts, and communities is provided in Table 2. Many of the participants reported on medium-sized suburban public schools, although there was also considerable diversity of school types and communities. Only half of the respondents reported that their school or district had a designated special education transition coordinator. Table 3 provides information about the student population in each school or school district, as well as specific information about diploma-track students on the autism spectrum.

Developing the Survey

The survey items were developed using two methods to ensure the content and social validity of the survey. First, focus groups of school personnel who reported working directly with diploma-track high school students on the autism spectrum ($N = 23$) were conducted between March and April 2017 (Cohn, Orsmond, Coster, & Chen, 2018). Participants in the focus groups included transition coordinators, special education teachers, special education supervisors/administrators/directors/coordinators, autism inclusion teachers, vocational counselors, speech-language pathologists, and assistive technology specialists. Focus groups were led using a flexible interview guide to elicit school personnel's perspectives on their experiences providing services and supports to prepare diploma-track high school students on the autism spectrum for life after graduation. Focus group transcripts were analyzed for content and topics that were relevant to include in the survey. For example, content such as lists of

Table 1: Participant characteristics ($N = 107$)

Characteristics	Mean or % (n)	SD	Range
Age (years)	45.1	11.5	25–66
Gender			
Female	82.2% (88)		
Male	16.8% (18)		
Non-binary	0.9% (1)		
Position			
Special education teacher	23.4% (25)		
Special education coordinator	23.4% (25)		
Special education administrator	14.0% (15)		
Special education liaison	6.5% (7)		
Transition coordinator	5.6% (6)		
Speech language therapist	5.6% (6)		
School psychologist	3.7% (4)		
School adjustment counselor	3.7% (4)		
Vocational specialist/coordinator	0.9% (1)		
Inclusion specialist/coordinator	0.9% (1)		
General education teacher	0.9% (1)		
School social worker	0.9% (1)		
Occupational therapist	0.9% (1)		
Other	9.3% (10)		
Years in position	7.44	6.31	1–36
Years worked with diploma-track youth on autism spectrum	11.73	8.08	1–34
Number of diploma-track youth on autism spectrum responsible for overseeing			
2 or fewer	22.4% (24)		
3–10	45.8% (49)		
11–30	21.5% (23)		
31–50	5.6% (6)		
More than 50	4.7% (5)		

common supports and services, as well as topics such as relevance of the transition-planning document were extracted from the transcripts and used to develop survey items.

After a thorough analysis of the focus group transcripts, a literature review was undertaken to

Table 2: School or district characteristics

Characteristics	% (n)
Type of school or school district	
Public school or school district	76.6 (82)
Charter public school	5.6 (6)
Public school collaborative	4.7 (5)
Alternate education program	2.8 (3)
Approved special education school	5.6 (6)
Private school	1.9 (2)
Other	2.8 (3)
Community type	
Urban	27.1 (29)
Suburban	63.6 (68)
Rural	20.6 (22)
Number of high school students in district	
Fewer than 300 students	19.6 (21)
300–999 students	28.0 (31)
1,000–1,999 students	29.0 (31)
2,000–3,999 students	21.1 (13)
4,000–6,999 students	3.7 (4)
7,000–10,000 students	1.9 (2)
More than 10,000 students	5.6 (6)
School or district has special education transition coordinator	49.5 (53)

ensure that all relevant content areas were included in the survey and to inform the survey item response structure. The authors reviewed research articles addressing current best practices in transition planning, common high school supports, and the experiences of youth on the autism spectrum, their parents, and school personnel during the transition period (Carter et al., 2013; Hedges et al., 2014; Roberts, 2010; U.S. Government Accountability Office, 2017; Wehman et al., 2014).

The final version of the survey was developed through multiple cycles of item and response option development and review by the authors. Members of the research team provided feedback on wording, item content, response structure, and item organization. Additional drafts were reviewed until

all authors reached consensus on a final draft for advisory board members to review.

A draft survey with 61 items was sent to members of the advisory board, which included a high school transition coordinator, an administrator at a collaborative high school, a leader of a community agency for families of children on the autism spectrum, and a young adult on the autism spectrum. The advisory board members provided feedback regarding clarity of questions and terminology, whether any questions were difficult to answer or irrelevant, and whether any important topic areas had been neglected. Feedback from the advisory board members generally focused on clarifying item wording or adjusting response options. The feedback was incorporated into the final, 64-item survey. The items relevant to the research question and focus of this manuscript are presented in Table 4.

The finalized survey was programmed into Qualtrics software for online distribution. Qualtrics software offers participants the option of taking the survey using a computer or a cellular phone. Both versions of the formatted survey were piloted by members of the research team multiple times to ensure errorless, user-friendly formatting and to determine the amount of time the survey would take to complete.

The Survey Content

The final survey contained 64 items (four short answer items and 60 multiple choice items), taking approximately 30–45 minutes to complete. The survey questions were divided into six parts grouped by the theme of the question:

1. Questions confirming eligibility criteria and consent
2. Questions about the participant and their role in the school district (e.g., job title and description, years in current position)
3. Questions describing the participant's school district (e.g., size of school and type of community, percentage of students that qualify for the National School Lunch Program)
4. General questions about diploma-track students on the autism spectrum (e.g., percent of time spent in general education classes, youth and family participation in IEP meetings)
5. Specific questions about the supports and services provided to diploma-track students on the autism

Table 3: Student population characteristics

Characteristics	% (n) or Mean	Median	Range
Student Race and/or Ethnicity			
White	65.2%	77.4%	0–100%
Hispanic or Latino	13.1%	5.0%	0–95%
Black or African American	7.3%	3.2%	0–60%
Asian	4.8%	2.0%	0–52%
American Indian or Alaskan Native	0.6%	0%	0–20%
Native Hawaiian or Pacific Islander	0.5%	0%	0–15%
More than one race or ethnicity	6.5%	2.0%	0–68%
Percent who qualify for national school lunch program			
0–20%	38.3% (41)		
21–40%	19.6% (21)		
41–60%	9.3% (10)		
61–80%	14.0% (15)		
81–100%	12.1% (13)		
Number of students on autism spectrum who graduated with regular diploma in past year			
0–5	61.7% (66)		
6–10	21.5% (23)		
11–15	10.3% (11)		
16–20	1.9% (2)		
More than 20	2.8% (3)		

spectrum (e.g., assessment methods used, how often various supports are provided and by whom, referrals to outside agencies)

- Questions about transition planning for diploma-track students on the autism spectrum (e.g., how and when the transition planning document is completed, barriers and supports to transition success).

Survey Administration

Participants were high school personnel from public and private schools across Massachusetts. High school personnel qualified for the survey if they endorsed the following question: “Are you knowledgeable about the supports and services that are provided for students in your high school or school district who have autism and plan to graduate with a regular high school diploma (i.e., not a certificate of completion, modified diploma, or

similar document)?” Potential school personnel participants were identified through multiple methods, including online searches of district and high school websites to identify special education staff and via personal contacts. Directors of special education, special education team chairs and administrators, transition coordinators, and high school autism specialists were contacted first. Next, high school or district level school psychologists, special education teachers, occupational therapists, physical therapists, guidance counselors, and general special education staff were contacted. Potential participants were sent a recruitment email describing the project and survey. If the potential participant contacted did not qualify for the survey, they were asked to forward the recruitment email to a colleague that did qualify.

Participants accessed the survey through a generic link provided in the recruitment email. Captcha Verification was used to verify that the

Table 4: High school personnel survey items**Eligibility criteria**

1. Are you 18 years of age or older? (Yes, No)
2. Do you work in a school or school district in Massachusetts? (Yes, No)
3. Are you knowledgeable about the supports and services that are provided for students in your high school or school district who have autism and plan to graduate with a regular high school diploma (i.e., not a certificate of completion, modified diploma, or similar document)? (Yes, No)

Participant and their role in school district

4. What is your gender? (Male; Female; Non-binary/Third gender; Prefer to self-describe; Prefer not to say)
5. What is your age?
6. Which title most closely matches your primary job title? (Options listed in Table 1)
7. How many years have you worked in your current position in this school district?
8. How many years of experience do you have working with high school students with autism who are on track to graduate with a regular diploma (i.e., not a certificate of completion, modified diploma, or similar document)?
9. How many diploma-track students with autism do you have responsibility for? (0–2, 3–20, 11–30, 31–50, 51+)
10. Does your school or school district have a transition coordinator? (Yes, at the district level; Yes, at the school level; No)
11. Do you hold a transition specialist endorsement or certificate? (Yes, No)
12. Does anyone else in your school or school district hold a transition specialist endorsement or certificate? (Yes, No, I don't know)

Questions about the participant's school district

13. Which of the following best describes your school or school district? (Type options listed in Table 2)
14. Select the responses that best describe the community in which your school or school district is located. (Check all that apply: Urban community, Suburban community, Rural community)
15. Approximately what percentage of the student body fall into the following racial categories? (Response options listed in Table 3)
16. What percentage of students in your school or school district qualify for the National School Lunch Program (receive free or reduced-price meals at school)? (Response options listed in Table 3)
17. What is the total number of high school students in your school district? (Response options listed in Table 2)
18. In the past year, what percentage of students with autism in your school or school district graduated with a regular high school diploma (i.e., not a certificate of completion, modified diploma, or similar document)? (Response options listed in Table 3)
19. What percentage of diploma-track students with autism have (An IEP, A 504 Plan, Neither, Unsure)

General questions about diploma-track students on the autism spectrum

20. Has your school or school district articulated an approach to providing services for the group of diploma-track students with autism? (Yes, No, I don't know)
21. On average, approximately how much time do diploma-track students with autism spend in a general education setting? (Response options listed in Table 5)

Specific questions about the supports and services provided to diploma-track students on the autism spectrum

22. Does your school or school district provide instruction, supports or opportunities for diploma-track students with autism in the following areas? (Never provided, Referred to outside agency, Provided regularly in school, Provided occasionally in school, I don't know; items reported in Table 6)
23. Which of the following school personnel provide the instruction, supports, or opportunities? (personnel listed in Table 7)

Questions about transition planning for diploma-track students on the autism spectrum

24. In the past three years what is the frequency in which diploma-track students with autism who have completed the graduation requirements delayed receiving their diploma to enable them to continue to receive school services? (Very frequently, Frequently, Occasionally, Never, I do not know)
25. What percentage of students who delay receiving their diploma are enrolled in a specialized transition program? (75–100%, 50–74%, 25–49%, 1–24%, None)

anonymous survey responses were from human participants, not computers. Once participants began the survey, they could stop and return to the survey for up to 72 hours. After this point, Qualtrics saved the responses and deactivated the survey. Upon

completing the survey, participants' responses were anonymously recorded, and participants were automatically sent to a second Qualtrics web page to provide their contact information to be included in a drawing for an iPad.

The survey was active for 10 months, beginning on September 18, 2017. During this time, one or more school personnel from approximately 480 schools were contacted via email. Total number of responses as well as participant zip code and participant demographics were monitored to track that a representative sample was being obtained. Up to three reminder emails were sent to school personnel from districts that had not yet had a representative from their district complete the survey. The survey was opened a total of 231 times, with a total of 107 completed surveys.

Informed consent was obtained from all individual participants included in the study. All procedures performed involving human participants were in accordance with the ethical standards of the Boston University Charles River Campus Internal Review Board (Protocol #4137E) and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Data Analysis

We conducted quantitative data analysis on data from Parts 1–5 of the online survey. The data were downloaded from Qualtrics and analyzed using SPSS, version 24.0. Descriptive analyses of mean, median, range, or frequencies were calculated to describe participant, school or district, and student characteristics. Frequencies were calculated for instruction or support items the respondent rated as “regularly provided” to diploma-track students on the autism spectrum.

Survey Findings

Special Education Characteristics of Diploma Track Students on the Autism Spectrum. School personnel reported that most diploma-track students on the autism spectrum in their school or district had an individualized education program (IEP; see Table 5). One-third of the sample (35.5%) reported that all diploma-track students on the autism spectrum in their school or district had an IEP. About 10% of participants reported that these students had neither an IEP nor a 504 plan.

Most diploma-track students on the autism spectrum spent most of their time in general

education settings, while one-quarter spent less than 50% of their time in general education settings.

About half of school personnel (51.4%) reported that their school or school district had an articulated approach to providing services for diploma-track students on the autism spectrum. Twenty percent of school personnel reported that diploma track students on the autism spectrum frequently or very frequently delayed receiving their diploma. About half of the school personnel reported that most of the students who delayed receiving their diploma (75 to 100%) were enrolled in a specialized transition program.

Most Frequent Types of Instruction or Supports Provided to Diploma-Track Students on the Autism Spectrum. Schools were most likely to regularly provide services to address organizational skills, study skills, and social skills interventions or supports to diploma-track students on the autism spectrum (see Table 6). Over half of the schools regularly provided these supports, as well as behavioral interventions, self-determination or problem-solving instruction (including goal setting), career exploration, resume writing, assistive technology instruction or support, and interview skills instruction. Between 40% and 46% of schools reported regularly providing education on disability disclosure and advocacy, sexual health, self-care instruction, mental health symptom management, and financial literacy or money management instruction. A few school personnel (12.1%) reported referring the student to an outside agency for mental health symptom management. Less than one-third of schools reported regularly providing instruction or supports to address independent living skills, travel in the community, safety in the community, leisure exploration or skill development, job shadowing, or job coaching for this population. The frequency with which community experiences were provided for this population varied from only one to two times per year (24.3%) to seven or more times per year (25%). Participants reported that the primary barriers to providing community experiences for this population included lack of time in the school day and year (37%), lack of transportation (13%), and personnel costs (10%).

Table 5: Special education characteristics of diploma track students on the autism spectrum ($N = 107$)

Characteristics	% (n) or Mean	Median	Range
Percentage of diploma-track students on autism spectrum who have IEP	65.4%	90.0%	0–100%
Percentage of diploma-track students on autism spectrum who have 504 plan	3.7%	0.0%	0–30%
Percentage of diploma-track students on autism spectrum who neither IEP or 504	1.8%	0.0%	0–85%
Average percent of time spent in general education setting			
0–30%	16.8% (18)		
31–60%	10.3% (11)		
61–90%	44.9% (48)		
91–100%	20.6% (22)		
Percentage of respondents reporting school had an articulated approach to service provision			
Yes	51.4% (55)		
No	31.8% (34)		
Do not know	11.2% (12)		
Frequency with which diploma-track students on the autism spectrum delayed receiving their diploma			
Very frequently	9.3% (10)		
Frequently	10.3% (11)		
Occasionally	33.6% (36)		
Never	16.8% (18)		
Do not know	15.0% (16)		
Percentage of students who delayed receiving their diploma and who are enrolled in a specialized transition program ($n = 56$)			
None	12.5% (7)		
1–24%	21.4% (12)		
25–49%	1.8% (1)		
50–74%	12.5% (7)		
75–100%	51.8% (29)		

School Personnel Reported to Regularly Provide Instruction or Supports to Diploma-Track Students on the Autism Spectrum. For each respondent who indicated that their school regularly provided a specific type of instruction or support, we identified which school personnel assumed responsibility for providing that type of instruction or support. As seen in Table 7, a variety of school personnel shared responsibility for providing instruction and supports to diploma-track students on the autism spectrum. Special education teachers, general education teachers, and school adjustment counselors were reported to assume

primary roles in providing instruction and supports to these students. Out of all categories of school personnel, survey respondents reported that special education teachers most frequently provided each type of instruction or support, except for mental health symptom management. The percentage of respondents who reported that special education teachers regularly provided the given support or instruction in their school varied from 39% to 94%. General education teachers were the second most frequently reported school personnel to be involved in regularly providing organizational skills (32%), study skills (32%), resumé writing instruction (29%),

Table 6: Most frequent types of instruction or supports provided to diploma-track students on the autism spectrum

Type of instruction or support ^a	% of schools that regularly provide	% of schools that occasionally provide	% of schools that never provide	% of schools that refer to outside agency
Organizational skills	73.8	12.1	0.0	0.9
Study skills	72.9	12.1	0.0	0.9
Social skills	68.2	17.8	0.0	0.0
Behavioral interventions	59.8	24.3	0.9	2.8
Self-determination/problem-solving/goal setting	58.9	22.4	1.9	0.9
Career exploration	57.0	26.2	0.0	2.8
Resume writing	54.2	24.3	0.9	4.7
Assistive technology	53.3	29.9	0.9	1.9
Interview skills	50.5	27.1	1.9	4.7
Disability disclosure/advocacy	45.8	29.0	4.7	3.7
Self-care	44.9	26.2	6.5	4.7
Mental health symptom management	43.0	25.2	4.7	12.1
Financial literacy/money management	42.1	37.4	1.9	3.7

^a Percent may not add up to 100% as some school personnel did not know if instruction or support was provided.

and financial literacy/money management instruction (36%). Of all the school personnel, school adjustment counselors were most likely to provide mental health symptom management (65%) and played a large role in regularly providing social skill supports (46%), behavioral interventions (38%), and self-determination supports (41%).

Regarding the other school personnel categories, guidance counselors were most widely reported to support career exploration (48%), as well as self-determination (38%), and mental health symptom management (33%). Transition coordinators were most commonly reported to provide employment related supports: career exploration (30%), resume writing support (28%), and interview skills instruction (30%). School psychologists and social workers had a similar pattern of involvement in service provision, with both categories of personnel most likely to provide mental health symptom management (61% and 50% respectively). Behavioral specialists were most likely to provide behavioral interventions (64%) with relatively low frequency of reported involvement in other types of interventions and supports. Occupational therapists and physical therapists had low levels of involvement in providing interventions and supports to diploma-track students on the

autism spectrum, except for survey respondents reporting that occupational therapists were regularly involved in providing assistive technology supports (32%) and self-care interventions (27%).

Summary and Future Directions

The purpose of this study was to identify the types of services and supports that schools provide for diploma-track high school students who are on the autism spectrum. The findings from this study highlight the considerable variability of special education service provision to this population. This subgroup of students on the autism spectrum likely has different learning needs than students working towards a modified diploma or certificate of completion. Their relative or exceptional intellectual strengths pose a challenge to schools in terms of what services or supports are appropriate to provide and how to provide them. There are currently no guidelines or best practices for this population. Furthermore, this challenge will increase over the next decade. An estimated 500,000 students with autism will graduate or age out of school-based services over the next decade (Roux et al., 2013). Approximately 44% of these students with autism have average to above average intelligence (Wodka,

Table 7: School personnel reported to regularly provide instruction or supports to diploma-track students on the autism spectrum^a

Type of instruction or support ^b	Special education teacher, %	General education teacher, %	SLP, %	Adjustment counselor, %	Guidance counselor, %	Transition coordinator, %	School psychologist, %	Social worker, %	Behavioral specialist, %	PT, %	OT, %
Organizational skills	92.4	31.6	20.3	15.2	12.7	12.7	7.6	7.6	6.3	0	8.9
Study skills	93.6	32.1	11.5	11.5	9.0	7.7	3.8	7.7	3.8	0	3.8
Social skills	67.6	6.8	59.5	45.9	23.0	14.9	36.5	31.1	24.3	1.4	12.2
Behavioral interventions	75.0	10.9	14.1	37.5	18.8	6.3	32.8	25.0	64.1	1.6	5.7
Self-determination/problem-solving/goal setting	84.1	9.5	31.7	41.3	38.1	25.4	36.5	27.0	17.5	1.6	11.1
Career exploration	67.2	19.7	13.1	16.4	47.5	29.5	1.6	4.9	4.9	0	1.6
Resume writing	75.9	29.3	10.3	12.1	12.1	27.6	0	3.4	6.9	0	1.7
Assistive technology	73.7	10.5	38.6	8.8	3.5	12.3	0	1.8	5.3	1.8	31.6
Interview skills	72.2	20.4	33.3	16.7	13.0	29.6	1.9	7.4	7.4	0	1.9
Disability disclosure/advocacy	53.7	1.9	9.3	16.7	16.7	16.7	18.5	13.0	5.6	0	1.9
Self-care	81.3	2.1	18.8	31.3	18.8	20.8	16.7	14.6	20.8	0	27.1
Mental health symptom management	39.1	2.2	6.5	65.2	32.6	4.3	60.9	50.0	23.9	0	4.3
Financial literacy/money management	84.4	35.6	0.0	6.7	0.0	26.7	2.2	2.2	6.7	0	2.2

^a Percent represents the percent of respondents who report that the given school personnel regularly provides the support in their school or school district.

^b Participants selected all school personnel who regularly provided each type of instruction or support so percent will not add up to 100%.

Mathy, & Kalb, 2013) and will likely graduate with regular high school diplomas. As illustrated by our data, over 40% of participants reported that six or more students on the autism spectrum had graduated with a regular diploma from their school or school district in the past year.

Special education administrators will need to develop best practices and a systematic approach to balancing the academic and support needs of this population.

Discussion of Special Education Characteristics of Diploma Track Students on the Autism Spectrum. Participants reported variability in terms of whether diploma-track students on the autism spectrum were currently receiving special education supports and services. A large majority of these students received special education supports or learning accommodations through an IEP or 504 plan; however, not all students did. Approximately 10% of school personnel reported that diploma-track students on the autism spectrum in their school had neither an IEP nor a 504 plan. Similarly, most diploma-track students on the autism spectrum spent most of their time in general education settings. Those who spent less time in general education settings attended approved special education schools, or alternative education programs or special education collaborative programs within public school settings. This variability also likely reflects the varied behavioral and learning characteristics of this population, as well as school or district practices and resources.

Discussion of the Most Frequent Types of Instruction or Supports Provided to Diploma-Track Students on the Autism Spectrum. We focused this report on the types of instruction or supports that school personnel described as being “regularly provided” for this population. We interpreted these findings as suggestive of a programmatic approach to providing certain types of instruction or supports within a school or district. These data indicate that schools routinely focus on academic preparation for diploma-track students on the autism spectrum. The two types of instruction or support that were regularly provided most often were for

organizational and study skills, for which special education teachers were the primary providers, followed by general education teachers.

Academic support for students on the diploma-track is appropriate and important, but a focus on academics may overshadow other types of instruction or support that may be important post-graduation for students on the autism spectrum. Fewer than half of the schools or districts were reported to regularly provide instruction or supports on disability disclosure or advocacy, self-care, and mental health symptom management. These areas of development will become increasingly important as these students continue to postsecondary education or employment. College students on the autism spectrum may be reluctant to disclose their diagnosis and seek accommodations, even when supports may be beneficial (Nuske, Rillotta, Bellon, & Richdale, 2019). Similarly, disclosing a diagnosis to a potential employer can have both benefits and limitations for adults on the autism spectrum (Nicholas, Mitchell, Dudley, Clarke, & Zulla, 2018). Thus, students on the autism spectrum would benefit from education and discussion about when and how to disclose a disability, or how to advocate for accommodations or supports.

Moreover, the ability to care for oneself and manage mental health challenges is important for independent living in adulthood. A student’s transition plan is required to include the development of skills needed for further education, employment, and community life (IDEA, 2004). Considerable prior research documents that individuals on the autism spectrum who do not have intellectual disability have persistent challenges with adaptive behavior throughout adolescence and adulthood (Kraepel, Kenworthy, Popal, Martin, & Wallace, 2017; Pugliese et al., 2016). Moreover, school age children and adolescents on the autism spectrum, particularly those with higher verbal abilities, are at increased risk for developing affect- and anxiety-specific mental health challenges that persist into young adulthood (Gotham, Brunwasser, & Lord, 2015).

Greater attention paid to developing the skills necessary to self-manage daily life and mental health challenges would better prepare these students for life after graduation.

Discussion of School Personnel Reported to Regularly Provide Instruction or Supports to Diploma-Track Students on the Autism Spectrum.

In terms of the personnel within schools who provide instruction and supports to these students, special education teachers clearly play an important role. Except for disability disclosure/advocacy and mental health symptom management, in over 70% of schools a special education teacher regularly provided each specific type of instruction or support to these students. Moreover, the types of instruction and support provided by special education teachers addressed many different areas of student development. For example, when self-care instruction or support was regularly provided in a school or district, it was mostly likely to be provided by a special education teacher. For some of the types of instruction or support, such as daily task management or disability disclosure and advocacy, there may be a missed opportunity to utilize the expertise of other school personnel or related service providers such as occupational therapists and speech-language pathologists. The continued growth of this population in the coming years may require schools to more equitably distribute instruction and supports to other school personnel who have relevant expertise.

General education teachers and school counselors (adjustment and guidance) were also reported to have a relatively large role in providing instruction and supports to this population. Prior research indicates that general education teachers often feel unprepared to educate students on the autism spectrum (Brock, Huber, Carter, Juarez, & Warren, 2014). Similarly, it is not clear what types of instruction or training school adjustment and guidance counselors receive that is specifically focused on supporting students on the autism spectrum. None of the counselors reported holding a transition specialist certificate or endorsement. As others have noted, there is a great need to systematically evaluate current teacher education practices and to create evidence-based professional development materials for general education teachers and counselors that address current challenges in inclusive education and students on the autism spectrum (Brock et al., 2014). The challenges to educators may be particularly notable for students on the autism spectrum who demonstrate academic potential but have social or behavioral challenges that interfere with their performance (Hedges et al., 2014).

The findings also illustrate the need for considerable communication, teamwork, and coordination among school personnel who provide services and supports to this population. For many of the types of instruction or supports, multiple school personnel were involved. Although communication among special education teams is important across the school years, the coordination challenges for this population may be heightened in high school. Students likely have multiple general education teachers in addition to their special education supports. It may not be clear who needs to attend special education meetings and how to most effectively communicate and coordinate service provision.

Overall, the instruction and support provided to diploma-track students on the autism spectrum does appear appropriate, given that these students are primarily in general education classrooms and on the diploma track. A considerable literature base describes the challenges these youth have with executive function skills (Wallace et al., 2016; White et al., 2017). Therefore, attention to developing organizational and study skills seems warranted. However, several important areas of development needed for adult roles do not seem to be consistently addressed. Students on the autism spectrum may need explicit instruction on skills that other youth learn implicitly or in a less structured manner, such as financial management and self-care. Moreover, experiential or community-based experiences may be particularly important for this group as they prepare for adulthood. It is well known that generalization from one setting to another is challenging for youth on the autism spectrum (Brown & Bebko, 2012; Marchena, Eigsti, & Yerys, 2015; Vismara & Rogers, 2010). Few schools provided community-based learning experiences, with student schedules and lack of transportation identified as the primary barriers. One potential solution to these challenges would be to incorporate the supports and experiences needed by youth on the autism spectrum into the general education curriculum. It is likely that greater attention paid to preparing youth for daily life in adulthood would be beneficial to all students.

Limitations

One limitation of the current study is that the findings may not be generalizable to other states in

the United States. Although IDEA is a federal mandate, states can develop their own policies and procedures as interpreted to meet the law. Massachusetts also has a decentralized education system, with each town having a local education authority (LEA). Most respondents reported on one high school in the town or district, but some larger towns or small cities had several high schools. We were not able to distinguish the findings from each high school in such districts. Additionally, this state requires all students to pass a statewide exit exam, Massachusetts Comprehensive Assessment System, in order to receive a high school diploma. Therefore, the characteristics of diploma-eligible students on the autism spectrum and the services and supports provided to them may differ in states that do not have the same exit exam requirement. Moreover, the Massachusetts school system has one of the highest rates of autism identification in the United States (Dilly, Hendrix, & McCracken, 2019). Thus, if we observed these potential service gaps in this state, it is possible that other states experience similar challenges. Participant selection bias is a potential limitation to the current study. We contacted one or more school personnel at approximately 480 schools within the state, with an approximately 48% response rate. Moreover, approximately 124 potential participants started the survey but did not complete it; their data were not used in the present analysis. Future research from other states with both centralized and decentralized education systems, as well as states that do not require exit exams, will inform whether the findings from this study correspond with practices across the United States.

Where Do We Go from Here?

The present study contributes new knowledge toward understanding the needs of students on the autism spectrum who are expecting to graduate with a regular high school diploma. No prior research has documented the status of current instruction or special education service provision for this growing subpopulation of students on the autism spectrum. The findings reflect the perspectives of a relatively large sample of school personnel who educate and support high school students on the autism spectrum. Moreover, participants represented diverse communities across the state. Thus, it is believed that our findings are representative of the perspectives of

educators across the state. Overall, the findings from the study provide a description of the current status of instruction and supports provided to diploma-track students in one state.

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 This research should be replicated in other states in order to compare variations in supports and services across a larger portion of the country.

In addition, future research should assess the extent to which current instructional approaches and supports meet the needs of these students and adequately prepare them for life after school. For example, personnel from individual schools or school districts could use the results of this study to evaluate their current offerings to this population of students. Schools that add additional services or adjust existing service provision could then employ a quasiexperimental approach to assess if changes in programming relate to improved transition outcomes for diploma-track high school students on the autism spectrum. As gaps are identified, school administrators, teachers and related personnel, and researchers will need to work together to develop and evaluate effective instructional and support approaches that prepare this unique population for successful adult lives.

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