Educating Michigan's Students with Autism Spectrum Disorder:

Educating Michigan's Students with Autism Spectrum Disorder (ASD):

An Initial Exploration of Programming

"The ASD-Michigan Project"

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Final Report

Sara Bolt, Ph.D. and Summer Ferreri, Ph.D.

College of Education

Michigan State University

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Executive Summary

This report is intended to provide a snapshot of public school services provided to kindergarten through twelfth (k-12) grade students with Autism Spectrum Disorder (ASD) across the state of Michigan (MI). We used a systematic sampling process to collect information from over 200 school professionals statewide, resulting in a high degree of success in recruiting participants appropriately representing school districts from a variety of socioeconomic backgrounds and geographical regions. In order to understand parent perspectives on these services, we also collected information from 34 parents of k-12 students with ASD. Finally, supplemental information was collected through observing in several classrooms, and through a survey of a small sample of special education training program directors serving institutes of higher education across the state. Key findings are:

- Statewide datasets that are currently available on students receiving special education services are not highly conducive to university research and evaluation efforts.
- Nearly one-third (32%) of school professionals reported that they did not expect the student about whom they reported to reach grade-level achievement standards.
- Twenty-six percent (26%) of the students with ASD on whom school professionals reported were described as never or rarely having access to the general curriculum.
- Of the 65 educational interventions on which school professionals were asked to report their use, the five most commonly reported being used were: visual supports, structured teaching, direct instruction, applied behavior analysis, and social stories. Four out of these five interventions (all except direct instruction) have substantial research-based evidence supporting their use for students with ASD.
- Though many school professionals reported using the four above-mentioned interventions that are supported according to research efforts, they most commonly reported using the given interventions for only part of the day, and many did not report using them at all (i.e., 31% to 44% of school professionals reported not using them for the student on whom they reported). Follow-up observations suggest that school professionals may not incorporate core aspects of these interventions in the programming provided to students.
- The most common way in which special educators reported being trained on interventions that had substantial research support was through graduate study.
- Paraprofessionals reported having little or no formal training in the interventions with the greatest research support, even though nearly one-third of the students were reported to have a 1:1 paraprofessional/teacher assistant work with them during the school day.
- The majority of parents (62%) reported some level of satisfaction with educational services provided; however, many (76%) also reported having to request additional school services beyond what the school originally offered to provide.

Discussion and implications of key findings are provided, along with some suggested implications for future research and practice.

Introduction

Autism Spectrum Disorders: Characteristics, Diagnosis, Prevalence and Etiology

Autism spectrum disorders (ASD) are neurodevelopmental disorders manifesting in infancy or early childhood and are characterized by three main categories (a) impairments in communication, (b) impairments in social interaction, and (c) the demonstration of restricted, repetitive, and stereotyped patterns of behavior. Specifically, the spectrum includes autistic disorder, Asperger's syndrome, Rett's disorder, childhood disintegrative disorder, and pervasive developmental disorder not otherwise specified (American Psychiatric Association [APA], 2000).

Autistic disorder typically involves social, communication, leisure and play deficits in addition to idiosyncratic behavior patterns and individuals vary greatly within this disorder in terms of intellectual abilities and severity of deficits. Asperger's syndrome normally involves significant social delays and average to above average speech, language or intellectual abilities. Additionally, individuals may have an intense preoccupation with a specific topic, which interferes with functioning. Rett's disorder has been linked to a specific gene mutation; it involves a significant deterioration in global functioning following 6 to 12 months of normal development. Individuals lose purposeful use of hands, head growth decelerates, and stereotypy and mental retardation become apparent. Childhood disintegrative disorder is an abrupt or gradual developmental and behavioral deterioration after 2-4 years of normal development and the etiology remains unknown. Pervasive developmental disorder not otherwise specified (PDDNOS) is a complex category within the spectrum. Individuals diagnosed with PDDNOS typically have symptoms similar to autistic disorder, but for varying reasons, do not meet the criteria for a specific subtype (Zagar, 2005).

The term spectrum refers to the heterogeneity of individuals diagnosed with ASD (Volkmar & Lord, 2007). The severity and manner in which impairments are expressed by individuals with ASD can vary tremendously both within and across disorders. For example, individuals with autistic disorder have apparent, yet varying degrees of, impairment in communication and cognitive ability. However, to meet diagnostic criteria for Asperger's syndrome, individuals cannot display any clinically significant delay in language or cognitive development. The criteria for making a clinical diagnosis of ASD are found in the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association [DSM-IV-TR], 2000). The DSM-IV is the most frequently used system for diagnosis in the United States.

Although complexities in the diagnosis of ASD are apparent, current prevalence estimates indicate that the number of individuals with ASD continues to increase. The Autism Society of America (2003) has indicated that autism has become the fastest growing developmental disability category in the United States. Specifically, current estimates indicated that 1 out of 110 children in the United States are diagnosed with ASD (Kogan et al., 2009). This is in stark contrast to prevalence rates of approximately 4-5 per 10,000 approximately 25 years ago (Chakrabarti & Fombonne 2005; Yeargin-Allsopp et al. 2003).

The etiology of all the disorders on the spectrum is largely unknown, with the exception of Rett's disorder (a genetic mutation is found to account for the large majority of cases of Rett's disorder). The

most current evidence suggests that the remaining four disorders are brain-based disorders with a strong genetic component, however the exact cause remains unclear (Volkmar & Wiesner, 2009).

Autism Spectrum Disorders: Interventions and Public Schools

Prior to the passage of the Education for All Handicapped Children Act in 1975 (EHA) many individuals with ASD were placed in residential and large state institutions and only a small portion of this population accessed public education (Volkmar & Wiesner, 2009). Currently, all children have the right to receive a Free Appropriate Public Education under section 504 students with disabilities, in the least restrictive environment possible. Therefore, more than ever, public school systems are the primary site for intervention for individuals with ASD. Furthermore, according to the most recent reauthorization of EHA, the Individuals with Disabilities Educational Improvement Act of 2004 (IDEA 2004), all students with disabilities are expected to have access to the same content standards and general curriculum as other students. Providing access can be challenging for teachers given the unique needs of students with ASD.

There are many different intervention and treatment approaches available to address the academic, behavioral, communication and social skills needs of individuals on the spectrum (e.g., Mash & Barkley, 2006). However, intervention effectiveness remained relatively unclear until 2009 when the National Autism Center released the National Standards Project (NSP) report (NAC, 2009). The NSP expert panel reviewed 775 studies related to the treatment of individuals on the spectrum and categorized each approach based on the level of research-based evidence to support it. Approaches were deemed either (a) "established", the treatment produced beneficial effects and was considered effective, (b) "emerging", a small number of studies found the treatment to produce beneficial effects, however more studies are required, (c) "unestablished", there is little to no evidence regarding the effectiveness of the approach, or (d) "ineffective/harmful", evidence suggested the treatment was ineffective or harmful.

Research indicates that the use of evidence-based practices has significant positive effects on the learning and development of individuals with ASD (e.g., Schwartz & Davis, 2008); and such practices are mandated by No Child Left Behind (NCLB, 2001). However, with so many treatment options available and limited comprehensive reports on the effectiveness of practices, the complex nature of the disorder, and the increasing demands on public schools to provide such services, many questions regarding the education of individuals with ASD remain unknown.

Need for the Project

The increased number of children diagnosed with ASD is a serious concern for families, service providers, and policy-makers, as existing education and other service delivery systems struggle to respond to the educational and other service needs of this population in a comprehensive manner. In 2002 there were nearly 120,000 school-age children classified with ASD nationwide, which increased from only 20,000 in 1993 (CDC). Today, over 11,000 students with ASD are served in educational settings across the state of Michigan alone. The cost to such institutions continues to be a source of concern. A study by the Special Education Expenditure Project (conducted for the U. S. Department of Education) found that ancillary services for students with ASD cost nearly $19,000 a year per student, which is triple

the cost for a typical student. Additionally, some districts spent $75,000 per student per year on intensive services for students with ASD (Chambers, Shkolnik, Pérez, 2003).

Although the law requires school districts to provide a Free Appropriate Public Education in the least restrictive environment and evidence-based practices are mandated, the extent to which school professionals are trained in effective practices and administer them to individuals with ASD in the public school setting in the state of Michigan remains unclear. Additionally, parents' satisfaction with the current state of education for their children with ASD remains unknown. Therefore, this study intended to address the following research questions:

1. What is the nature of instructional services provided to students with ASD across Michigan?
    a. What are the instructional targets and expectations for students with ASDs receiving special education (i.e., to what achievement standards are they working, do they have academic goals, social goals, and/or behavioral goals)?
    b. What is their level of inclusion in the general education classroom?
    c. What is their exposure to the general curriculum?
    d. Which specific programs are being used (e.g., TEACHH)?
    e. Which specific instructional strategies are being used (e.g., social stories)?

2. Are the services provided to students with ASD in Michigan similar to those that have been identified as effective through a review of the research literature?

3. What are parent perspectives on the nature of educational services provided to students with ASD in Michigan?
    a. To what extent are they satisfied or dissatisfied with the current services being provided?
    b. To what extent have they advocated for better services for their child?

4. Does the nature of instruction provided to students with ASD in Michigan vary according to various characteristics across the state?
    a. High/Middle/Low SES
    b. Regional differences (West, East, Mid-, Upper Peninsula)

5. What training is obtained by or provided to those who provide educational services and support to students with ASD in Michigan?
    a. General educators
    b. Special educators
    c. Paraprofessionals/teacher aides

Method

Sample Development

To ensure that the data we collected and summarized adequately represented the educational services provided to students with ASD across Michigan, we initially sought to identify a representative sample of students with ASD across the state, and to contact the school professionals and parents of these students for information. Recognizing that systematic information may only be available for those receiving special education services (and not those simply on 504 plans or those not deemed eligible for special education services), we planned to limit our sample to those students receiving special education services. However, no statewide dataset was available that would allow us to select and contact individual students with ASD. A statewide dataset containing names and school districts of public school special education personnel was available, therefore we decided to sample from this dataset. Information on special education teachers was obtained from the Registry of Educational Personnel (REP), a dataset provided to the Michigan Department of Education by the Center for Educational Performance and Information (CEPI) within the Office of State Budget. In addition, data were made available by the Michigan Department of Education that included the number of students with ASD served in each intermediate and local school district in Michigan[1]. We sought to create two matched samples of 500 special education personnel that corresponded with a distribution of students with ASD across the state. In other words, we wanted to select more teachers to participate from intermediate school districts (ISDs) and local school districts where there were more students with ASD, and fewer teachers where there were fewer students with ASD.

Determining which teachers to sample was challenging because of the many different types of special educators who serve students with ASD. Two special education assignments included in the REP dataset that were clearly related to students with ASD included "Autistic Impaired" (AI teachers) and "Teacher Consultant: Autistic Impaired" (AI consultants). Therefore, we included all of the AI teachers and AI consultants that were in the database in our sample. Next, we selected additional special education teachers for two reasons. First, we had reason to believe based on experience in public school settings and informal interactions with parents and educators that many students with ASD are provided special educational services by individuals who have not received undergraduate or graduate training in ASD specifically, and who do not have the titles mentioned above. Students with ASD may be served by those with endorsements in areas other than ASD. Second, the sum of all AI teachers and consultants in Michigan was less than our intended sample size.

The additional special education assignments who we decided to include in our sample were quite comprehensive, given that students with ASD may be served by a variety of different categories of special educators. We included the following categories of special educators (category titles were specifically drawn from the REP dataset): "Mildly Cognitively Impaired," "Moderately Cognitively Impaired," "Severely Cognitively Impaired," "Emotionally Impaired," "Learning Disabled," "Hearing Impaired," "Visually Impaired," "Physically Impaired or Otherwise Health Impaired," "Severely Multiply

[1] Note. If fewer than 10 students with ASD were enrolled in a given district, the number was not provided.

Impaired," "Preprimary Impaired," "Speech/Language Impaired," "Resource Room," and "Physical Education for the Handicapped." We used a systemic sampling strategy to select these additional special education teachers from districts where the number of AI teachers and consultants were proportionally lower than expected when considering the number of students with ASD in those districts. That is, it was based on a list of these other special education teachers in which every *n*th teacher was selected until we reached our intended sample size such that the proportion of teachers in the sample from various regions matched the proportion of students with ASD from those regions.

Each of the resulting samples (the sample of AI teachers, the sample of AI consultants, and the sample of other special education teachers) was split into two matched samples, i.e., the primary sample and the secondary sample. After each sample was sorted by last name and again by district, every first person went to the primary sample, and every second person to the secondary sample. All of the primary samples combined together constituted our total primary sample, and all secondary samples combined together constituted our total secondary sample.

To assess the extent to which the distribution of our total samples of teachers was consistent with the distribution of students with ASD across the state of Michigan, we compared the distributions across Michigan's ISDs. We decided to compare the distributions across ISDs rather than across districts because it was sometimes the case that students with ASD were served at the ISD level rather than at the district level. The correlation between the number of our total sample and the number of students with ASD across ISDs was over .9 for both primary and secondary samples, indicating that the distribution of our sample was highly consistent with the distribution of ASD students. After we slightly adjusted our sample to correct some oversampled or undersampled ISDs, the resulting correlation was over .95 for both primary and secondary samples.

We decided to use the REP dataset from the year prior to when data collection was intended to occur because (a) the REP dataset that we used is not available early in a given school year, and (b) our design was intended to allow us to collect information from a variety of individuals through both survey and observation. Unfortunately, many school professionals change positions, schools, and districts over the summer. For this reason, we included an additional step that involved asking those who we contacted to provide us other names in the case that they were no longer with the given district or no longer serving as a special education professional.

Recruiting Procedures

Special educators and consultants. We sought out contact information for the special education personnel represented in our primary and secondary samples through school district websites. Each member of the primary sample was emailed a short description of the study and a link to participate in an online survey. If a member of the primary sample was not able to be contacted, we sought out a special education professional who served in the same district. If a member of the primary sample reported not serving a student with ASD, we asked the individual to provide the name and contact information of a special education professional in the school building or ISD who did. If a member of the primary sample did not respond to our survey request within our approximately one month window of

time, we contacted the individual matched to that member who was included in the secondary sample.

Among those who responded, we asked each to select one student with ASD with whom they currently worked who met the following criteria:

- Was enrolled in a public school in a grade inclusive of kindergarten through 12th grade
- Had a last name that began with the letter closest in the alphabet but after the last name of the responding special education professional
  This allowed us to be sure that participants were relatively random in their selection of a student to report about, and were not biased in their reporting in terms of systematically selecting a student who was the most or least challenging. We never collected identifying information about the student without parent permission that occurred in later recruitment efforts discussed below.

The respondents were offered $15 for their participation.

Additional special educators, general educators, paraprofessionals, and parents. At the end of the survey, we asked the special education respondent to forward information about the study to the selected student's parent(s) in order to recruit parents of the same students who were reported about in the school professional survey. In addition, we asked special education respondents to forward information about the study to any general education teacher, special education teacher, or teacher assistant/paraprofessional who worked with the selected students, and to follow-up with these additional school professionals about which student they reported on so that these additional school professionals could respond about the same targeted student. These other school professionals could then contact us to participate in the school professional survey, and we could match their data with the special educator/consultant data for the targeted student. In this way, we attempted to get a comprehensive picture of the services provided to a representative sample of students with ASD in Michigan from multiple respondents (i.e., special educators, general educators, parents, teacher assistants/paraprofessionals). Again, respondents were offered $15 for their participation.

Unfortunately, this method resulted in a very limited recruitment of parent participants. We originally sought to only collect parent responses for those students for whom we also had connected information from school professionals. We therefore sent reminders to participating teachers to forward information about the opportunity to participate to parents. However, because information about students who have ASD in a school is confidential information, we could not directly contact these parents and had to rely on participating teachers to contact them. After these additional reminder efforts a very limited parent sample remained; therefore, we decided to advertise the study through various parent advocacy groups and through school district newsletters, which resulted in the recruitment of a few more parent participants. We then asked these parents to forward information about the study to their child's teachers in an attempt to obtain matched information. However, these teacher respondents were not included in our school professional samples given that they were not part of the original sampling process.

Observation recruitment. At the end of each survey, participants were asked about their willingness to

participate in follow-up observations in which a member of the research team would visit the student's classroom(s) and complete a structured observation. In the case that a parent, and corresponding teacher, and school district agreed to observations, we collected data through observation for the particular student. Given that there were so few parent respondents, we ended up observing only the general classroom dynamics in cases where teachers and school districts (and not parents) agreed to observations.

School Professional Survey

In order to inform the development of the school professional survey, we conducted a comprehensive review of empirical literature on educational services and interventions provided to students with ASD We wanted to ensure that our inquiry about interventions and services provided was all-inclusive. Additionally, we examined other survey studies that had been conducted, including the Special Education Elementary Longitudinal Study (SEELS). In designing the survey, we included the following sections:

(1) General background information on the school professional
(2) General background information on the student with ASD
(3) Nature of educational services provided to the student with ASD
(4) Learning expectations for the student with ASD
(5) Services provided to the student with ASD (Academics, Functional Skills, Social Skills, Developmental and Relationship Interventions, Peer-Based Strategies, Self-Management Strategies, Augmentative or Alternative Communication, Technology, Physiological, Other)

Unfortunately the NSP report (mentioned in the introduction section) was not published until after we developed and administered our survey; therefore, the intervention services we included on the survey do not directly align with the language used to categorize interventions according to the NSP report.

The survey was administered via a web-based interface, and piloted with eight school professionals (3 special educators, 3 general educators, and 2 paraprofessionals). Minor revisions were made based on their feedback prior to administration. Survey administration was estimated to take approximately 25 minutes.

Parent Survey

The parent survey was designed to address the following categories of information:

(1) Parent background information
(2) Characteristics of the child
(3) School expectations and services provided to the child
(4) Out of school services provided to the child

The survey was also administered via a web-based interface, piloted with three parents of children with

ASD, and associated revisions were made. The parent survey took approximately 10 minutes for parents to complete.

Observational Procedures

A protocol for observations was developed and piloted in a classroom. Information was collected about the type of classroom(s) in which the student was taught during the observation (general vs. special), an estimate of the student's exposure to the general curriculum during the observation, the use of a variety of services and support during the observation, and various student and teacher behaviors (e.g., praise statements, interactions with peers, rewards delivered, use of social stories, etc.). Graduate research assistants practiced the protocol until they reached 80 % similar responses on the protocol (see Appendix A).

Survey of Special Education Programs at Institutes of Higher Education (IHEs) in Michigan

A sample of fourteen institutes of higher education (IHE) in Michigan that provide pre-service training to special educators was created. We developed the sample to include those involved in a collaborative effort to provide training to educators in addressing the needs of students with ASD, and those that did not belong to this effort. We also attempted to include universities of varying enrollments in the sample. Special education program directors at the selected fourteen universities were contacted by phone and with a follow-up email to encourage their participation in the web-based survey. The survey included questions about numbers of faculty, faculty expertise in ASD, endorsements offered, program requirements, program graduates, and theoretical orientations of program faculty.

Results

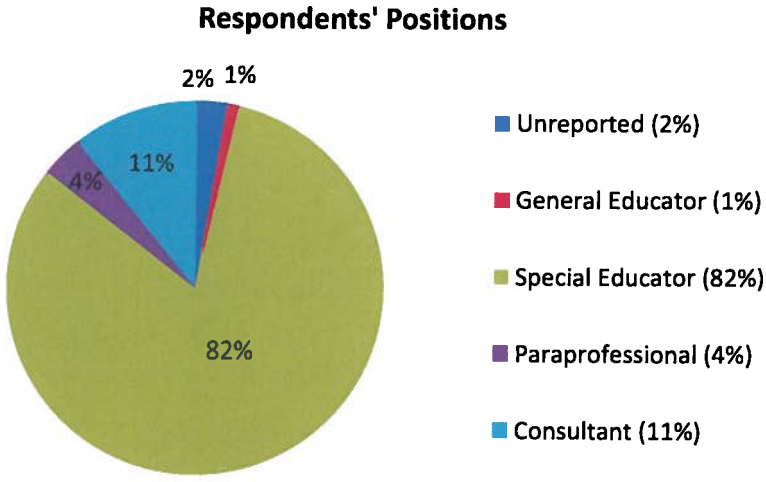
Research Question 1:
What is the nature of instructional services provided to students with ASD across Michigan?

Demographic information on education personnel in respondent sample.

In order to address questions about the nature of instructional services provided to students with ASD across Michigan, we selected one respondent from the multiple respondents who may have reported about a targeted student for inclusion in the analyses described for this research question. Because we sought information about a single student from a special educator, consultant, general educator, and paraprofessional, we needed to select just one type of individual to conduct the related analyses. This way, students were not represented twice in our reporting of the results. If a special educator had responded about the target student, we used that respondent's data to address this question. However, if a special educator did not respond, we used the special education consultant who reported about that student. In some cases, neither a special educator nor consultant completed the survey, therefore we selected the general educator or paraprofessional associated with the target student. These personnel may have been the only individuals who responded for a target student in that a special educator from our sample who was contacted asked a paraprofessional or general educator to complete the survey on his/her behalf, or because the special educator in the original sample (which was determined based on the previous school year data) had changed positions and was now working as a general educator.

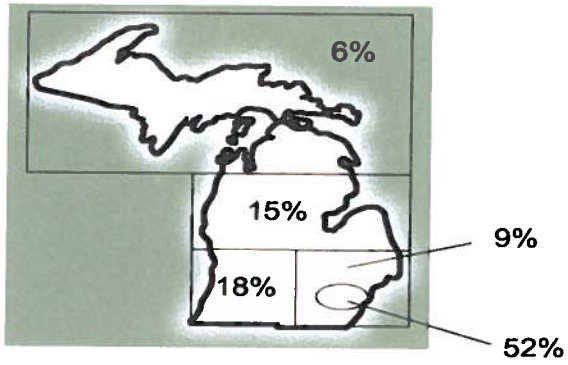
In this way, responses from a total of 194 education professionals associated with our original primary and secondary special education samples were selected for inclusion in the analyses associated with the first research question. Given lack of responses from individuals from our primary sample of 522 individuals, 224 individuals were contacted from the secondary sample. The proportion of personnel who responded and met criteria by reporting on a k-12 student with ASD receiving public school services and were included in this analysis therefore represented 26% of the intended sample.

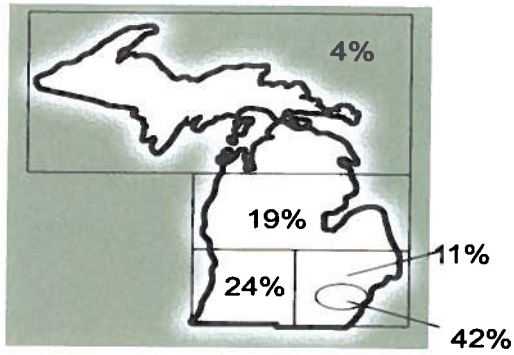
The composition of educational personnel who were included in the analysis results was as follows:



We intended to represent services provided across the state as accurately as possible; therefore, we compared our respondents' district characteristics to those in the original primary sample in terms of category of median household income (high, medium, and low) and geographic region. Our sample was just slightly higher in terms of those from school districts in counties categorized as having a medium median household income (33% of our respondents worked in these counties; whereas 25% of our planned sample worked in these counties), and lower in terms of those from school districts in counties categorized as high (27% of our respondent sample vs. 31% of our planned sample) and low (40% of our respondent sample vs. 44% of our planned sample) median household income. In terms of geographic region, our respondent sample quite closely resembled our planned sample with the exception that we had a slightly greater proportion of respondents from the southwest and less from the tri-county area than planned. The table and figures below show the proportion of individuals from various geographic regions in Michigan in our planned sample and respondent sample.

County Median Household Income	**Respondent Sample**	**Planned Sample**
Low	40%	44%
Medium	33%	25%
High	27%	31%
Geographic Region	**Respondent Sample**	**Planned Sample**
Southeast (*excluding Tri-County Area*)	11%	9%
Southwest	24%	18%
Tri-County Area (*Oakland, Macomb, Wayne*)	42%	52%
Thumb/Mid-Michigan	19%	15%
Northern/Upper Peninsula	4%	6%





Planned Sample **Obtained Sample**

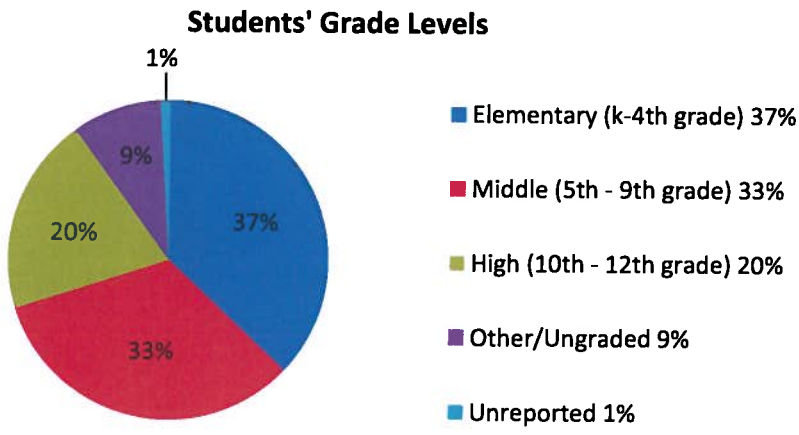
Overall, this information suggests that our sample does include and satisfactorily represent responses from across the state.

Background information on students.

Each of the 194 respondents responded about a particular student with ASD with whom they worked. Of these students, 79% were reported to be male, which matches the commonly reported 4:1 male/female ratio for the disorder. The breakdown according to reported diagnosis was as follows:

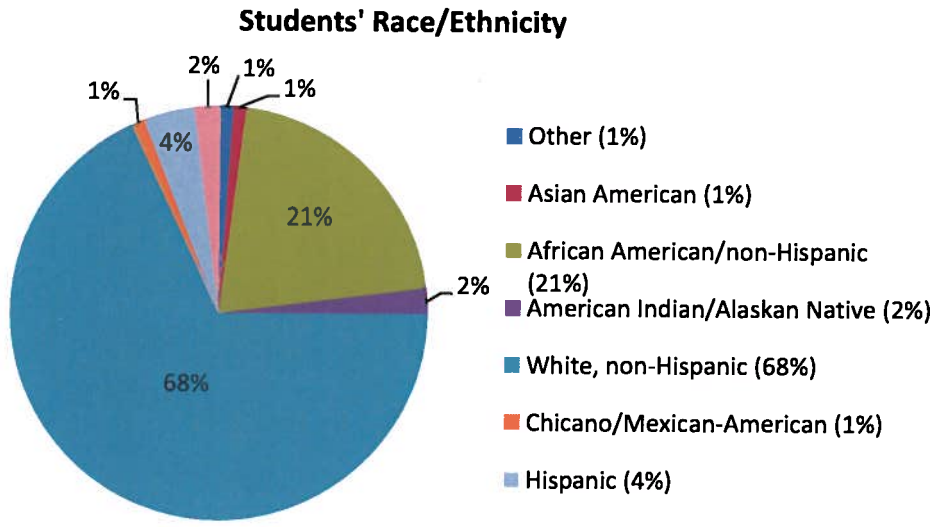
Diagnosis Category	Percent
Autism Disorder	79%
Asperger's Syndrome	10%
Pervasive Developmental Disorder, Not Otherwise Specified (PDD-NOS)	1%
Rett's Disorder/Childhood Disintegrative Disorder	0%
Respondent Reported "Don't Know"	8%
No Response	2%

The grade levels of students on whom professionals reported was as follows:



Results therefore represent a variety of grade levels.

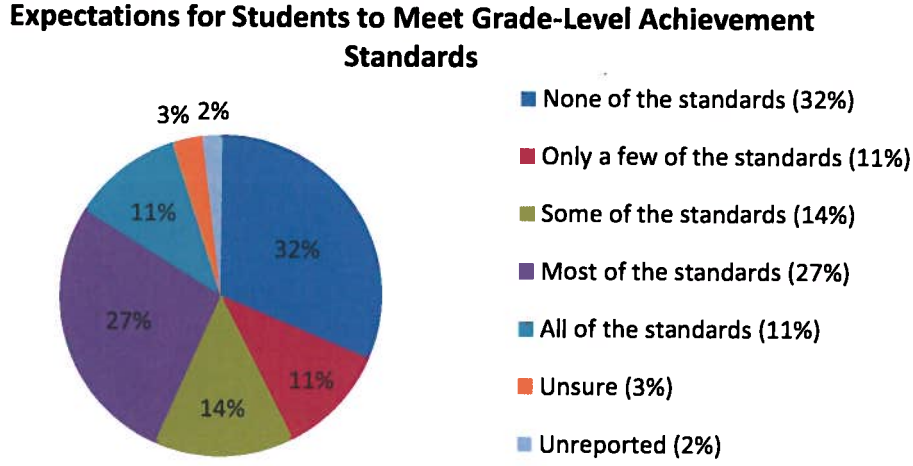
Although the students were primarily white, a range of student races/ethnicities was included.



Thirty-one percent of the students were reported as receiving free- or reduced-price lunch.

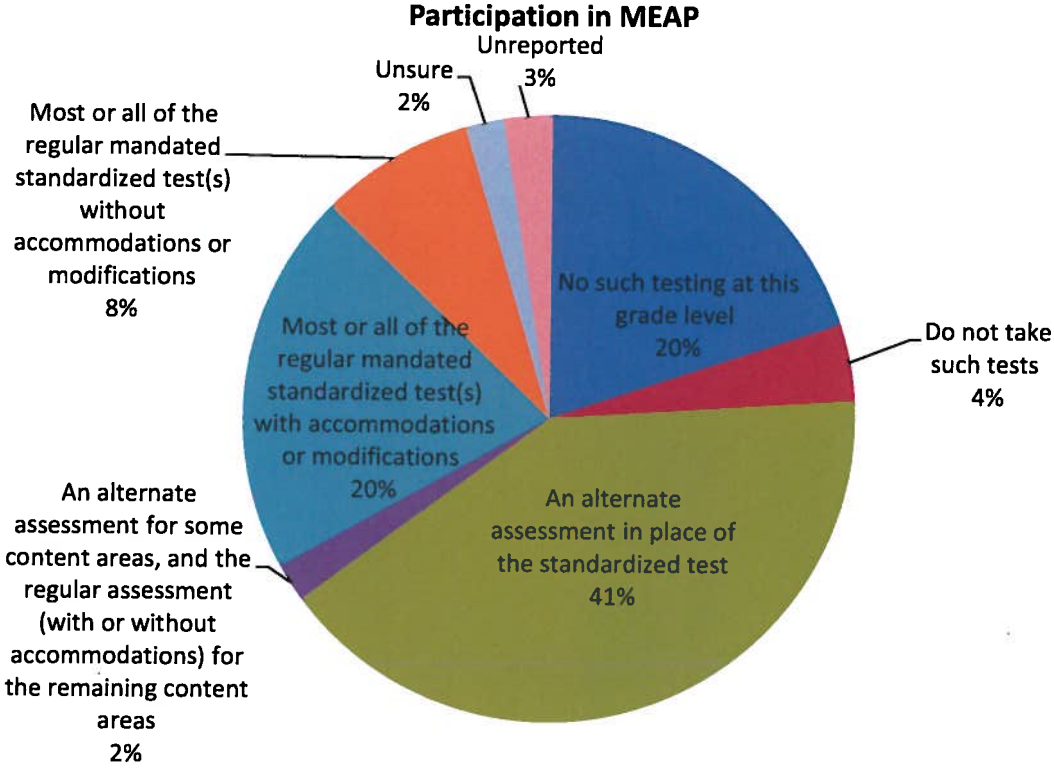
What are the instructional targets and expectations for students with ASD receiving special education?

To address this question, we asked respondents to report on the extent to which the targeted student was expected to reach grade-level achievement on the academic content standards. Only 11% of the respondents expected the student to reach grade-level achievement on all of the standards, with the greatest proportion expecting them to meet none of the grade-level achievement standards.



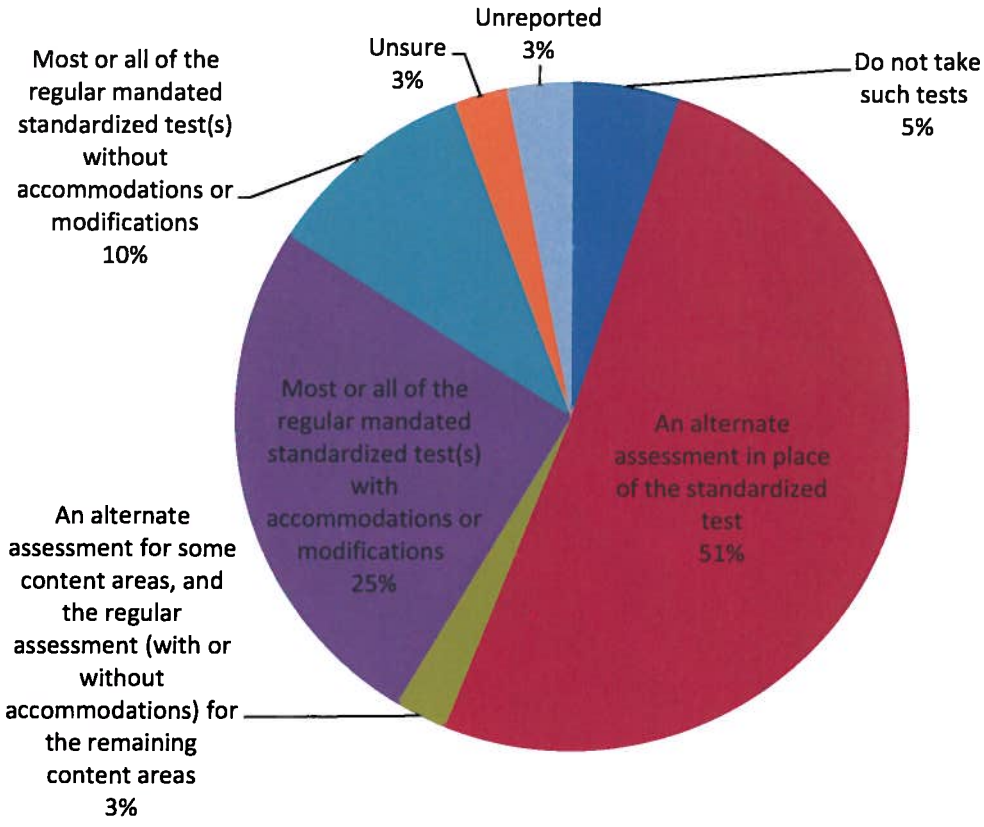
We also asked respondents to report on the nature of Individualized Education Plan (IEP) goals for the targeted students. These represent the areas in which students are considered to need specialized instruction given their disability. The most common IEP goal areas were "building social skills" (74%), "improve appropriateness of behavior" (65%), "improve speech" (63%), and "improve functional skills" (56%). Less common goal areas included "improve overall academic performance" (44%), "improve academic performance in specific areas" (15%).

Respondents were also asked to report how the student was expected to participate in the Michigan Educational Assessment Program (MEAP). This provides another indicator of whether teachers expected students to meet grade-level achievement standards.



To account for the fact that some grade levels do not include MEAP testing, the following chart presents the same information, but more accurately represents how students were reported to be distributed according to MEAP participation options.

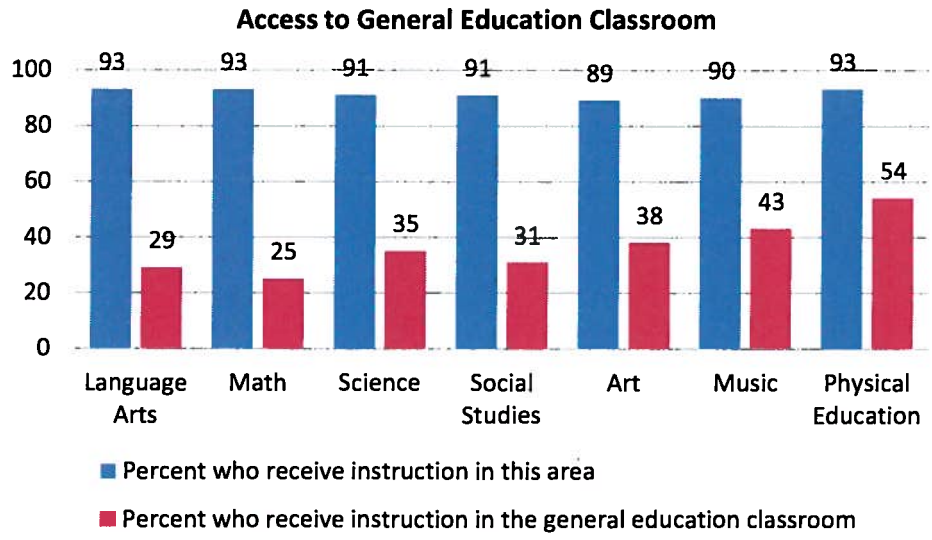
Participation in MEAP
(not including students reported to be in a grade not tested by the MEAP)



The majority of students (51%) were reported to participate only in the alternate assessment; 35% were reported to participate in the regular assessment with or without accommodations or modifications. Others (3%) participated in a combination of the above. Five percent (5%) were reported to not participate at all.

What is their level of inclusion in the general education classroom?

We asked respondents to report on whether or not the targeted students received instruction in specific content areas, as well as where they received that instruction (e.g., special education classroom, general education classroom, etc.). Results are provided below for several selected areas. Although over 90% of students were generally reported to receive instruction in the given areas, only approximately a third tended to receive that instruction in the general education classroom. More students tended to receive instruction in the general education classroom in special areas (i.e. art, music, and physical education).



Overall, 67% of the targeted students were reported to receive at least some instruction in the general education classroom. The 64 students who were reported to not have access to any instruction in a general education classroom were from a variety of grade levels, including elementary (k – 4th grade; N = 13), middle (5th – 9th grade; N = 19), and high school (10th – 12th grade; N = 8) with the remaining in ungraded (N = 15) or unreported grade level information (N = 9).

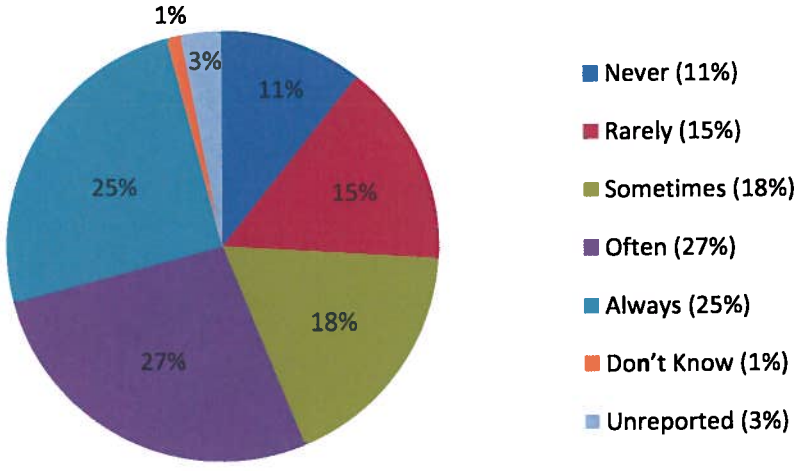
Respondents were also asked to report on whether, and how often, students received certain special services. These are reported in the table below. The most common service of those examined was speech/language services, which 71% of students were reported to receive. Of the 71% who received services through a self-contained classroom, the average amount of time students spent there per week was less than one hour.

Service	Percentage of Targeted Students	Average Number of Hours/Week Among Those Who Received the Given Service
Self-contained Classroom	58%	24 hours
Resource Classroom	24%	9 hours
One-on-one Paraprofessional	36%	13 hours
Speech/Language Services	71%	0.8 hours

What is their exposure to general curriculum?

Special education respondents were asked to report on how often the student worked with curriculum and/ or materials designed for students receiving general education services. About half were reported to "often" or "always" work with curriculum and/or materials designed for students receiving general educational services.

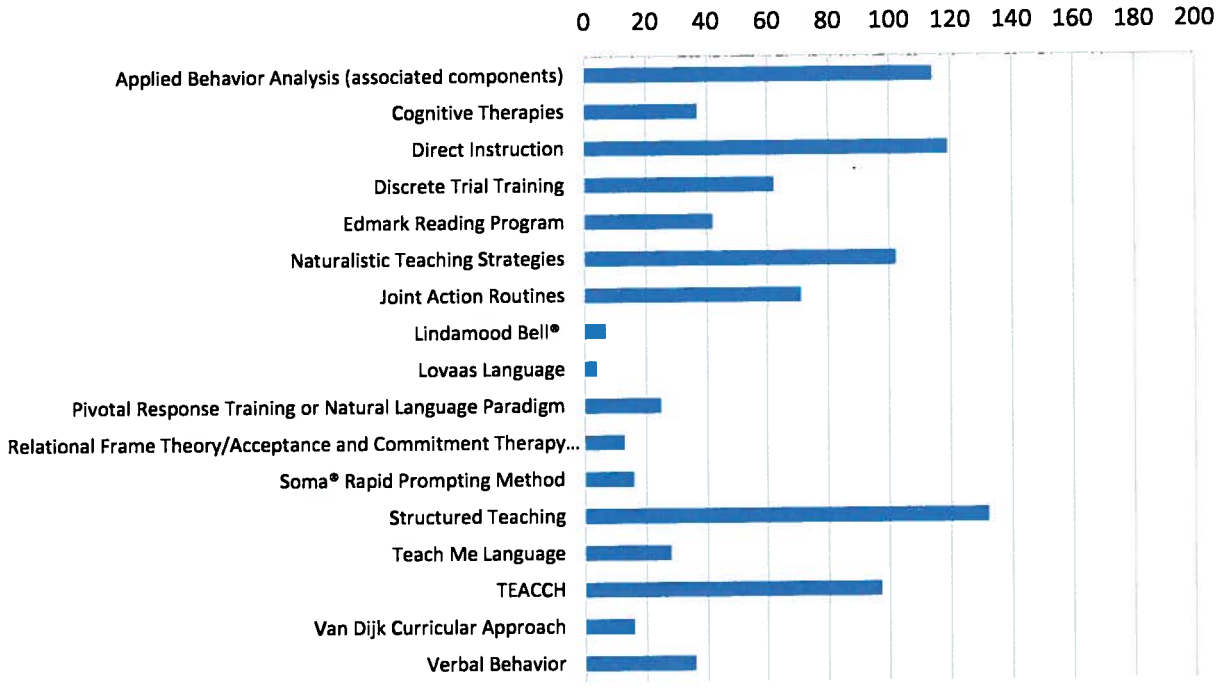
Exposure to General Curriculum



What are the specific programs and strategies used?

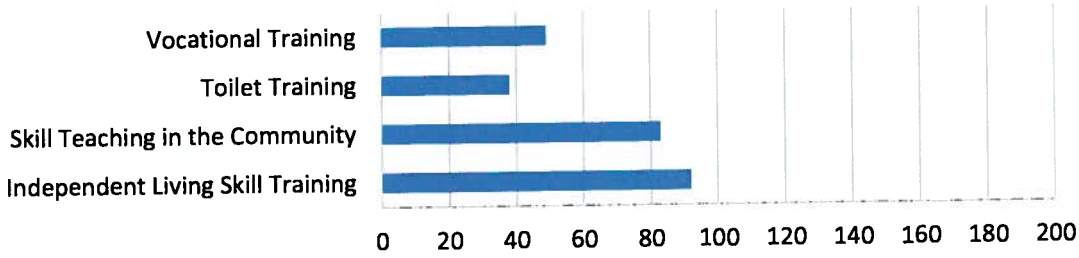
We asked the respondents to report on whether they provided a variety of services to the targeted students. These were selected based on a comprehensive literature review of approaches and practices used with students with ASD. The results are provided in the following figures.

Academic Skills:
Number of Respondents Reporting Use for Target Student

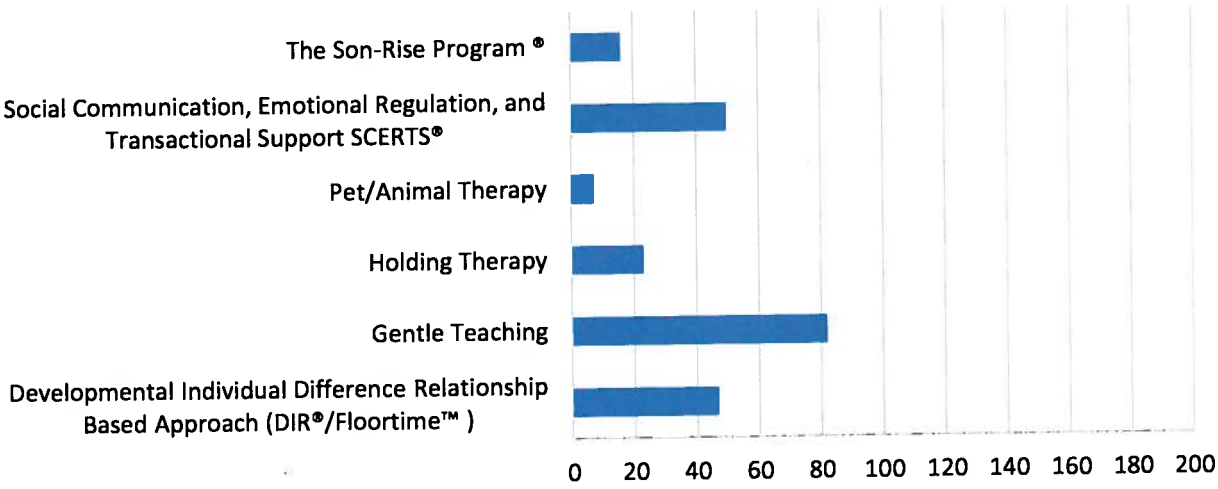


The most common academic practices reported as being used for target students were structured teaching (N = 132), direct instruction (N = 119), and applied behavior analysis (N = 114). Other interventions that many respondents reported using for their target students included Social Stories ™ (N = 109), and visual supports and strategies (N = 134).

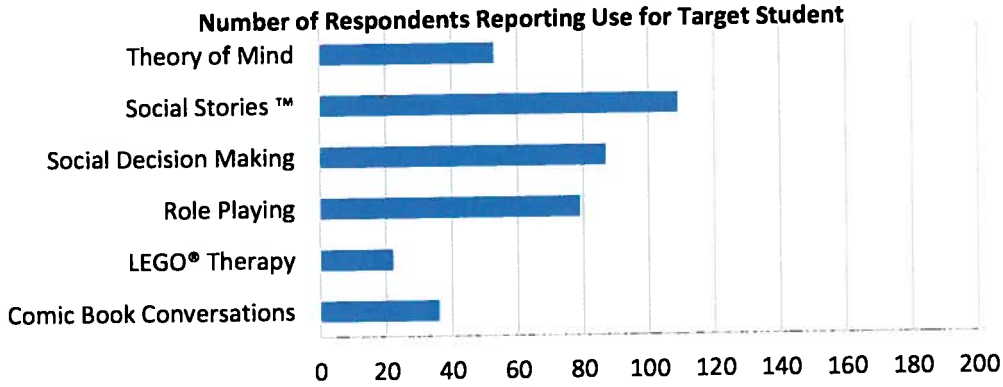
Functional Skills:
Number of Respondents Reporting Use for Target Student



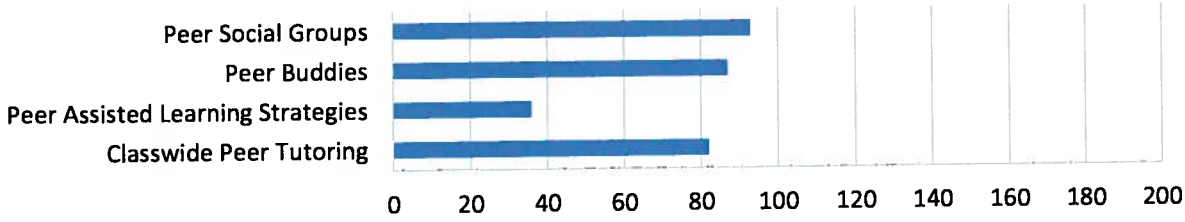
Developmental and Relational Interventions:
Number of Respondents Reporting Use for Target Student



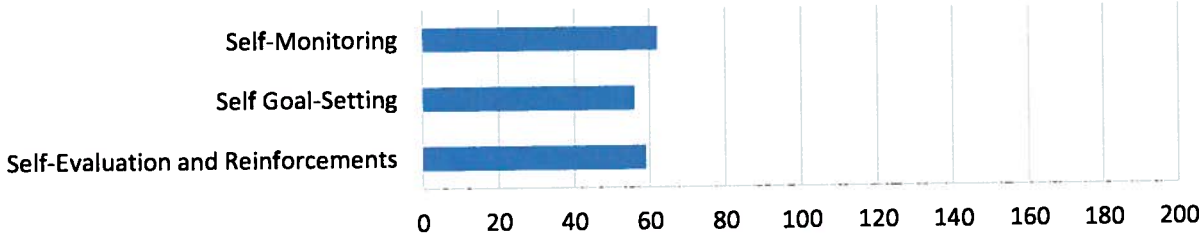
Social Skills:
Number of Respondents Reporting Use for Target Student



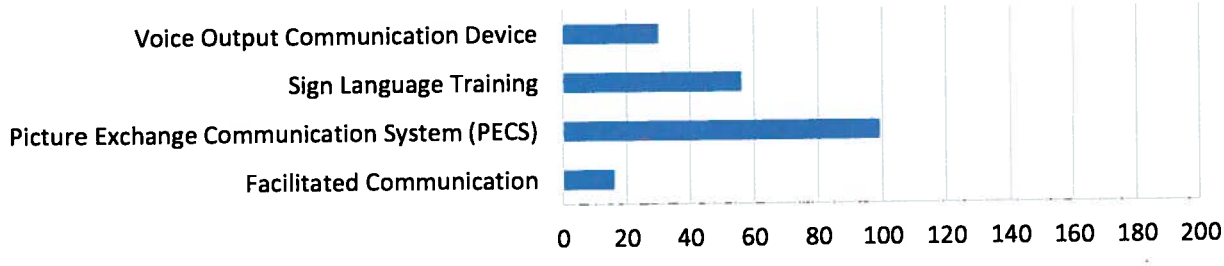
Peer-Based:
Number of Respondents Reporting Use for Target Student



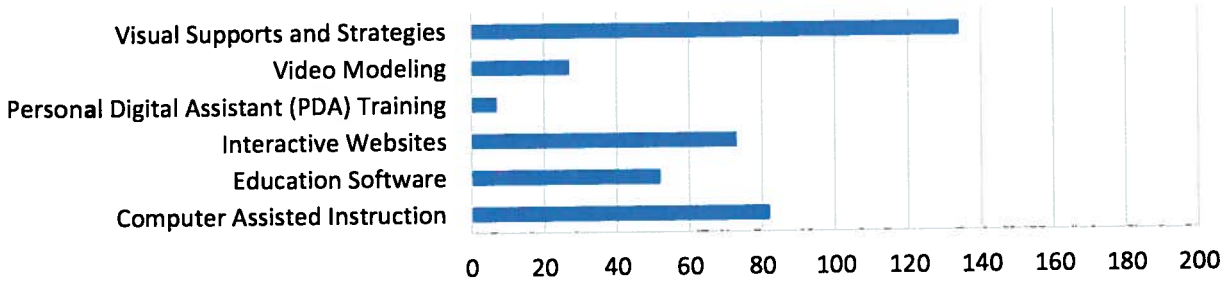
Self-Management:
Number of Respondents Reporting Use for Target Student



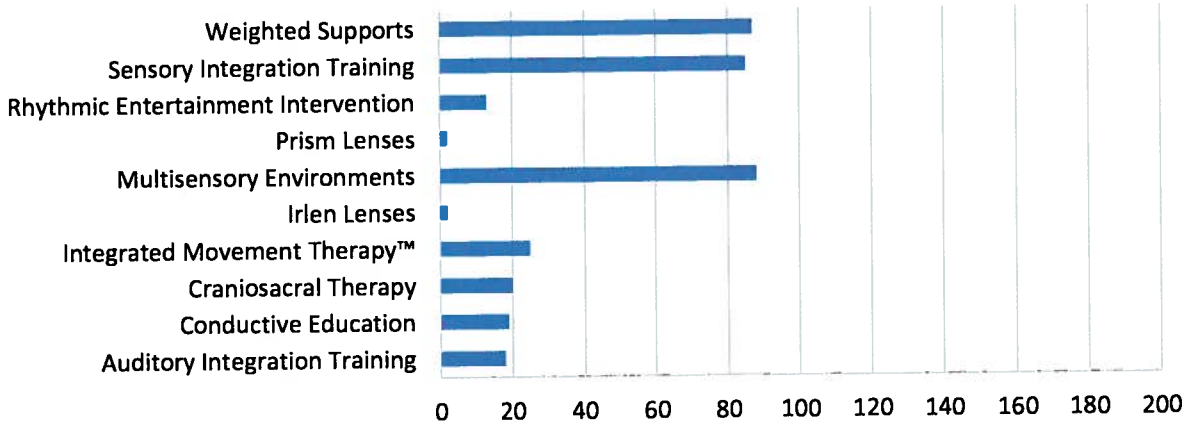
Augmentative or Alternative Communication:
Number of Respondents Reporting Use for Target Student



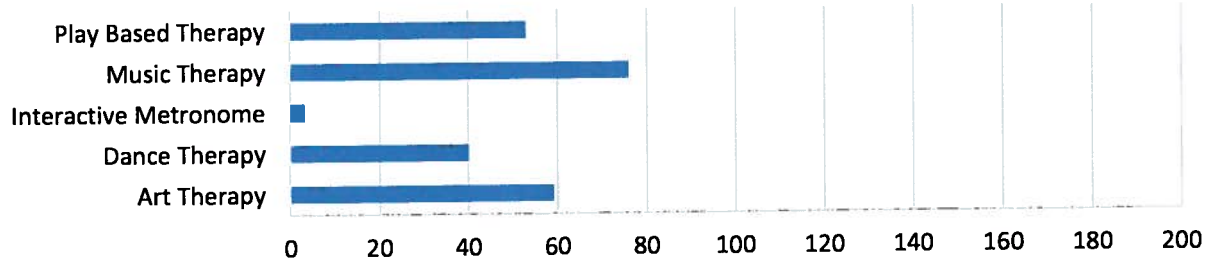
Technology:
Number of Respondents Reporting Use for Target Student



Physiological:
Number of Respondents Reporting Use for Target Student



Other:
Number of Respondents Reporting Use for Target Student



Research Question 2

Are the services provided to students with ASD in Michigan similar to those that have been identified as effective through a review of the research literature?

A comprehensive review of empirical literature on educational services and interventions provided to students with ASD was conducted in order to ensure that inquiries to school professionals about interventions, strategies, techniques, and approaches were all-inclusive. The list included 65 different approaches (listed above), including those with and without strong empirical support. Respondents indicated whether or not they used the approach with the student with ASD. Subsequently, two independent reviewers with extensive knowledge in ASD, analyzed the approaches against the National Standards Project (NSP; NAC, 2009) and the National Professional Development Center (NPDC) on ASD (http://autismpdc.fpg.unc.edu/content/evidence-based-practices) to determine which of the approaches would be considered most effective based on these comprehensive reports.

The NSP was a systematic review of 775 peer-reviewed articles involving individuals with ASD. The NSP developed a classification system that included four categories, "established", "emerging", "unestablished", and "ineffective/harmful" (see Appendix C). The NPDC on ASD has identified 24

evidence-based practices by using stringent criteria to determine an approach's efficacy (see Appendix C). Based on the classification system of these two entities, we determined the efficacy levels of the 65 listed approaches used by school professionals.

Approaches reported on school professional survey determined to be established, emerging, or an evidence-based practice based on NSP or NPDC on ASD reports.

Practice	Number (Percentage) Reported Use for Target Student	NSP	NPDC on ASD
Established, Emerging or Evidence-Based Practice: Academic			
Applied Behavior Analysis	114 (59%)	Established (antecedent or behavioral package)	EBP (antecedent package, DR, extinction, FBA, FCT, prompting, task analysis, reinforcement)
Cognitive Therapies	37 (19%)	Emerging (cognitive behavioral intervention package)	Not listed
Discrete Trial Training	62 (32%)	Established (behavioral package)	EBP
Naturalistic Teaching Strategies	102 (53%)	Established	EBP
Pivotal Response Training or Natural Language Paradigm	25 (13%)	Established	EBP
Structured Teaching	132 (68%)	Emerging	EBP (structured work stations)
Treatment and Education of Autistic and Communication related handicapped Children (TEACCH)	97 (50%)	Emerging (structured teaching)	EBP (structured teaching)
Established, Emerging or Evidence-Based Practice: Social			
Social Stories™	109 (56%)	Established (story based intervention package)	EBP (social narrative)
Theory of Mind	53 (27%)	Emerging	Not listed
Established, Emerging or Evidence-Based Practice: Developmental/Relational			
Developmental Individual Difference Relationship Based Approach	47 (24%)	Emerging	Not listed

(DIR®/*Floortime*™)			
Social Communication, Emotional Regulation, and Transactional Support (SCERTS®)	50 (26%)	Emerging (developmental relationship-based treatment)	Not listed
The Son-Rise Program®	16 (8%)	Emerging (developmental relationship-based treatment)	Not listed
Established, Emerging or Evidence-Based Practice: Peer-Based			
Peer Tutoring	82 (42%)	Emerging (peer-mediated instructional arrangement)	EBP (peer-mediated instruction and intervention)
Peer Assisted Learning Strategies (PALS)	36 (19%)	Emerging (peer-mediated instructional arrangement)	EBP (peer-mediated instruction and intervention)
Peer Buddies	87 (45%)	Established (peer training package)	EBP (peer-mediated instruction and intervention)
Peer Social Groups	93 (48%)	Established (peer training package)	EBP (peer-mediated instruction and intervention)
Established, Emerging or Evidence-Based Practice: Self-Management			
Self-Evaluation and Reinforcement	59 (30%)	Established (self-management)	EBP
Self-Goal Setting	56 (29%)	Established (self-management)	EBP
Self-Monitoring	62 (32%)	Established (self-management)	EBP
Established, Emerging or Evidence-Based Practice: Augmentative Alternative Communication			
Picture Exchange Communication System (PECS)	99 (51%)	Emerging (AAC)	EBP
Sign Language Training	56 (29%)	Emerging (AAC)	Not listed
Voice Output Communication Device	30 (15%)	Emerging (AAC)	EBP
Established, Emerging or Evidence-Based Practice: Technology			
Computer Assisted Instruction	82 (42%)	Emerging (technology-based treatment)	EBP (computer aided)
Education Software	52 (27%)	Emerging (technology-based treatment)	EBP (computer aided)

Interactive Websites	73 38%)	Emerging (technology-based treatment)	EBP (computer aided)
Personal Digital Assistant (PDA) Training	7 (4%)	Emerging (technology-based treatment)	EBP (computer aided)
Video Modeling	27 (14%)	Established	EBP
Visual Supports or Strategies	134 (69%)	Not listed	EBP
Established, Emerging or Evidence-Based Practice: Other			
Dance Therapy	40 (21%)	Emerging (exercise)	Not listed
Music Therapy	76 (39%)	Emerging	Not listed

Approaches reported on school professional survey, determined to be unestablished based on NSP report.

Practice	Number (Percentage) Reported Use for Target Student	NSP	NPDC on ASD
Unestablished: Augmentative Alternative Communication			
Facilitated Communication	16 (8%)	Unestablished	Not listed
Unestablished: Physiological			
Auditory Integration Training	18 (9%)	Unestablished	Not listed
Sensory Integration Training	85 (44%)	Unestablished	Not listed

Approaches reported on school professional survey, that were not specifically listed by either the NSP or NPDC on ASD reports.

Practice	Number (Percentage) Reported Use for Target Student	NSP	NPDC on ASD
Not Specifically Listed in Either NSP or NPDC on ASD: Academic			
Direct Instruction	119 (61%)	Not listed	Not listed
Edmark Reading Program	42 (22%)	Not listed	Not listed
Joint Action Routines	71 (37%)	Not listed	Not listed
Lindamood Bell®	7 (4%)	Not listed	Not listed
Lovaas Language	4 (2%)	Not listed	Not listed
Relational Frame Theory or Acceptance and Commitment Therapy	13 (7%)	Not listed	Not listed

Soma® Rapid Prompting Method	16 (8%)	Not listed	Not listed
Teach Me Language	28 (14%)	Not listed	Not listed
Van Dijk Curricular Approach	16 (8%)	Not listed	Not listed
Verbal Behavior	36 (19%)	Not listed (components of this approach, e.g., mand training, contriving MOs, are under antecedent and behavioral package)	Not listed
Not Specifically Listed in Either NSP or NPDC on ASD: Functional			
Independent Living Skill Training	92 (47%)	Not listed	Not listed
Skill Teaching in the Community	83 (43%)	Not listed	Not listed
Toilet Training	38 (20%)	Not listed	Not listed
Vocational Training	49 (25%)	Not listed	Not listed
Not Specifically Listed in Either NSP or NPDC on ASD: Social			
Comic Book Conversations	36 (19%)	Not listed	Not listed (Social narratives)
LEGO® Therapy	22 (11%)	Not listed	Not listed
Role Playing	79 (41%)	Not listed	Not listed
Social Decision Making	87 (45%)	Not listed	Not listed
Not Specifically Listed in Either NSP or NPDC on ASD: Developmental/Relational			
Gentle Teaching	82 (42%)	Not listed	Not listed
Holding Therapy	23 (12%)	Not listed	Not listed
Pet/Animal Therapy	7 (4%)	Not listed	Not listed
Not Specifically Listed in Either NSP or NPDC on ASD: Physiological			
Conductive Education	19 (10%)	Not listed	Not listed
Craniosacral Therapy	20 (10%)	Not listed	Not listed
Integrated Movement Therapy™	25 (13%)	Not listed	Not listed
Irlen Lenses	2 (1%)	Not listed	Not listed
Multisensory Environments	88 (45%)	Not listed	Not listed
Prism Lenses	2 (1%)	Not listed	Not listed
Rhythmic Entrainment Intervention™	13 (7%)	Not listed	Not listed
Weighted Supports	87 (45%)	Not listed	Not listed
Not Specifically Listed in Either NSP or NPDC on ASD: Other			
Art Therapy	59 (30%)	Not listed	Not listed
Interactive Metronome	3 (2%)	Not listed	Not listed
Play Based Therapy	53 (27%)	Not listed	Not listed

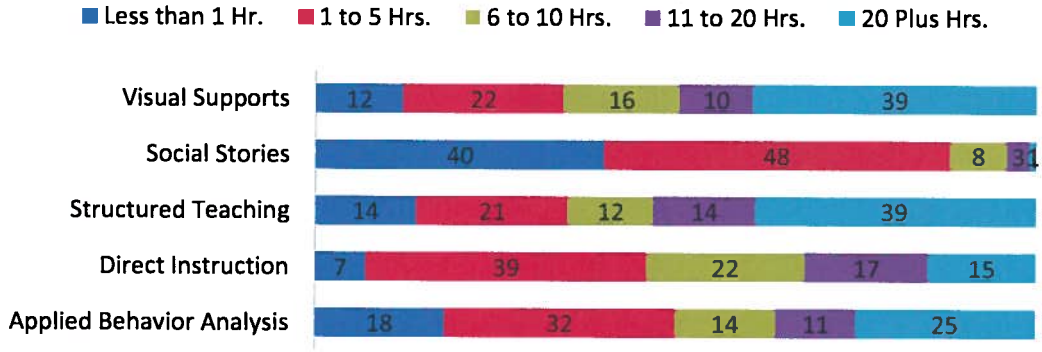
The five most highly reported practices and reported weekly use.

The five most highly reported practices were visual supports (69%), structured teaching (68%), direct instruction (61%), applied behavior analysis (59%), and social stories (56%). Of these five most used practices, all were reported by either NSP or NPDC on ASD to be established practices or an evidence-based practice, with the exception of direct instruction, which was not specifically listed by either NSP or NPDC on ASD.

Although the highest number of respondents reported using these five approaches for the target student, the number of hours per week that the practices were reportedly used varied across practices. The greatest number of respondents reported using applied behavior analysis, direct instruction and social stories between 1 and 5 hours per week. In contrast, the greatest number of respondents reported using visual supports and structured teaching 20 or more hours per week for the target student.

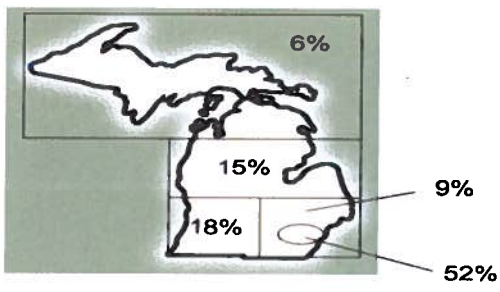
Practice	NSP	NPDC on ASD	Number (Percent) Reported Use	Time/Week Number (Percent)
Visual Supports	Not listed	EBP	134 (69%)	<1: 16 (12%) 1-5: 30 (22%) 6-10: 22 (16%) 11-20: 13 (10%) >20: 52 (39%)
Structured Teaching	Emerging	EBP (structured work stations)	132 (68%)	<1: 19 (14%) 1-5: 28 (21%) 6-10: 16 (12%) 11-20: 18 (14%) >20: 51 (39%)
Direct Instruction	Not listed	Not listed	119 (61%)	<1: 8 (7%) 1-5: 47 (39%) 6-10: 26 (22%) 11-20: 20 (17%) >20: 18 (15%)
Applied Behavior Analysis	Established (antecedent or behavioral package)	EBP	114 (59%)	<1: 21 (18%) 1-5: 37 (32%) 6-10: 16 (14%) 11-20: 12 (11%) >20: 28 (25%)
Social Stories	Established (story based intervention package)	EBP (social narrative)	109 (56%)	<1: 44 (40%) 1-5: 52 (48%) 6-10: 9 (8%) 11-20: 3 (3%) >20: 1 (.9%)

Distribution of Respondents' Use of Approach in Hours per Week for Target Student (*only including those who reported using the approach*)

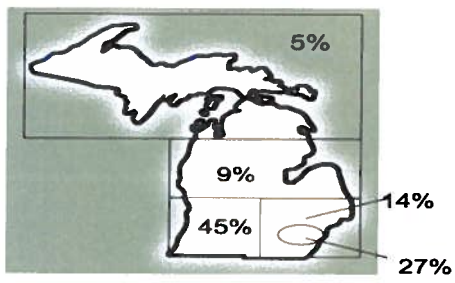


Observational Data.

Twenty-two classroom observations occurred across the state of Michigan. Observations took place in special education classrooms (17), general education classroom (1), general education and special education classrooms (3), and a general education classroom and resource room (1). The regional breakdown in comparison to our planned sample is provided in the figure below. Note that we unfortunately had an overrepresentation of data from the southwest part of the state. Data were taken at the student level when possible and at the classroom level at every observation. All observations occurred for approximately half of the school day and during academic or functional skill building periods. Observations were not designed to align directly with the survey questions or validate participants' responses, however there was some overlap between categories of interest. Please note that all data associated with the observations should be interpreted with extreme caution, given the low number of observations.



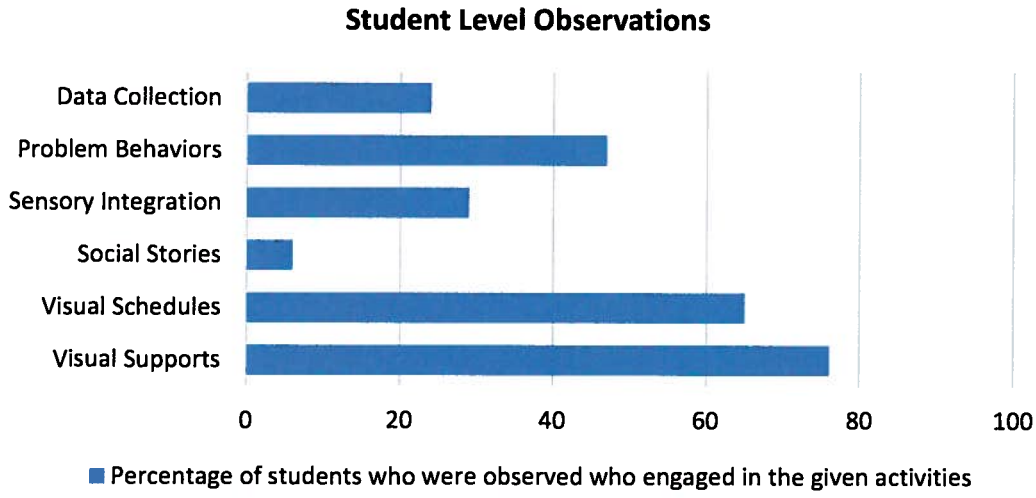
Planned Sample



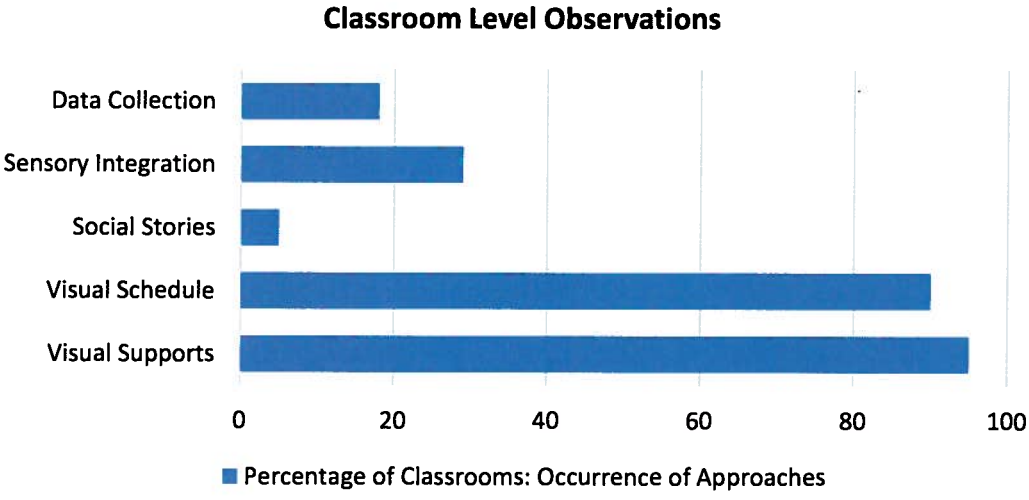
Obtained Sample

Student Level. As discussed previously, the five most highly reported practices by teachers were visual supports (69%), structured teaching (68%), direct instruction (61%), applied behavior analysis (59%), and social stories (56%). We were able to obtain student level data for 18 students with ASD. Observations at the student level indicated that 76% and 65% of the students had access to visual supports and visual schedules, respectively. During some point of the observation, 6% of students were engaged in social stories and 29% were engaged in sensory stimulation. Forty-seven percent engaged in problem

behavior, which was broadly defined as any instance of aggression toward others, self-injurious behavior, property destruction, refusal to complete a task, running away, or falling on the floor and refusing to move. A required component related to the implementation of applied behavior analysis practices is data collection, this occurred at some point during the observation for 24% of the students.



Classroom Level. We were able to conduct 22 observations of classrooms across the state of Michigan. Observations at the classroom level indicated that 95% and 90% of the students had access to visual supports and visual schedules, respectively. During some point of the observation, 5% of students were engaged in social stories and 29% were engaged in sensory stimulation. A required component of the implementation of applied behavior analysis practices is data collection and this occurred at some point during the observation in 14% of the classrooms.



Research Question 3

What are the parent perspectives on the nature of educational services provided to students with ASD in Michigan?

Demographic information on parents in respondent sample.

Information about students who have ASD in public schools is confidential; therefore we could not directly contact parents and request survey participation. The combined recruitment strategies of (1) asking special education respondents to forward information about the study to the selected student's parent(s) and (2) advertisements through various parent advocacy groups and school district newsletters, resulted in 34 parent respondents. The biological mother, stepmother, and biological father accounted for 94%, 3%, and 3% of the respondents, respectively.

Respondents' Affiliation to Child	**Percent**
Biological Mother	94
Stepmother	3
Biological Father	3
Respondents' Gender	**Percent**
Male	3
Female	97
Respondents' Race/Ethnicity	**Percent**
White: Non-Hispanic	94
African American	3
Asian/Pacific Islander	3
Respondents' Education	**Percent**
Graduated High School	3
Associate's Degree	6
Bachelor's Degree	50
Master's Degree	26
Doctorate Degree	3

Background information on children.

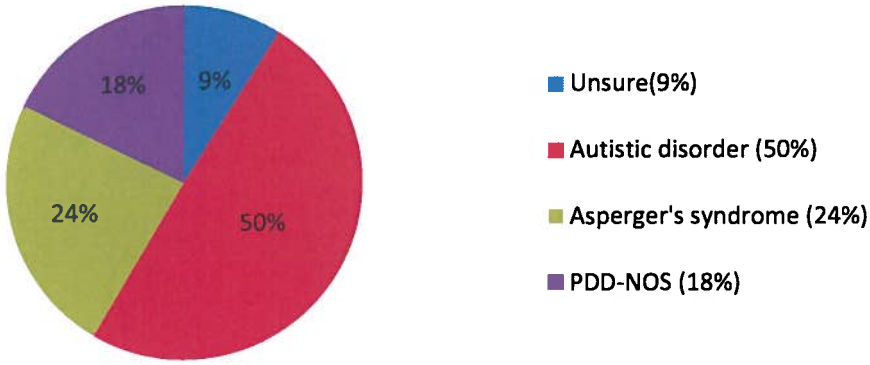
Survey respondents provided information about their children. Eighty-five percent of the children where male and 15% were female. The majority of children were White, non-Hispanic (88%) and ranged in age from 4 to 18 years old.

Childs' Gender	**Percent**
Male	85
Female	15
Childs' Race/Ethnicity	**Percent**
White: Non-Hispanic	88
African American	3
Asian/Pacific Islander	3

All of the children had a diagnosis on the autism spectrum, however 9% of the respondents indicated they were unsure of the exact diagnosis. Fifty percent, 24%, and 18%, indicated a diagnosis of autistic

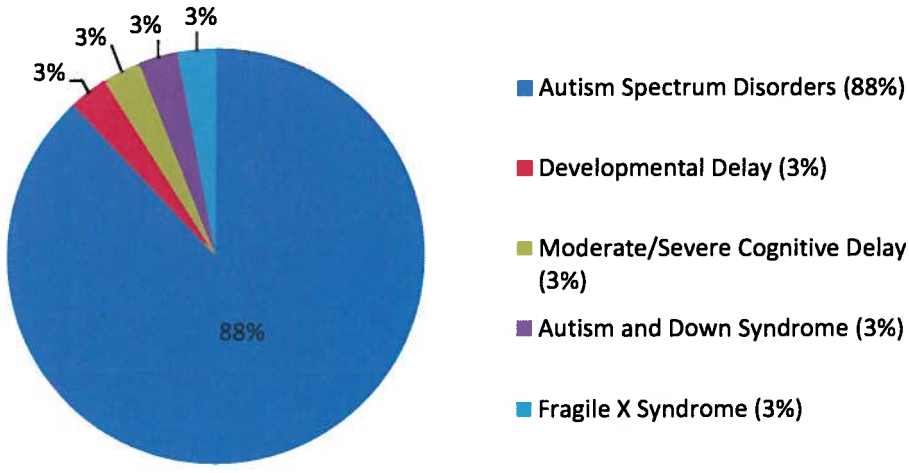
disorder, Asperger's syndrome, and pervasive developmental disorder – not otherwise specified, respectively.

Diagnosis on the Autism Spectrum



Although all of the children had a diagnosis on the autism spectrum, it was not the primary disability for 12% of the children. The child's primary disability is indicated in the figure below.

Child's Primary Disability



Research Question 3

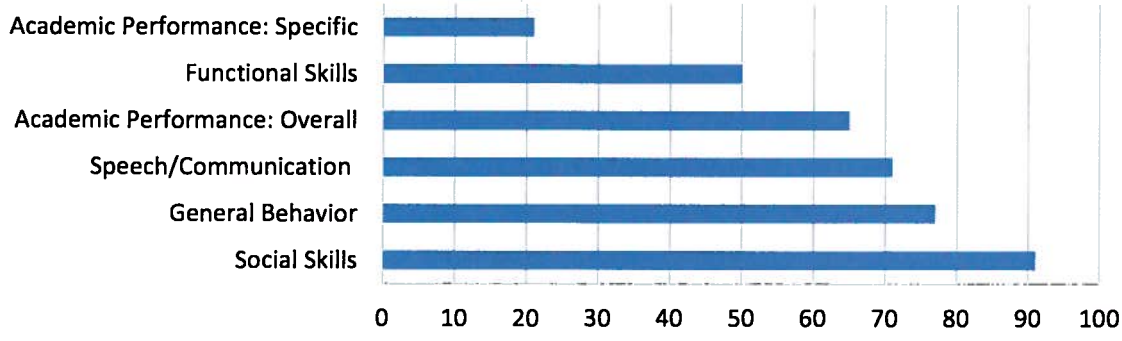
What are the parent perspectives on the nature of educational services provided to students with ASD in Michigan?

To what extent are they satisfied or dissatisfied with the current services being provided?

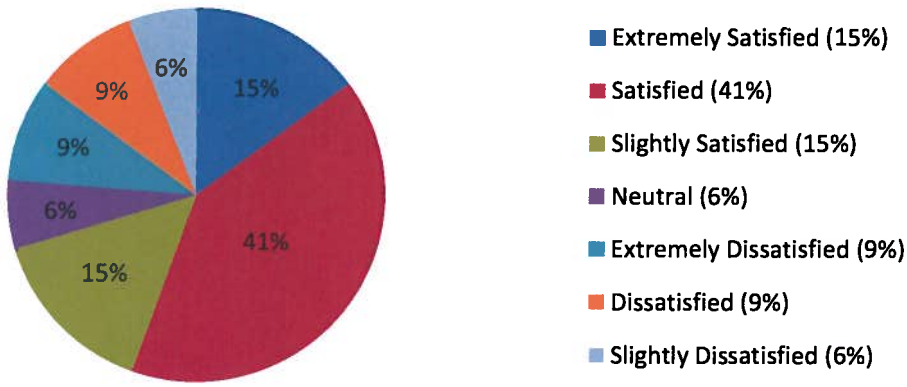
Respondents were asked to report on the type of goals that the child was working toward in school (bar graph below) and to what extent they were satisfied or dissatisfied with these goals (pie graph below).

Overall, the respondents indicated some level of satisfaction with the goals. Specifically, 15%, 41%, and 15% were slightly satisfied, satisfied, and extremely satisfied, respectively.

Percentage of Students Working Toward School Goals

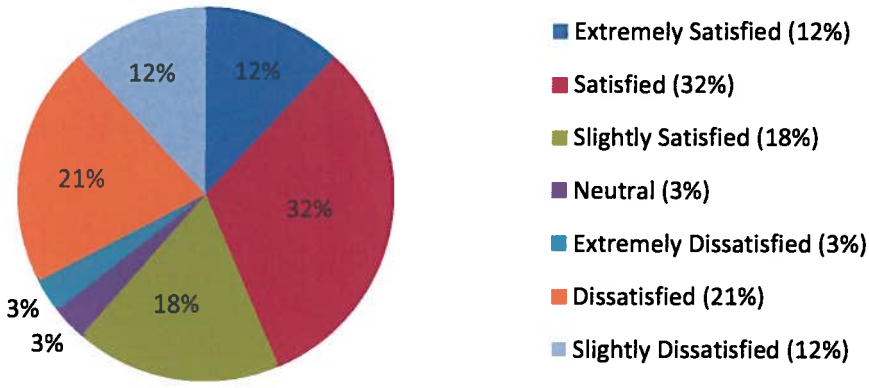


Parent Level of Satisfaction with Goals



Parents were also asked to report their level of satisfaction with their child's progress toward the goals at school. The majority of parents indicated some level of satisfaction (62%) with their child's progress. However, approximately 36% of parents were dissatisfied to some degree.

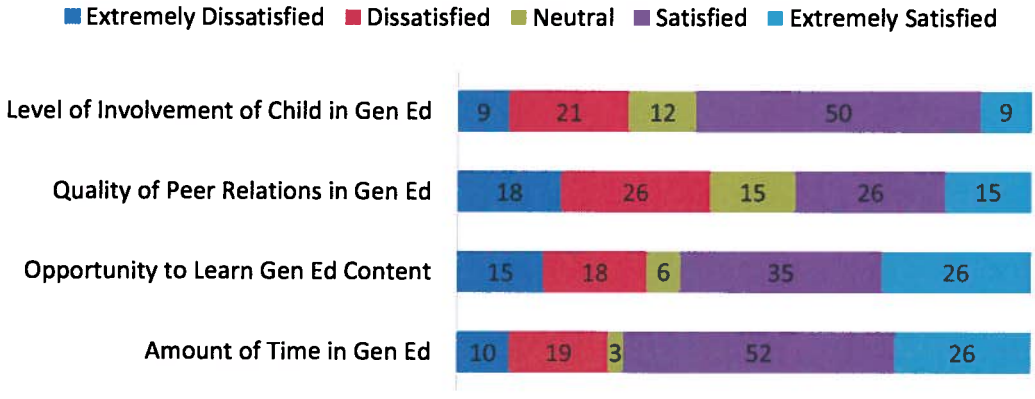
Parent Level of Satisfaction witih Progress Toward Goals



Parents were asked to report their level of satisfaction or dissatisfaction with specific services provided to their child by the school system (see Appendix D). Overwhelmingly, parents who indicated the service was applicable reported some level of satisfaction with each type of service, such as speech services (83%), paraprofessional support (82%), physical therapy (83%), and social work support (81%). In fact, there was only one service that fell below at least 50% satisfaction and that was extracurricular activities (48%).

Respondents were also asked to report their level of satisfaction or dissatisfaction about specific components of the general education setting. The majority of parents indicated some level of satisfaction with the amount of time the child spends in the general education classroom (77%), the opportunity to access general education content (62%), and the level of involvement of the child in the classroom (59%). The only area in which the majority of parents indicated some level of dissatisfaction (44%) was with the quality of peer relations.

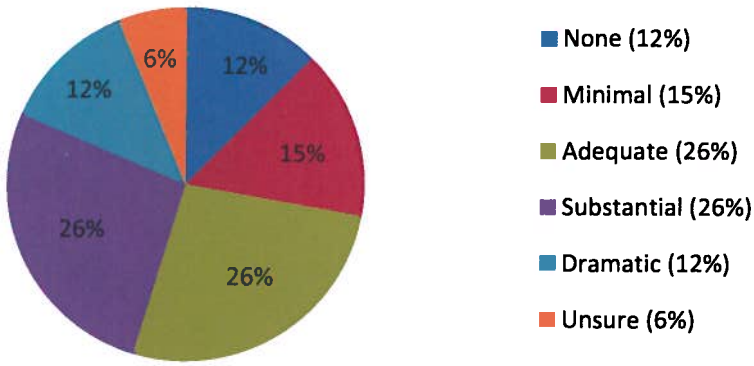
Percentage of Respondents: Satisfaction/Dissatisfaction with Components of General Education



To what extent have they advocated for better services for their child?

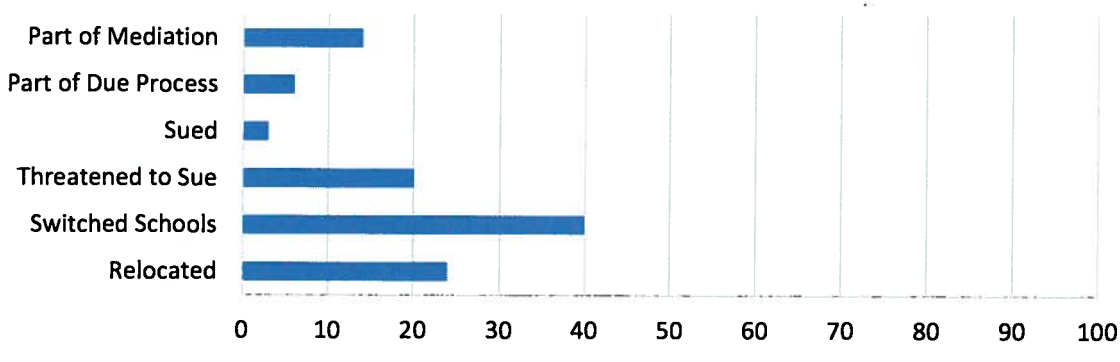
Seventy-six percent of respondents reported requesting additional school services for their child other than what the child's school initially offered to provide. The majority of respondents indicated that their advocacy efforts improved the school services provided to the child to some degree. More specifically, respondents indicated that there was minimal (15%), adequate (26%), substantial (26%), and dramatic (12%) improvement.

Improvement of School Services After Advocacy Efforts

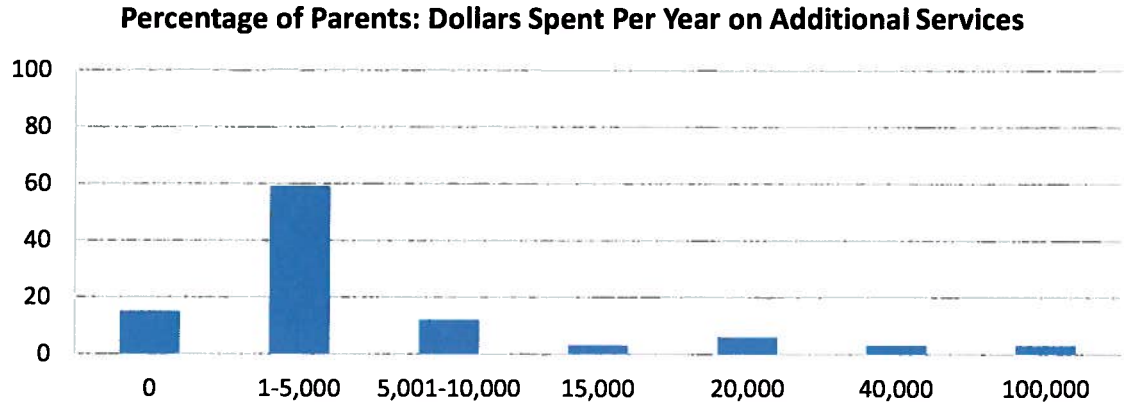


Parents reported making significant efforts in order to attempt to access the best services for their child. Forty percent of the respondents switched schools, 24% relocated, 20% threatened to sue the school, 3% actually sued the school, 6% were part of due process and 14% were part of a mediation process.

Percentage of Parents: Actions to Access Services for Child with ASD



Eighty-five percent of the respondents have sought additional services outside the public school setting for their child. Respondents have spent between $0-$100,000, with a mean of $8,116 per child per year to obtain outside services for their child.



Research Question 4

Does the nature of instruction provided to students with ASD in Michigan vary according to various characteristics across the state?

We conducted follow-up analyses for many of the questions addressed in Research Question 1 to determine if there was variation according to socioeconomic level or geographic region. These comparison analyses were conducted based on the characteristics of the county in which the district was located. We recognize that this level of analysis may unfortunately hide variation at the district and school level in terms of socioeconomic status; however, it was the unit at which we had clear median household income information available that could match with our dataset. Medium socioeconomic status was represented by districts in counties where the median household income was within $5,000 of the statewide median household income of $48,000. Low socioeconomic status was considered that to be below $43,000, and high socioeconomic status was considered that to be above $53,000. The five geographic regions that were analyzed were as follows: Southwest (SW), Southeast (not including the Tri-County area of Wayne, Macomb, and Oakland Counties; SE/noT), Tri-County Area (Tri), Thumb and Mid-Michigan (Thumb/Mid), and Northern Michigan and the Upper Peninsula (UP/N).

Basic demographic Information for the targeted students (the same sample used for Research Question 1 above) by socioeconomic status category and geographic region is provided in Appendix E. Gender make-up was similar across categories, with a slightly higher proportion of females represented in the southwest and middle socioeconomic groups. The proportion of non-white students who were reported on was similar across groups with the exception that it was lower in the high socioeconomic group, as well as in the SE/noT and UP/N geographic regions. Students with a diagnosis of autistic disorder represented the majority of targeted students across all categories, varying between 68% (SE/noT) and 87% (UP/N) across these categories.

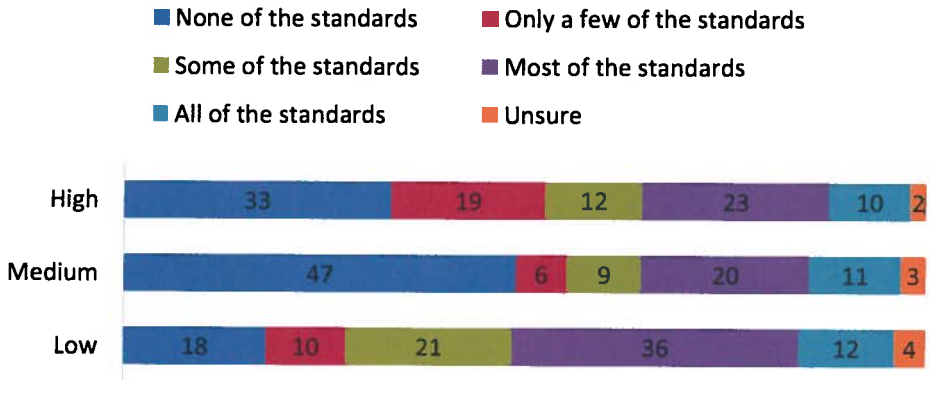
For the purpose of highlighting differences by categories, we considered a difference significant if it represented a difference of 10% or more between socioeconomic category or a difference of 20% or more between geographic regions. (Geographic region groups were smaller, and therefore more random fluctuation was expected). *It is important to note that the UP/N category was very small (N =8),*

and so comparisons between this group and other groups are not discussed; however, data for this category are displayed.

What are the instructional targets and expectations for students with ASD receiving special education?

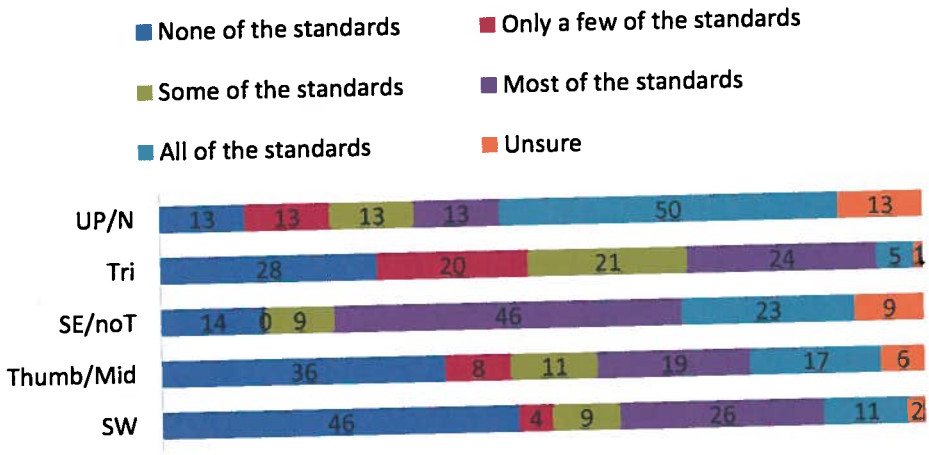
Across socioeconomic categories, between 10% and 12% of respondents reported expecting their target student to meet all of the grade level achievement standards. However, nearly half of the respondents in the middle socioeconomic category expected their target students to meet none of the grade level achievement standards, whereas only 18% of the low group and 33% of the high group had these low expectations. Looking back at demographic differences, the middle group tended to have a lower proportion of students with the more severe diagnosis of autistic disorder than the other groups, and so this difference does not seem to account for the lower expectations in this category. Also, many more respondents in the low socioeconomic group (36%) expected their target students to meet most of the grade-level standards than the middle (20%) and high group (23%).

Percentage of Respondents: Expecations for Target Student to Meet Grade Level Expectations by Socioeconomic Category



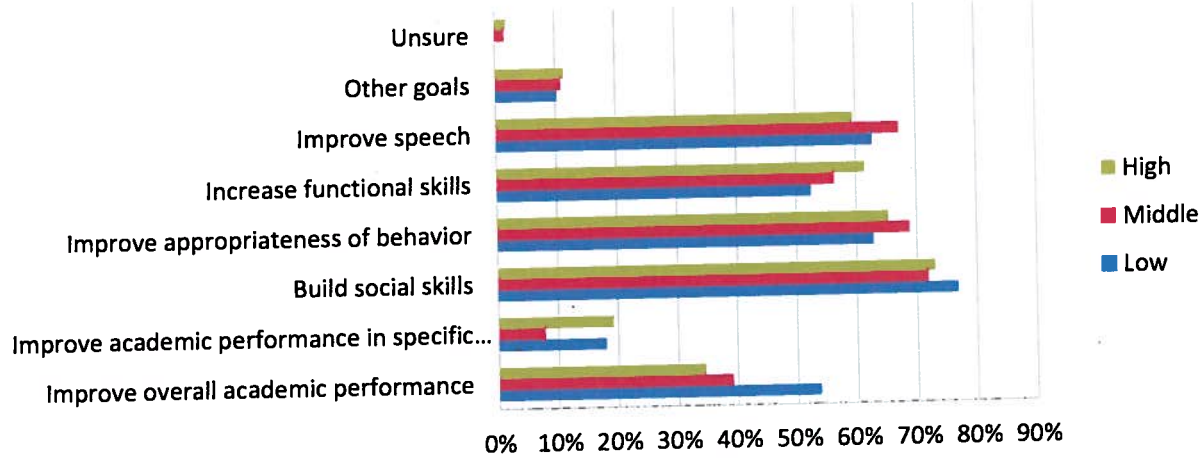
Some differences are also noted by geographic region. In general, the SW region tended to have highest proportion of respondents expecting none of their target students to meet grade level standards (46%). Many within the SE/noT expected students to meet most or all of the grade level standards (46% and 23%, respectively).

Percentage of Respondents: Expecations for Student to Meet Grade Level Expectations by Geographic Region

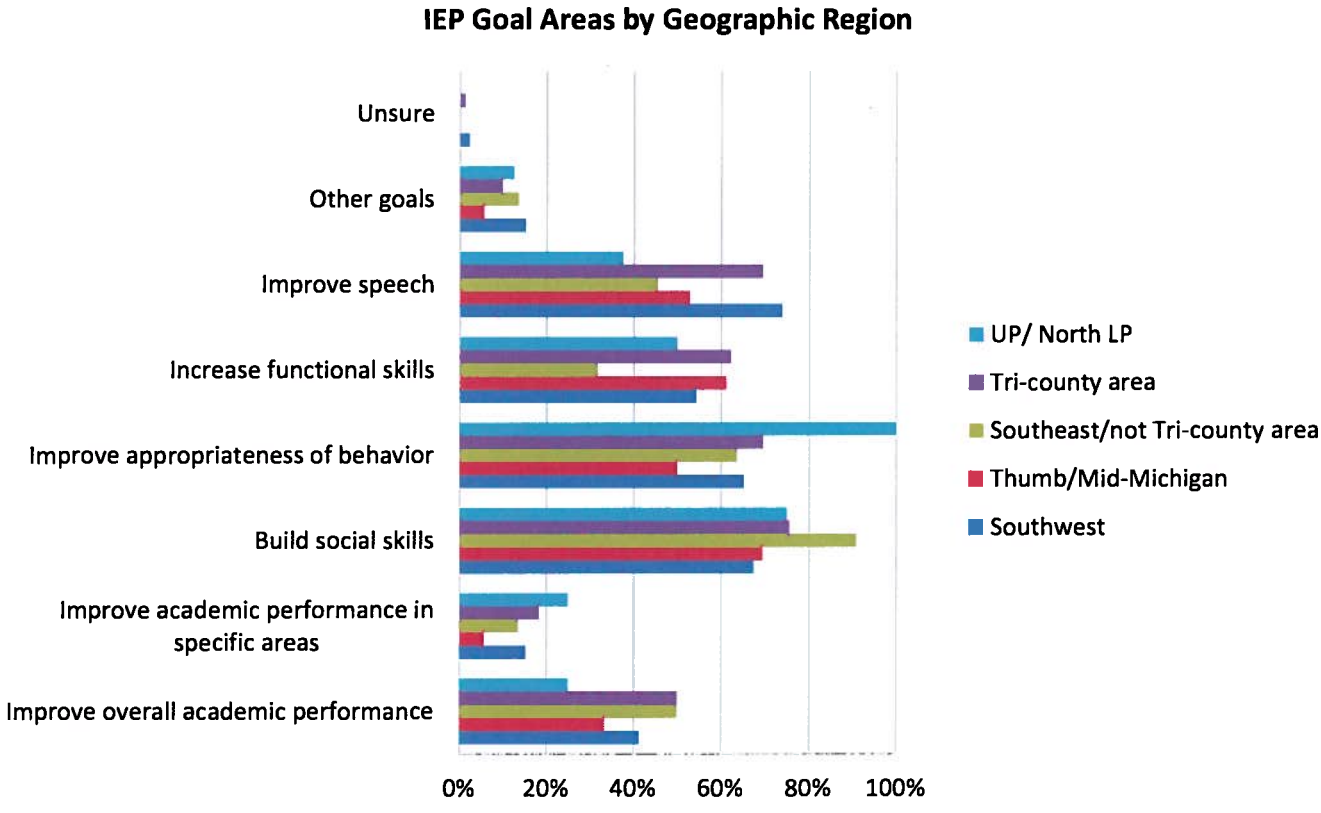


The following represents reported IEP goal areas by socioeconomic category. The only strong difference is in the larger relative proportion of respondents in the low socioeconomic category indicating goals in the area of improving overall academic performance.

IEP Goal Areas by Socioeconomic Category



More variation was noted in types of goal areas across region; however, this may be due to the smaller number of respondents representing each category. Results are provided below by region. Many respondents from the Southeast/non tri-county area reported social skills as a target area, and many from the Tri-county and Southwest areas reported speech to be a target area. Functional skills tended to not be a focus for the target students who were reported about in the Southeast/non tri-county area.



What is their level of inclusion in the general education classroom?

The proportion of respondents reporting that target students were included in the general education classroom for at least one subject was not substantially different across socioeconomic or regional categories. These proportions are provided below.

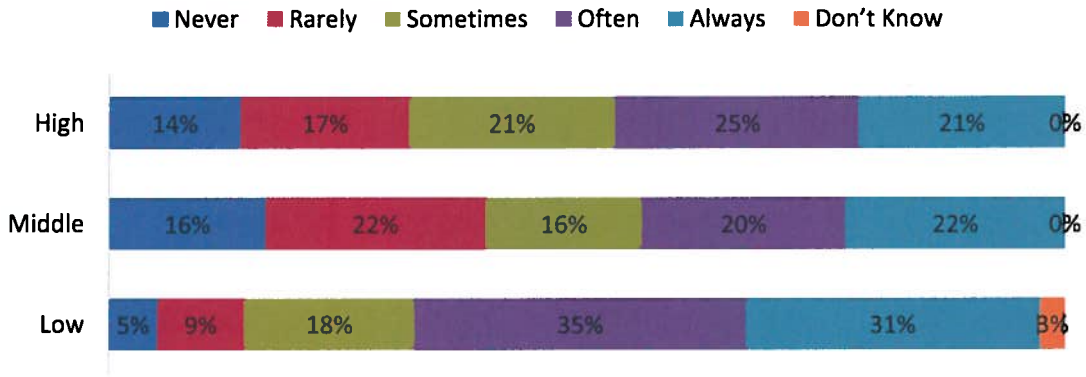
Table. ***Percentage of respondents reporting target student receives at least one class in the general education classroom***

Socioeconomic Category	Percent
Low	68
Medium	64
High	69
Geographic Region	**Percent**
Southwest	70
Thumb/Mid	58
Southeast/Non Tri-county	77
Tri-County Area	65
UP/North LP	88

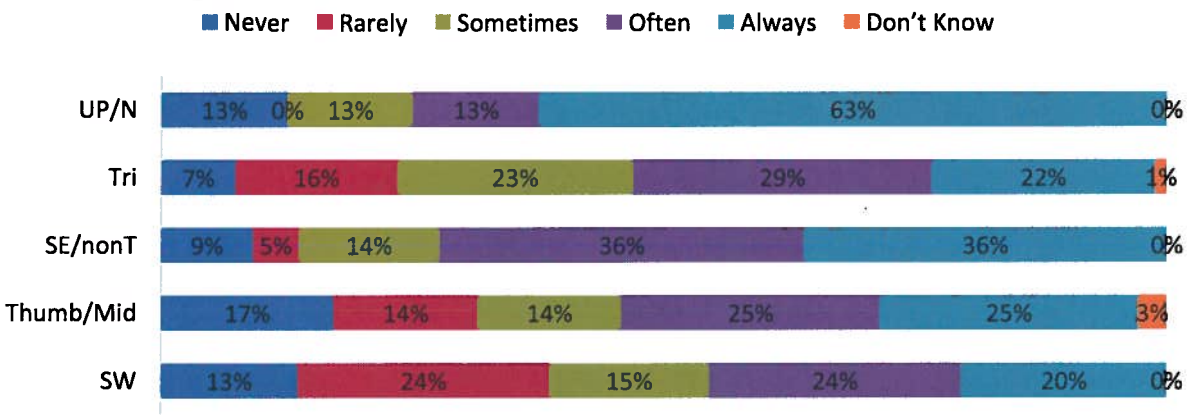
What is their exposure to the general curriculum?

The figures below show the extent to which respondents reported that target students worked with materials from the general curriculum by socioeconomic level and region. Those in the low socioeconomic category tended to report students often had access to these materials. No substantial differences were noted by regional category.

Percentage of Respondents: Reported Access to General Curriculum and Related Materials by Socioeconomic Category



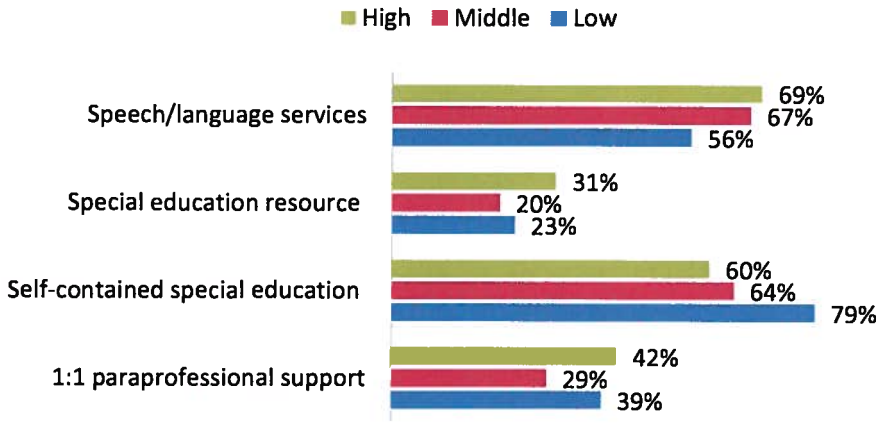
Percentage of Respondents: Reported Access to General Curriculum and Related Materials by Geographic Region



What are specific programs and strategies used?

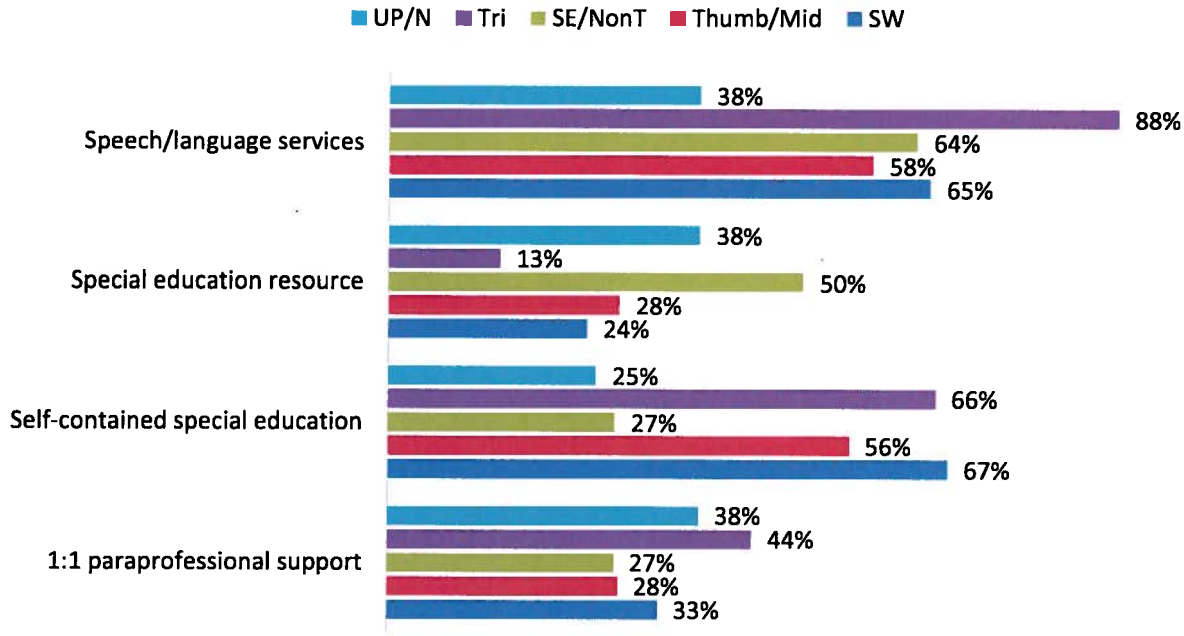
Special support services that were reported to be provided to target students are reported by socioeconomic and regional categories below.

Percentage of Target Students Receiving Special Services by Socioeconomic Category



A greater proportion of respondents in the low socioeconomic category reported that target students received self-contained special education services. A smaller proportion of respondents from the middle category reported target students receiving 1:1 paraprofessional support. Speech/language services were less commonly reported among respondents in the low category.

Percentage of Target Students Receiving Special Services by Geographic Region



A large proportion of the respondents from the Tri-County area reported that the target students received speech services. Much greater proportions of target students from the Southwest, Tri-County,

and Thumb/Mid-Michigan regions were reported to receive self-contained special education services than those from the Southeast/Non Tri-County area and the Upper Peninsula/Northern Michigan. A greater proportion from the Tri-County area was reported to receive 1:1 paraprofessional support.

In terms of specific approaches that were commonly reported, we identified and compared the programs for which more than 50% of the respondents in a category reported using the given program with the target students. Several programs were common across socioeconomic categories. These included: applied behavior analysis, direct instruction, structured teaching, and visual supports and strategies. Four additional interventions met the "50% respondents reporting use" criterion for the low socioeconomic category and included the following: TEACCH, gentle teaching, class-wide peer tutoring, and PECS. Six additional interventions met the criterion for the high socioeconomic category including the following: social decision-making, peer buddies, peer social groups, computer assisted instruction, multi-sensory environments, and sensory integration training. For the regional categories, applied behavior analysis, direct instruction, and structured teaching met the aforementioned criterion across all categories except for the upper peninsula/northern Michigan group. One approach met this criterion uniquely for the southwest region, namely TEACCH. Several met this criterion uniquely for the Tri-county area, namely social decision-making, gentle teaching, peer buddies, peer social groups, and sensory integration training.

Research Question 5

What training for working with special populations is provided to those who provide educational services and support to students with ASD in Michigan?

A total of 131 general educators and paraprofessionals were contacted to complete the survey given that the special education professionals provided their contact information. Of those, a total of 17 general educators and 36 paraprofessionals reported on the training they received. This represents 40% of those whose contact information was provided. As indicated earlier, the sample used to address Research Questions 1, 2, and 4 included the school professional deemed most knowledgeable about the target student's education (typically the special educator), which was derived from the special education personnel database in which we had a response rate of approximately 26%. We used the special educators from that sample to address questions about the training special educators receive.

The five most highly reported practices and training associated with those practices.

As previously indicated in the Research Question 2 section, the five most highly reported practices of respondents who were part of the sample analyzed for Research Questions 1, 2, and 4 were visual supports (69%), structured teaching (68%), direct instruction (61%), applied behavior analysis (59%), and social stories (56%). For these five most used practices, all respondents also indicated how training (if any), was obtained. Responses varied across special educators, general educators and paraprofessionals. Overall, (a) the largest number of special educators received training on all five approaches through graduate school (applied behavior analysis 36%, structured teaching 42%, social stories 37%, and visual supports 43%), with the exception of direct instruction in which training occurred in undergraduate

school (41%), (b) the largest number of general educators received training on structured teaching in graduate (35%) and direct instruction in undergraduate school (35%), and did not receive any training in applied behavior analysis (53%), social stories (65%), or visual supports (59%), and (c) the largest number of paraprofessionals received training in applied behavior analysis and visual supports through "peer or self" training (42% and 50%, respectively), and did not receive any training in direct instruction (36%), structured teaching (47%) or social stories (42%).

Top Five Reported Approaches and Respective Training Across Special Educators, General Educators and Paraprofessionals									
Practice	**Training Special Educators Number and (Percentage) [N = 164]**			**Training General Educators Number and (Percentage) [N = 17]**			**Training Paraprofessionals Number and (Percentage) [N = 36]**		
Applied Behavior Analysis	Undergrad:	53	(32%)	Undergrad:	2	(12%)	Undergrad:	1	(3%)
	Graduate:	59	(36%)	Graduate:	4	(24%)	Graduate:	0	(0%)
	C/U:	12	(7%)	C/U:	0	(0%)	C/U:	1	(3%)
	Prof Dev:	36	(22%)	Prof Dev:	5	(30%)	Prof Dev:	9	(25%)
	Ex WS:	27	(16%)	Ex WS:	2	(12%)	Ex WS:	4	(11%)
	Peer/Self:	27	(16%)	Peer/Self:	0	(0%)	Peer/Self:	15	(42%)
	Other:	1	(.6%)	Other:	0	(0%)	Other:	0	(0%)
	None:	25	(15%)	None:	9	(53%)	None:	11	(31%)
Direct Instruction	Undergrad:	68	(41%)	Undergrad:	6	(35%)	Undergrad:	3	(8%)
	Graduate:	59	(36%)	Graduate:	5	(30%)	Graduate:	2	(6%)
	C/U:	15	(9%)	C/U:	1	(6%)	C/U:	0	(0%)
	Prof Dev:	35	(21%)	Prof Dev:	2	(12%)	Prof Dev:	6	(17%)
	Ex WS:	18	(11%)	Ex WS:	0	(0%)	Ex WS:	2	(6%)
	Peer/Self:	23	(14%)	Peer/Self:	1	(6%)	Peer/Self:	9	(25%)
	Other:	1	(.6%)	Other:	1	(6%)	Other:	0	(0%)
	None:	24	(15%)	None:	3	(18%)	None:	13	(36%)
Structured Teaching	Undergrad:	46	(28%)	Undergrad:	5	(30%)	Undergrad:	1	(3%)
	Graduate:	69	(42%)	Graduate:	6	(35%)	Graduate:	2	(6%)
	C/U:	16	(10%)	C/U:	0	(0%)	C/U:	0	(0%)
	Prof Dev:	39	(24%)	Prof Dev:	1	(6%)	Prof Dev:	6	(17%)
	Ex WS:	20	(12%)	Ex WS:	0	(0%)	Ex WS:	3	(8%)
	Peer/Self:	35	(21%)	Peer/Self:	2	(12%)	Peer/Self:	11	(31%)
	Other:	4	(2%)	Other:	0	(0%)	Other:	1	(3%)
	None:	28	(17%)	None:	5	(30%)	None:	17	(47%)
Social Stories	Undergrad:	25	(15%)	Undergrad:	0	(0%)	Undergrad:	2	(6%)
	Graduate:	60	(37%)	Graduate:	2	(12%)	Graduate:	0	(0%)
	C/U:	14	(9%)	C/U:	0	(0%)	C/U:	0	(0%)
	Prof Dev:	37	(23%)	Prof Dev:	3	(18%)	Prof Dev:	5	(14%)
	Ex WS:	42	(26%)	Ex WS:	0	(0%)	Ex WS:	3	(8%)
	Peer/Self:	43	(26%)	Peer/Self:	1	(6%)	Peer/Self:	12	(33%)
	Other:	4	(2%)	Other:	0	(0%)	Other:	0	(0%)
	None:	28	(17%)	None:	11	(65%)	None:	15	(42%)

Visual Supports	Undergrad:	39	(24%)	Undergrad:	1	(6%)	Undergrad:	2	(6%)
	Graduate:	70	(43%)	Graduate:	2	(12%)	Graduate:	0	(0%)
	C/U:	17	(10%)	C/U:	0	(0%)	C/U:	1	(3%)
	Prof Dev:	59	(36%)	Prof Dev:	4	(24%)	Prof Dev:	10	(28%)
	Ex WS:	62	(38%)	Ex WS:	1	(6%)	Ex WS:	8	(22%)
	Peer/Self:	47	(29%)	Peer/Self:	1	(6%)	Peer/Self:	18	(50%)
	Other:	3	(2%)	Other:	0	(0%)	Other:	0	(0%)
	None:	26	(16%)	None:	10	(59%)	None:	11	(31%)

The five most highly reported practices and training associated with those practices. Undergraduate (Undergrad), College/University Coursework (C/U), Professional Development (Prof Dev), External Workshop (Ex WS), Peer or Self-Taught (Peer/Self), and No Training Received (None).

Survey of Special Education Programs at Institutes of Higher Education (IHEs) in Michigan.

Eight of the fourteen IHEs that were part of our sample responded to the survey, including six state universities and two smaller colleges. Across all special education program director's who responded, they reported a total of 9 faculty (out of 64 faculty total) with special expertise in ASD. Two directors reported currently having programs leading to an endorsement in ASD, both of which required graduate level training. These two programs reported the following theories to provide the foundation for their training programs: Behavioral, Sociocultural, Social Learning Theory, Ecological Systems Theory, Ecobehavioral Theory, and Eclectic. One of the two reported a particular focus on Positive Behavioral Supports. The two endorsement programs are 18/19 credit hour programs with 180 hours of direct supervised experience working with children with ASD. The most common theoretical perspective across all responding special education programs (including those that do not offer training toward an endorsement in ASD) was constructivism and social learning theory.

Additional Information on Teachers with ASD Endorsement in Michigan Public Schools.

Based on the Center for Educational Performance and Information (CEPI) data from the 2008-09 school year from which we sampled for the study, 672 individuals were reported to have a teaching assignment code of "Autistically-impaired", and 88 individuals were reported to have an assignment code of "Teacher Consultant – Autistic Impaired."

Between September of 2006 and August of 2009, 292 individuals enrolled in Michigan teacher preparation programs were reported to have passed the Michigan Test for Teacher Certification test with a focus on students with ASD (Michigan Department of Education, 2010). However, according to the end of year data for 2010 from the Michigan Online Educator Certification System supplied by the Michigan Department of Education, only 59 new teachers (i.e., within the first three years of teaching) with the endorsement in ASD were reported as being employed in public school districts in Michigan. In this dataset, 852 total individuals were reported as having the ASD endorsement and being employed in Michigan.

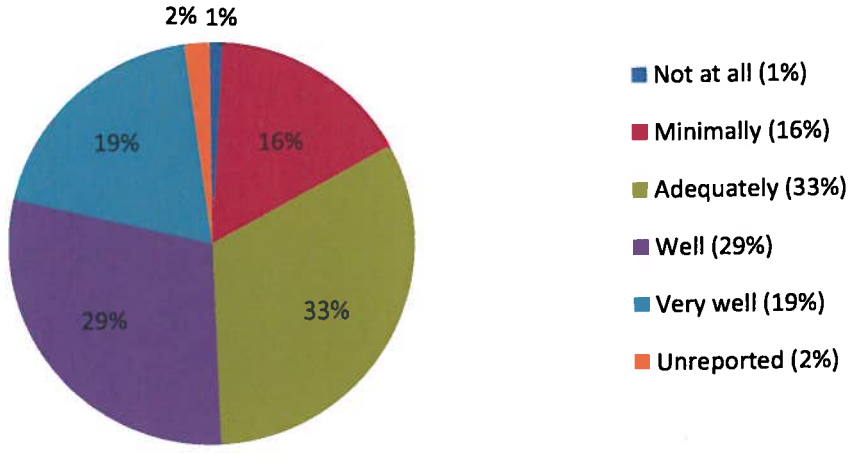
There are a variety of potential reasons for the apparent lack of individuals who are being trained for addressing the needs of individuals with ASD being placed in Michigan public schools, and further

investigation is warranted to determine why those who are being trained do not appear to be seeking out employment in Michigan.

Perceptions of Respondent Sample.

Using the responding sample that was analyzed to address Research Questions 1, 2, and 4 we examined respondents' answer to the question: "To what extent do you think your training and professional development have equipped you to work with this student?" Responses were as follows:

Percentage of Respondents: Extent to Which Respondents Feel Equipped to Teach Target Student



Discussion

The number of children diagnosed with ASD is on the rise (Chakrabarti & Fombonne 2005; Kogan et al., 2009; Yeargin-Allsopp et al. 2003). Students with ASD experience substantial challenges in the area of communication, behavior, and social skills (APA, 2000). These defining characteristics can greatly impact their success in school environments; many students with ASD are also diagnosed as having a learning disability (Mayes and Calhoun, 2006). According to the Individuals with Disabilities Education Act (IDEA), public schools are required to provide a free and appropriate education to all students in the least restrictive environment. Through this legislation and associated support services, it is anticipated that many students, including those with ASD, can gain the skills necessary to make important contributions to society. As accountability is on the increase, school systems are under stricter requirements to report on the academic progress of all students according to the general curriculum, including those with disabilities (No Child Left Behind Act of 2001). However, new accountability requirements alone are not likely to improve educational services; effective school programming is expected to be necessary.. Research is accumulating on strategies and programs that are effective and that show promise for helping to address the unique difficulties of students with ASD (National Autism Center, 2009). At the present time, little is known about the status of education in Michigan for students with ASD. In order to learn more about the current status of services provided to students with ASD in Michigan, we intended to survey school professionals and parents about a sample of kindergarten-12th grade students with ASD receiving public school services from across the state.

Difficulties in accessing relevant information. Given increasing reporting and large-scale assessment requirements associated with the standards-based reform movement (e.g., Michigan Education Assessment Program), as well as the increasing technologies available to collect and organize related data in an efficient manner, we originally anticipated that resources would exist from which we could (in collaboration with the state department of education) draw a representative sample of students with ASD for our study. However, rules surrounding the confidential nature of disability status are making it particularly difficult to develop and maintain state-level data systems that would include the information pertinent to our study. As a result, we were forced to make use of the somewhat limited statewide datasets that were available on special education personnel and distribution of students with ASD across the state to guide our sampling process. Although we developed a plan for selecting special education personnel based on our understanding of how students with ASD can be provided special education services in a variety of ways (e.g., through consultant support, resource services, self-contained programming), we had no way of knowing prior to selecting and contacting members of the planned sample who served students with ASD. We therefore had to rely on those we contacted to provide names of special educators who did serve students with ASD if they themselves did not serve such a student.

Additionally, in order for us to be able to both survey and potentially observe a student within the same academic year, many special permissions and consents were needed (e.g., school district, parent, teacher, student assent). A feasible timeline for the project therefore required that we complete sample selection early in an academic year. Unfortunately, the dataset that we could gain access to

would not be fully ready until late in the academic year, and so a the closest dataset we could use included special education professionals from the academic year prior to our academic year of investigation. This created special difficulties in that many special educators change placements and positions over the summer, and may no longer have been serving at the corresponding district listed in the dataset or may have been serving in a different role than that provided for the previous year's dataset.

Furthermore, we had to rely on the selected special education personnel to forward information about the study to general educators and paraprofessionals to participate. We unfortunately had very limited total responses among these professionals. Given the multiple responsibilities educators have, it may be the case that completing a survey, even if it is brief, goes beyond what they can feasibly accomplish.

Parent data collection efforts. We intended to obtain information that represented services provided across the state, and our only statewide dataset was based on school professionals. Therefore, we had to rely on school professionals to forward information to parents about the opportunity to participate. However, given that disability status is confidential, and teachers are not allowed to provide the names of students who they serve, we were not able to effectively track whether school professionals did contact parents as requested. We unfortunately received very limited responses from parents, which may be due to a failure of school professionals to provide parents with information about the study, or may be simply due to parents' lack of time or willingness to participate. Given the data we were able to collect, we do not have a compelling reason for the lack of parent response. Following our additional parent recruitment efforts (i.e., posting information about how to participate in school newsletters, through parent advocacy group newsletters), we did receive some further responses. However, we were overall disappointed with the results of these efforts.

We hope that the challenges we experienced can be used to inform the development of more accessible databases such that researchers and school professionals can more effectively and efficiently collaborate in collecting data that may help better address the needs of students in schools in the future. It is understandable that balancing confidentiality requirements and access to information presents a challenge. However, we think it is important to identify ways to overcome this challenge through the development of databases that are both secure and that can be efficiently updated. We anticipate such efforts may go a long way in terms of allowing for better informed targeting of resources and monitoring of intervention efforts. Furthermore, effectively communicating to educators the potential helpfulness of providing such information may be essential to improving response rates.

Expectations held for students with ASD. Although one can make an educated guess based on prior student progress, it is ultimately impossible to predict exactly what a student will be able to learn and do. High expectations have been described as an important aspect of effective teaching (Brophy & Good, 1986) and effective schools (Phillips, 1997). Unfortunately, low expectations can be associated with a more passive approach to teaching (Mortimore, 1993). In our study, we found approximately one-third of respondents (32%) to report an expectation that their target student with ASD would meet *none* of the grade level achievement standards. We consider this to reflect somewhat low expectations for this group of students given that many students with cognitive impairments can reach at least some

grade-level expectations (McGrew & Evans, 2004). Interestingly, more students from school districts in the low socioeconomic category had teachers who reported high expectations for grade-level achievement. **Overall, our data seem to suggest that higher expectations among teachers are needed.** It may be helpful to provide educators with examples of students with ASD who have succeeded in meeting high expectations when given adequate supports in order to improve their expectations and potentially encourage their active use of effective teaching approaches.

Exposure and access to the general curriculum. In line with the results indicating nearly one-third of respondents didn't expect target students to meet any grade-level achievement standards, just under one-third (26%) of the targeted students were reported to never or rarely have access to the general curriculum. According to IDEA, all students are expected to have access to the same content standards and general curriculum made available to students without disabilities. This discrepancy in legal expectations and the related experiences of students appears problematic. It may be the case that different understandings of terminology among teachers are contributing to these discrepancies (e.g., teachers may view the specialized programming provided to students as a "special curriculum" when it really does address grade-level content standards). However, further investigation seems warranted to better understand whether students are able to access the general curriculum and grade-level content standards.

Although some students were reported to have access to the general education classroom in academic areas, special classes (e.g., music, art, physical education) were where the greatest proportion of students were included in the general education classroom. However, even for the class for which the greatest proportion of targeted students were reported to participate in the general education classroom (i.e., physical education), only 54% were reported to participate in the general education classroom. Interestingly, those in school districts labeled "low" in terms of socioeconomic category were more commonly reported to have access to general education materials (66% reported often or always having access for low category; 42-46% reported to often or always have access for middle and high category). It may be the case that those in higher income counties request more specialized pull-out services and programming, despite the fact that this reduces student's access to the general curriculum.

Overall, it appears that efforts should be made to ensure that students with ASD have greater access to the general curriculum. This does not necessarily mean they need greater access to the general education classroom; IDEA does not mandate that students experience the general curriculum in the general education classroom. However, it does indicate that students should have access to the general curriculum, and it appears that many students with ASD in Michigan may not be able to adequately access the general education curriculum.

Reported use of practices. School professionals reported on whether or not they used a specific practice for the target student they had in mind as they completed the survey. Respondents did not, for example, indicate whether or not they used the specific practice with other students or more broadly in the classroom. The five most highly reported practices were visual supports (69%), structured teaching (68%), direct instruction (61%), applied behavior analysis (59%), and social stories (56%). Of these five most used practices, all were reported by either NSP or NPDC on ASD to be established or evidence-

based practices, with the exception of direct instruction, which was not specifically listed by either NSP or NPDC on ASD. It is encouraging that the majority of the five most highly reported practices by school professionals are considered to be established or evidence-based, based on the NSP or NPDC on ASD reports. Equally exciting, for example, is that 59% and 56% reported using applied behavior analysis and social stories with their target student, respectively. However, of our respondents, there were 41% and 44% not engaging target students with an ASD in applied behavior analysis or social stories, respectively, both of which have been reported to be established and evidence-based practices. Interestingly, some strategies that were identified as somewhat commonly used in our sample but not adequately supported by research were most common in the school districts categorized as high in socioeconomic status.

There are two additional potential concerns related to the reported use of these five approaches that should be noted. First, we asked school professionals to report the number of hours per week that the practices were used for the individual with ASD; the greatest number of respondents reported using applied behavior analysis (32%), direct instruction (39%) and social stories (48%) between 1 and 5 hours per week. Practices that are either established or evidence-based (per NSP and NPDC on ASD) should be incorporated throughout the day, on a regular basis, to the greatest extent possible. Understandably, some students need less access to a particular practice given their individual needs and goals, however it appears that **even though respondents are reporting some use of established or evidence-based practices, there is much room for improvement both in employing the practices, and how often they are implemented.**

Second, we asked school professionals to indicate where they received training on the approaches they were using in the classroom. Overall, the largest number of special educators reported receiving training on all five approaches through graduate school (with the exception of direct instruction in which the largest number of respondents received training in their undergraduate studies). The largest number of general educators reported receiving training on structured teaching in graduate school and direct instruction in undergraduate school, and did not receive any training in applied behavior analysis, social stories, or visual supports. The largest number of paraprofessionals received training in applied behavior analysis and visual supports through "peer or self" training, and did not receive any training in direct instruction, structured teaching, or social stories. **In summary, it appears that the largest number of special educators needed to attend graduate school in order to receive training in these most used and established or evidence-based practices. The largest number of general educators received some training in these practices in undergraduate and graduate school, but for 3 of the 5 approaches, they did not receive any training at all. Finally, the largest number of paraprofessionals either did not receive any training at all, or were peer/self taught in the approaches used with individuals with ASD. Therefore, there are implications for training at every level (e.g., undergraduate, graduate, additional college/university coursework, professional development, external workshops, etc.) for each category of school professionals. Teacher preparation institutions should prepare their special educators and general educators alike, to enter the workforce armed with training in the most effective practices for individuals with ASD. Additionally, a structured and comprehensive training forum should be required for paraprofessionals to learn about the most effective practices for students with ASD.**

In post-hoc analysis of data available on the passing rates on teacher preparation tests among future teachers with an endorsement in ASD who are trained in Michigan and the numbers of new teachers employed in Michigan with the corresponding endorsement, it appears that the number being employed is much lower than those passing the tests. This data lends itself to the question of why individuals trained in Michigan may not be seeking employment in Michigan public schools. Further investigation is needed to address this question.

Parent respondents. Details about the parent recruitment process were provided in the methods section. Due to policies regarding confidentiality of disability information, we were unable to directly identify and contact parents of children with an ASD. Although we offered incentives (i.e., $15 for completing a 20 minute survey), repeatedly asked educators to contact parents for us, and subsequently advertised the study though various parent advocacy groups and school district newsletters, we received very little parent participation. We are unsure as to the exact reason(s) why we obtained minimal parent participation, but potential causes could be (a) educators were unable or unwilling (or simply did not have time) to contact parents on our behalf, (b) parents were unable (e.g., lack of time given demands of having a child on the spectrum) or unwilling (e.g., concerned about confidentiality and connection to school) to complete the survey, (c) the incentive was not large enough, or (d) we did not adequately express the importance of participation. **Due to the ambiguous reason(s) for lack of parent respondents, additional efforts should be made to determine ways to increase parent participation in future research studies.**

Parent advocacy, cost and satisfaction. Parents were asked many questions about their level of satisfaction with services provided through the public school district. Specifically, parents were asked satisfaction questions about the type of goals set for their child, the child's progress toward those goals, components of general education (e.g., level of involvement, peer relations in general education), and with multiple specific service/support areas such as speech services, paraprofessional support, physical therapy, and social work support and overall public school services. Overall, the majority of parents reported some level of satisfaction with these services.

Parents were also asked to indicate actions they had taken to access services for their child with ASD. Parents reported making significant efforts in order to access different services, such as switching schools, relocating, threatening to sue the school, sue the school, participating in due process or a mediation process. Additionally, 85% of the parent respondents indicated they had sought services outside of the public school setting for their child with ASD. Respondents indicated spending between $0 and $100,000 per year for those services.

In summary, the parent findings are somewhat idiosyncratic. Many parents made significant efforts to access better services for their child (e.g., switched schools, threatened to sue the school) and on average, spent over $8,000 per year per child on services outside of the public school. However, parents continued to report an overall satisfaction with the type of goals toward which their child was working, the child's progress toward those goals, components of general education, and almost all specific services received at school (e.g., speech services, paraprofessional support, physical therapy).

Reasons for the nature of the findings are unknown; therefore, future research should be conducted to determine if (1) parents are potentially satisfied *because* of the previous advocacy efforts, (2) parents have low expectations for public schools, thus are, for the most part, satisfied with the services they receive, or (3) additional reasons, separate from satisfaction, as to why parents make considerable efforts to access different services and pay for additional services.

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APPENDIX A

Classroom Observation Tool

(see next page)

ASD-Michigan Classroom Observation Instrument Date:_____ Observer Initials: _____

School Name: _____ Student Number: _____ Time Start/End: _____ /_____

Classroom type (circle all that apply): general education self-contained resource room

General Information (circle one):

During observation, the student...

1. Spends the majority of the time engaging in the following:

   Academic and/or Functional skills Other

2. Is in the general education environment for:

   0-25% 25-50% 50-75% 75-100%

   of the observation period

Categorical Checklist

Indicate occurrence or nonoccurrence of each item

	Student		Room	
Events that occur during observation	**Yes**	**No**	**Yes**	**No**
Paraprofessional support is provided				
Visual supports exist in the environment				
Classwide expectations are posted (i.e., rules)				
Does the student use vocal verbal behavior to communicate basic needs and wants?				
• If "no", Indicate type of AAC (i.e. PECS, sign, VOCA, gesture, switch) or nothing used				
Does he/she make any spontaneous requests?				
Does the student have access to the general education curriculum?				
Observed modification of general educ. materials?				
Teacher/para collects data during observation.				
Does student display difficult or problematic behavior during observation period?				
• If yes, does student have a FBA/BIP				
• Was the BIP implemented?				
Is a token economy system used?				
Student attends a social skills group				
Was a social story used during the observation?				
Was a video modeling procedure used at all during the observation?				
Is the schedule (individual or whole class) in a visual format and accessible to the student?				
Do the actual events follow the visual schedule?				
Observed use of sensory stimulation procedures?				
• If yes, is it contingent on the occurrence of a desired behavior?				

Discrete Behavior Tally

Indicate frequency of each event by slashing through corresponding numeral

Choice opportunities	Corrections	Praise Statements	Receives Reward	Interactions w/peer gen ed	Work Station Tasks	Adaptive skills	Independent task completed
1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9
10	10	10	10	10	10	10	10
11	11	11	11	11	11	11	11
12	12	12	12	12	12	12	12
13	13	13	13	13	13	13	13
14	14	14	14	14	14	14	14
15	15	15	15	15	15	15	15
16	16	16	16	16	16	16	16
17	17	17	17	17	17	17	17
18	18	18	18	18	18	18	18
19	19	19	19	19	19	19	19
20	20	20	20	20	20	20	20
21	21	21	21	21	21	21	21
22	22	22	22	22	22	22	22
23	23	23	23	23	23	23	23
24	24	24	24	24	24	24	24
25	25	25	25	25	25	25	25
26	26	26	26	26	26	26	26
27	27	27	27	27	27	27	27
28	28	28	28	28	28	28	28
29	29	29	29	29	29	29	29
30	30	30	30	30	30	30	30
31	31	31	31	31	31	31	31
32	32	32	32	32	32	32	32
33	33	33	33	33	33	33	33
34	34	34	34	34	34	34	34
35	35	35	35	35	35	35	35
36	36	36	36	36	36	36	36
37	37	37	37	37	37	37	37
38	38	38	38	38	38	38	38
39	39	39	39	39	39	39	39
40	40	40	40	40	40	40	40
41	41	41	41	41	41	41	41
42	42	42	42	42	42	42	42
43	43	43	43	43	43	43	43
44	44	44	44	44	44	44	44
45	45	45	45	45	45	45	45
46	46	46	46	46	46	46	46
47	47	47	47	47	47	47	47
48	48	48	48	48	48	48	48
49	49	49	49	49	49	49	49
50	50	50	50	50	50	50	50

Appendix B

Demographic Information of Targeted Students by County Region and Socioeconomic Level

	Socioeconomic Level			Geographic Region				
	Low (N=78)	Middle (N = 64)	High (N = 52)	SW (N = 46)	Thumb/Mid (N = 36)	SE/noT (N = 22)	Tri (N = 82)	UP/N (N = 8)
Gender (% female)	14.3%	25.0%	17.3%	28.3%	19.4%	13.6%	15.9%	0.0%
Race (% non-white)	38.5%	35.9%	15.4%	34.8%	27.8%	13.6%	39.0%	12.5%
Diagnosis (% with Autism Disorder)	80.8%	75.0%	82.7%	78.3%	72.2%	68.2%	85.4%	87.0%
Grade Level (% in grades 10-12)	16.4%	9.4%	21.2%	15.1%	16.7%	18.2%	14.7%	0.0%

APPENDIX C

NSP Category	NSP Definition (NSP, 2009, pg. 32)
Established	Sufficient evidence is available to confidently determine that a treatment produces beneficial treatment effects for individuals on the autism spectrum. That is, these treatments are established as effective.
Emerging	Although one or more studies suggest that a treatment produces beneficial treatment effects for individuals with ASD, additional high quality studies must consistently show this outcome before we can draw firm conclusions about treatment effectiveness.
Unestablished	There is little or no evidence to allow us to draw firm conclusions about treatment effectiveness with individuals with ASD. Additional research may show the treatment to be effective, ineffective, or harmful.
Ineffective/Harmful	Sufficient evidence is available to determine that a treatment is ineffective or harmful for individuals on the autism spectrum.
NPDC on ASD Category	**NPDC on ASD Definition** (http://autismpdc.fpg.unc.edu/content/evidence-based-practices)
Evidence-based Practice	Efficacy must be established through peer-reviewed research in scientific journals using: • randomized or quasi-experimental design studies. Two high quality experimental or quasi-experimental group design studies, • single-subject design studies. Three different investigators or research groups must have conducted five high quality single subject design studies, or • combination of evidence. One high quality randomized or quasi-experimental group design study and three high quality single subject design studies conducted by at least three different investigators or research groups (across the group and single subject design studies).

APPENDIX D

Number and (percentage) of respondents' level of satisfaction and dissatisfaction for each service provided to the child by the public school system.

	Extre. Dissat.	Dissat.	Slightly Dissat.	Neutral	Slightly Sat.	Sat.	Extre. Sat.
Speech and Language	1 (3%)	2 (7%)	2 (7%)	0 (0%)	8 (28%)	10 (34%)	6 (21%)
Resource Room	0 (0%)	0 (0%)	0 (0%)	4 (24%)	3 (18%)	5 (29%)	5 (29%)
General Education	3 (10%)	0 (0%)	5 (17%)	0 (0%)	4 (13%)	9 (30%)	9 (30%)
Self-contained Special Education	0 (0%)	2 (13%)	2 (13%)	0 (0%)	1 (7%)	4 (27%)	6 (40%)
Para-professional	0 (0%)	1 (4%)	3 (11%)	1 (4%)	4 (14%)	9 (32%)	10 (36%)
Physical Therapy	0 (0%)	0 (0%)	0 (0%)	1 (17%)	0 (0%)	3 (50%)	2 (30%)
Occupational Therapy	1 (4%)	2 (8%)	3 (13%)	2 (8%)	2 (8%)	7 (29%)	7 (29%)
Social Work Services	1 (4%)	2 (8%)	2 (8%)	3 (12%)	4 (15%)	12 (46%)	5 (19%)
Homebound Services	1 (50%)	0 (0%)	0 (0%)	0 (0%)	1 (50%)	0 (0%)	0 (0%)
School/Parent Communication	2 (6%)	2 (6%)	3 (9%)	2 (6%)	3 (9%)	15 (44%)	7 (21%)
Opportunity for Parent Involvement	2 (6%)	0 (0%)	3 (9%)	5 (15%)	2 (6%)	11 (33%)	10 (30%)
Extracurricular Activities	5 (16%)	1 (3%)	3 (10%)	5 (16%)	3 (10%)	7 (23%)	7 (23%)
Other	2 (40%)	1 (20%)	1 (20%)	0 (0%)	0 (0%)	1 (20%)	0 (0%)
Overall public School service	3 (9%)	2 (6%)	3 (9%)	0 (0%)	8 (24%)	11 (33%)	6 (18%)

Note. Extremely Dissatisfied (Extre. Dissat.), Dissatisfied (Dissat.), Slightly Dissatisfied (Slightly Dissat.), Slightly Satisfied (Slightly Sat.), Satisfied (Sat.), and Extremely Satisfied (Extre. Sat.).

APPENDIX E

Demographic Information of Targeted Students by County Region and Socioeconomic Level

	Socioeconomic Level			Geographic Region				
	Low (N=78)	Middle (N = 64)	High (N = 52)	SW (N = 46)	Thumb/Mid (N = 36)	SE/noT (N = 22)	Tri (N = 82)	UP/N (N = 8)
Gender (% female)	14.3%	25.0%	17.3%	28.3%	19.4%	13.6%	15.9%	0.0%
Race (% non-white)	38.5%	35.9%	15.4%	34.8%	27.8%	13.6%	39.0%	12.5%
Diagnosis (% with Autism Disorder)	80.8%	75.0%	82.7%	78.3%	72.2%	68.2%	85.4%	87.0%
Grade Level (% in grades 10-12)	16.4%	9.4%	21.2%	15.1%	16.7%	18.2%	14.7%	0.0%

Note. SW = Southwest; Thumb/Mid = Thumb and Mid-Michigan, SE/noT = Southeast, but not including Tri-county area, Tri = Tri-county area of Macomb, Oakland, and Wayne Counties, UP/N = Upper Peninsula and Northern Michigan.