Special Education in Ohio

Best Practices, Costs, and Policy Implications

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Contents

Exhibits

Executive Summary

The Ohio Department of Education (ODE) contracted with the American Institutes for Research® (AIR®) to identify best practices for providing special education and related services to students with disabilities, including educational and assistive technology, and to calculate the associated costs. Additionally, this study compares the current Ohio state funding formula with the estimated costs of implementing best practices to inform state discussions around potential changes in state funding policy. Last, this study includes a review of how other states fund special education and how federal policy may shape state funding decisions. Specifically, this study answers the following research questions (RQs):

RQ1. What are the best practices for special education and related services that provide students with an adequate education as defined by meeting the standards described in *Each Child Means Each Child* (ODE, n.d.b)?

RQ2. What are the best practices for using technology to serve students with disabilities? How was technology leveraged to serve students with disabilities during the COVID-19 pandemic?

RQ3. What is the per-student cost of implementing the identified best practices for special education and related services in Ohio? How are the per-student costs of best practices broken out by special education program component (screening, initial identification, reevaluation, direct service, indirect service, and case management)?

RQ4. How does the current per-student funding of special education and related services practices compare with the estimated costs of best practices? How do differences between funding and estimated costs of best practices vary by disability classification?

RQ5. Nationally, how do states fund their special education programs?

RQ6. How can the Ohio Department of Education create a funding policy that encourages statewide implementation of identified best practices?

RQ7. What role does federal funding play in paying for special education services for students with disabilities? How has the funding given to states to provide services and supports to students with disabilities under the Individuals with Disabilities Education Act funding changed since its passage in 1990?[1]

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[1] The federal policy review was provided through a separate memo to ODE.

Special Education in Ohio: Best Practices, Costs, and Policy Implications

Methods

This study drew on the experiences of expert practitioners in a professional judgement panel (PJP) approach to identify the best practices for special education and related services for students in each disability classification, along with the resources needed to implement the identified best practices. Interviews and surveys with individuals with experience with serving students with disabilities supplemented information from the PJPs, particularly around the usage of educational and assistive technology. Public and nonpublic stakeholder input sessions were held at after the study to share findings and understand what resonated most with each group.

Information from PJPs about the resources needed to implement best practices was combined with publicly available pricing data to estimate the per-student cost of implementing best practices. The estimated per-student cost of implementing best practices was compared with the current funding formula to highlight areas in which the state may consider changes to their special education funding policy. A policy review of how other states fund special education along with the federal policies and requirements of states were reviewed to inform recommendations of how funding for special education could be changed in Ohio.

Findings

The PJPs identified best practices across multiple components of special education and related services, including multidisciplinary teams, case management, technology, indirect services, professional development, and transportation.

Evidence-Based Best Practices Related to Providing Special Education and Related Services

Panelists articulated the need for students with disabilities to be served (and initially identified) by a multidisciplinary team that includes the student (as appropriate), the family (particularly in early years), and community partners (particularly in later years). Manageable caseloads for special education and related service providers can support a multidisciplinary team approach by affording staff the time to assess students, write reports, update progress notes, provide indirect services, and collaborate to identify strategies to serve each student. Indirect services were described as a best practice to collaborate with and coach other staff to improve services for students with disabilities across academic and nonacademic areas (e.g., extracurriculars, school-based social opportunities, athletics, clubs). Having a common planning time and a manageable caseload were cited as critical components of indirect services.

Special Education in Ohio: Best Practices, Costs, and Policy Implications

Providing adequate professional development opportunities (i.e., opportunities to improve individual practice and the time available to participate in these opportunities) was described as a critical best practice for serving students with disabilities. Panelists and stakeholder groups agreed that professional development opportunities should be provided for all staff (e.g., bus drivers, cafeteria staff, office staff) to support the education of all students with whom staff members have contact. Access to distilled research from the state was also described as a component that could support the implementation of best practices. Panelists described that a minimum of three additional professional development days for special education and related service staff would support staff in meeting the unique needs of students with disabilities.

Transporting students with disabilities alongside students without a disability was identified as another best practice. To accomplish this, panelists and stakeholders agreed that there must be planned time for boarding and deboarding transportation that does not impact the length of the school day (i.e., arriving late or leaving early). Assigned equipment for each student (e.g., bus harness) can decrease loss and mix-ups among students. Professional development for bus staff (e.g., deescalation strategies and assistive technology usage) was described as a critical component of transportation best practices.

Evidence-Based Best Practices Related to the Use of Technology

The use of technology during COVID-19-related school closures led to lessons about the use of technology now that schools are open. For example, study participants (panelists, interviewees, and survey respondents) agreed that the use of technology has increased parental engagement an accessibility for instructional activities and assessments. Adequate infrastructure, described as sufficient connectivity, access to appropriate assistive technology devices, and a sufficient number of fully operational educational and assistive technology devices, was identified as a best practice.

Cost of Implementing Best Practices

Findings from this study show that the current funding weights are lower than the funding weights that would be necessary to cover the estimated per-student cost of implementing best practices for all disability classifications. Furthermore, the current funding categories are misaligned with the estimated per-student cost of implementing best practices and that a regrouping of disability classifications may more closely represent the variation in costs of serving students in each disability classification.

State and Federal Special Education Funding Policies

The state policy review summarizes the funding basis (student count, resource ratios, or expenditures) and distribution mechanisms that other states use to fund special education and related services. Distribution mechanisms include student weights or fixed-dollar grants per-

student, fixed dollar grants per instructional unit, and cost reimbursement. Cost considerations, motivational effects, and administrative efficiency are all considerations the state should discuss when changing the special education funding formula.

Recommendations

A best practice for funding formulas overall is to review weights every 5 years to gather new information that informs funding formula updates and revisions. These periodic updates to the funding formula are a form of continuous improvement and help the state respond to changing needs in the field.

Study findings highlight a need to update the existing funding formula to ensure appropriate and equitable funding for special education programs statewide. Specifically, the evidence in this study leads to the following recommendations, which must be considered alongside the findings from other studies commissioned by Senate Bill 310.

Funding Formula Recommendations

In addition to these funding formula recommendations, the state should consider the impact of special education funding changes in context with other potential changes to the student funding formula (e.g., English learners).

- Revise the funding categories so they correspond to student disability and need.
- Recalibrate existing weights to reflect cost-based evidence.

Field-Generated Recommendations

In addition to funding recommendations, study findings led to the following field-generated recommendations.

- Develop guidance and provide the resources necessary to include a multidisciplinary team in the identification, evaluation, and support of students with disabilities.
- Increase the amount of professional development time that special educators and related service providers receive.

Special Education in Ohio: Best Practices, Costs, and Policy Implications

Introduction

The American Institutes for Research® (AIR®) conducted a study of the special education and related services for students with disabilities in Ohio. Specifically, this work answered the research questions listed in Exhibit 1.

Exhibit 1. Research Questions

RQ1. What are the best practices for special education and related services that provide students with an adequate education as defined by meeting the standards described in *Each Child Means Each Child* (ODE, n.d.b)?
RQ2. What are the best practices for using technology to serve students with disabilities? How was technology leveraged to serve students with disabilities during the COVID-19 pandemic?
RQ3. What is the per-student cost of implementing the identified best practices for special education and related services in Ohio? How are the per-student costs of best practices broken out by special education program component (screening, initial identification, reevaluation, direct service, indirect service, and case management)?
RQ4. How does the current per-student funding of special education and related services practices compare with the estimated costs of best practices? How do differences between funding and estimated costs of best practices vary by disability classification?
RQ5. Nationally, how do states fund their special education programs?
RQ6. How can the Ohio Department of Education create a funding policy that encourages statewide implementation of identified best practices?
RQ7. What role does federal funding play in paying for special education services for students with disabilities? How has the funding given to states to provide services and supports to students with disabilities under the Individuals with Disabilities Education Act funding changed since its passage in 1990?

We employed various methodologies strategically to answer these questions, including the professional judgment panel (PJP) approach, interviews, surveys, and policy reviews. Findings from the research questions listed in the table will help inform discussions around policy development that encourages best practices for providing special education and related services to students with disabilities. This report includes strategic and specific policy recommendations that can be discussed with Ohio Department of Education (ODE) leadership to inform future policy decisions.

This report begins by outlining the methodologies used to approach each study component and then describes the findings associated with each research question. Detailed findings are followed by a synthesis of results across all research questions and recommendations about how to this information can be used to inform policy discussions The report ends with a description of the study limitations to contextualize the findings.

Methods

This section describes the methods used to answer the research questions in this study. The PJP approach helped to define best practices (RQ1 and RQ2) and enumerate the resources needed to implement the identified best practices to estimate their costs (RQ3). Semistructured interviews were conducted and surveys were administered to collect information about the use of technology and associated best practices (RQ2). Elaborate resource cost models were used to calculate the costs of best practices (Chambers, 1999). A comprehensive policy review was conducted to inform our work on the policy-related questions (RQ3 and RQ4). We reviewed state policies for funding special education to provide information about how other states disseminate funds and the options available to ODE (RQ5 and RQ6). Finally, we reviewed federal policies to describe the role of federal funding for special education and related services (RQ7).[2] The following subsections describe each methodology and how the methods were applied to answer the research questions.

Professional Judgment Panel Approach

To understand the best practices for providing students with disabilities special education and related services (including educational and assistive technology) and their corresponding costs, we employed a PJP approach. Historically, the PJP approach is a key method for capturing information on best practices in terms of educational programming, required resources (personnel and nonpersonnel), and assessing their costs (Chambers & Levin, 2009). Previous applications of the PJP approach include special education as a program-level component of an overall school program (Chambers et al., 2004, 2006, 2008; Levin et al., 2018). To the best of our knowledge, this study is the first application of the PJP approach that focuses solely on special education and uses students as the unit of analysis.

The PJP approach required us to create panels of expert practitioners to (a) describe the best practices for screening, initial identification, reevaluation, direct services, indirect services, case management, and technology and (b) determine the resources needed to efficiently achieve these best practices. Consistent with focus group methodology, each panel comprised six to 12 people to maximize participation and engagement. The process of identifying best practices and resources needed for implementing and sustaining the identified best practices relied on the expertise of panel members in serving students with disabilities and their collective

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[2] Findings related to RQ7 will be provided in a separate memo around federal policy for funding special education and related services.

Special Education in Ohio: Best Practices, Costs, and Policy Implications

discussions as they arrived at consensus. Next, we describe the PJP recruitment process, applicant selection, and the activities completed during and between panel sessions.

Panelist Recruitment

The online application, along with an email describing the study, was sent to school leaders across the state (i.e., school principals and district superintendents) and the Ohio Coalition for the Education of Children with Disabilities (OCECD). School leaders were asked to pass along the recruitment emails to individuals in their school or district whom they felt were expert practitioners with extensive experience and success in serving students with disabilities. The research team worked with OCECD to consider including the parent perspective, given the important role of parents in the special education design and delivery process. OCECD supported the recruitment of parent mentors and parent information and training representatives to participate on the panels by sharing recruitment materials with their staff and board. Eighty-six individuals across the state completed the online application process.

A key goal of recruitment was to identify expert practitioners across Ohio who represented a variety of professional roles (e.g., special educator, related service provider, parent mentor, special education coordinator). The research team worked with ODE to determine the best way to recruit expert practitioners for the PJPs. Based on ODE's guidance, the team developed an online application. Applicants provided information about their areas of expertise, their current and most recent district assignment, and why they felt their experiences make them good candidates for participation on the panels.[3] In addition, the application included demographic questions to ensure, to the extent possible, that panels represented the diverse, lived experiences of Ohioans.

Panelist Selection

The research team first divided the Ohio disability classifications into two groups to ensure we had adequate experience and expertise on each panel to thoroughly discuss all disabilities (Exhibit 2). The disability groups were used with panelist application information to assign applicants to an appropriate panel based on their current and prior roles and experience.

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[3] Staff working in multiple districts were instructed to enter the district where they spend most of their time serving students with disabilities.

Special Education in Ohio: Best Practices, Costs, and Policy Implications

Exhibit 2. Disabilities Covered Within Each Disability Group

Disability Group 1	Disability Group 2
Speech or language impairment	Autism
Specific learning disability	Intellectual disability
Developmental delay	Multiple disabilities
Other health impairment (major and minor)	Traumatic brain injury
Emotional disturbance	Visual impairment (including blindness)
Orthopedic impairment	Hearing impairment
	Deafness and deaf-blindness

The study team then used the Ohio's State Support Team regions (Exhibit 3) divided into four quadrants to organize applicants in a way that ensured geographic representation (Exhibit 4).

Exhibit 3. Map of Ohio Educational Regions

Note. Outlines are based on the counties that make up the State Support Team regions per legislation. This map is based on school district boundaries and is based on which region the school districts are getting their school improvement services from. This map was designed by Paul Conaway, with ODE (April 14, 2011; https://www.sstr1.org/files/SST_Regions.pdf).

Special Education in Ohio: Best Practices, Costs, and Policy Implications

Exhibit 4. Description of Regions Included in Each Panel and Quadrant

Panel	Regions	Quadrant(s)
Disability Group 1: Quadrant 1	7, 8, 9, 11	Central
Disability Group 1: Quadrant 2	2, 3, 4, 5	Northeast
Disability Group 1: Quadrant 3	14, 15, 16, 12	Southeast
Disability Group 1: Quadrant 4	1, 6, 10, 13	West
Disability Group 2: Quadrants 1 and 2	7, 8, 9, 11, 2, 3, 4, 5	Central, Northeast
Disability Group 2: Quadrants 3 and 4	1, 6, 10, 13, 14, 15, 16, 12	West, Southeast

Essential to the PJP approach is the assumption that panelists are expert practitioners who can articulate and define best practices for special education and related services, including the use of educational and assistive technology. In addition to the information provided by applicants about their experiences and professional roles, we included an empirical measure of districts' effectiveness in serving students with disabilities through a beating-the-odds (BTO) analysis. This analysis used student performance data and district characteristics to identify those districts in which students with disabilities are performing better than expected based on those characteristics. (More information about the BTO analysis is in Appendix A.) In this way, we identified districts across the state in which we can assume that best practices are being implemented and focused our panelist selection on applicants who work (or recently worked) in those districts. We considered the BTO scores of the districts in which our 86 applicants currently work (or worked within the last 5 years) and analyzed applicant experience, credentials, and roles held throughout their career to develop panels with extensive and varied experience in serving students with disabilities (Exhibit 5; selected panelist bios are in Appendix A).

Exhibit 5. Summary of Panelist Positions Represented

Disability Group and Quadrant	Number of panelists	Positions represented
Disability Group 1: Quadrant 1	11	Special education director/coordinator Superintendent/assistant superintendent Principal/assistant principal Related service provider Intervention specialist
Disability Group 1: Quadrant 2	6	Parent mentor Special education director/coordinator Related service provider Intervention specialist Related service provider

Special Education in Ohio: Best Practices, Costs, and Policy Implications

Disability Group and Quadrant	Number of panelists	Positions represented
Disability Group 1: Quadrant 3	7	Outside agency partner/provider Related service provider Parent training and information center staff Special education director/coordinator
Disability Group 1: Quadrant 4	12	Special education director/coordinator Intervention specialist Related service provider Outside agency partner/provider
Disability Group 2: Quadrants 1 and 2	8	Special education director/coordinator Principal/assistant principal Intervention specialist Superintendent/assistant superintendent
Disability Group 2: Quadrants 3 and 4	9	Special education director/coordinator Outside agency partner/provider Intervention specialist

Panelist Activities

Panelists attended a series of meetings in which they were asked to provide input on best practices for serving students with disabilities and the personnel and nonpersonnel resources necessary to support the services they described. When using the PJP approach, the work of the panels must focus on whether students achieve a defined set of goals or outcomes, referred to as a Goals Statement. For this study, the panel work was driven by ODE's Goals Statement for all students included in *Each Child Means Each Child: Ohio's Plan to Improve Learning Experiences and Outcomes for Students With Disabilities* (n.d.b). The work of the panels also was informed by the *Each Child, Our Future: Ohio's Strategic Plan for Education* (n.d.c), the *Ohio Operating Standards for Special Education* (n.d.d), and *Ohio's System of General Supervision* (n.d.e; see Appendix A). Together, these principles and the Goals Statement guided panel deliberations about how to define best practices for evaluation, direct, indirect, case management, and technology supports for students with disabilities.

ODE Goals Statement

Meet the needs of the whole child, which is an opportunity to ensure positive and meaningful educational experiences for students with disabilities that will lead to academic and postsecondary success.

Each panelist meeting had a minimum of three AIR research team members in attendance: a facilitator, a note taker, and a senior-level observer to assist the facilitator in addressing panelists' questions as needed. Furthermore, each meeting was recorded (with panelists' permission) so that the note taker could refer to the recording to ensure that panelists' ideas and discussion

were accurately captured. Panelists were asked to attend a total of seven PJP sessions, four of which were disability group and quadrant specific and three were summary sessions for each disability group. Each meeting included discussion activities and a homework assignment for informing subsequent meetings. (A summary of panel activities is in Appendix A.)

Panelists were encouraged to use a set of guiding principles in their deliberations about best practices and resource specifications described by the acronym GEER (Exhibit 6). The GEER principles helped focus the discussion and ensured that the process for identifying best practices in the initial meetings and corresponding resources generated by the PJPs in subsequent sessions were well aligned with the goals, supported by research evidence when possible, efficient, and reasonable (i.e., could be realistically implemented by competent staff provided sufficient funding was available).

Exhibit 6. Principles of GEER

Principle	Description
Goal	The best practices needed to achieve the study **goals statement**.
Evidence	The best practices are supported by **evidence** when possible.
Efficient	The best practices are based on the most **efficient** combinations of various resources.
Realistic	The best practices are **realistic** in having a reasonable chance of being implemented by competent staff provided sufficient funding was available.

In the first two PJP sessions, panelists were guided through a variety of activities to identify the best practices for serving students with disabilities to reach the defined goal (i.e., ODE Goals Statement). These sessions included deliberations about what services and supports should be included in best practices and how best practice varies across disability classifications. Panelists defined best practices within the following program elements: screening, initial identification, reevaluation, professional development, direct services, indirect services, and case management. (See Exhibit 7 for an operationalized definition of each program element.)

After defining best practices in Sessions 1 and 2, panelists described the resources needed to implement these practices in Sessions 3 and 4. Although some nonpersonnel resources were noted (e.g., adaptive seating, curricular intervention materials), staff time (i.e., personnel resources) was described as critical to achieve best practice. PJP facilitators requested the panelists discuss each disability classification and the set of special education services and supports needed to implement the defined best practices. Panelists were guided through exercises in which they considered a variety of staff positions and the service time needed to implement best practices.

Exhibit 7. Best Practices Program Elements and Operationalized Definitions

Program element	Operationalized definition provided to panelists
Screening	Procedures to identify students potentially in need of special education and related services. Include only resources used for those screening procedures beyond what students without disabilities receive.
Initial identification	The process through which students are initially identified for special education and related services. Includes the comprehensive evaluation to identify students with disabilities and the required services and supports. Also includes only resources used for those evaluation procedures beyond what students without disabilities receive.
Reevaluation	The process, typically triennially, by which students are reevaluated to determine whether they continue to meet the criteria for receiving special education and/or related services and how their needs may have changed.
Professional development	Training opportunities for any staff to learn more about strategies and supports for students with disabilities, including coaching. Include only resources used for professional development opportunities that focus on providing services and supports to students with disabilities.
Direct services[a]	Services provided directly to the student, including special education and related services (e.g., transportation), along with supplementary services and supports.
Indirect services[a]	Services provided to another staff member to support a student with a disability.
Case management[a]	This accounts for time to develop individualized education program (IEP) goals, document IEP progress, and file service notes (as applicable).

Note. Screening was discussed at the school level; all other program elements were discussed at the student level.
[a] Resource specifications for direct services, indirect services, and case management were collected separately for each disability classification, whereas resources specified for screening, initial identification, and reevaluation were the same across disability categories. This decision was made by the panelists, as this is how they reported handling these components of their special education program.

For Sessions 5, 6, and 7, panels were combined to produce two summary panels, one for each disability group (i.e., a summary panel for Disability Group 1 and one for Disability Group 2). In Session 5, panelists discussed the specific professional development opportunities needed for each staff position called out in the service model to implement best practices. Panelists explored best practices for transportation supports needed by students with disabilities. Session 6 activities included a review of the data compiled across panel discussions and homework assignments to discuss resource descriptions in which consensus had not been achieved. In Session 7, panelists reviewed the cost figures graphically and numerically to identify and discuss the efficiency of the resource specifications they provided. (The cost study methodology is in the next section.)

Interviews

Interviews helped expand on the information raised in the PJPs and further understand how service providers, schools, and districts leveraged technology to serve students with disabilities during the COVID-19 pandemic. Additionally, information from interviews helped us understand how technology continues to be used in education to meet the needs of students with disabilities. In addition, interviews helped us understand how assistive technology is used to provide special education and related services to students with disabilities. The semistructured interview protocol (see Appendix B) included questions about the interviewee's specific role regarding the use of educational and assistive technology and the professional development opportunities and infrastructure supports that were available during COVID-19-related school closures and are available now that schools are operating more normally.

To identify individuals with expertise in the areas of educational and assistive technology, an email with an online application link was sent to staff identified in the Ohio Educational Directory System (OEDS) as serving students with disabilities, including technology coordinators, special education coordinators, special educators, and related service providers. The application (in Appendix B) included questions about the individual's experience using educational and assistive technology to support students with disabilities, along with an open-ended item to explain their expertise and experience.

We conducted six interviews with representatives across Ohio, including special educators, school and district special education coordinators, an assistive technology specialist, and a related service provider. Three interviewees had more than 20 years of experience in special education, one had 6–10 years, and two had between 1 and 5 years of experience. Interviews were conducted virtually with a main interviewer and a note taker, and all interviews were recorded (with participant permission).

Survey

Using information from the semistructured interviews conducted for this study and drawing from surveys used in other studies about educational and assistive technology, we developed an online survey for practitioners. This survey instrument gathered information from a broader set of respondents about how individuals leveraged technology to serve students with disabilities during COVID-19-related school closures and how technology continues to serve students with disabilities now that schools are operating more typically. The survey included items asking about the types of professional development available, professional development opportunities not provided but needed, and infrastructure supports, both available and needed, to improve the use of educational and assistive technology. Finally, the survey included items about the respondent's current position, district assignment, and years of experience.

Special Education in Ohio: Best Practices, Costs, and Policy Implications

The survey was administered in September 2022 to staff identified in OEDS as serving students with disabilities, including technology coordinators, special education coordinators, special educators, and related service providers. The survey was sent to leaders at the OCECD and Ohio Center for Autism and Low Incidence, who then sent it through their own distribution list. We received nearly 250 survey responses during the 2-week survey window. Respondent positions were collapsed into classroom-, school-, and district-level position categories (Exhibit 8). A descriptive analysis of the survey data showed that respondents possess varying levels of experience; 26% have between 1 and 5 years, 24% have 6–10 years, 27% have between 11 and 20 years, and the remaining 23% have more than 20 years of experience.

Exhibit 8. Survey Respondent Position Types Collapsed by Service Level

Collapsed position categories (percentage of total sample)	Position indicated on survey (percentage of total sample)
Classroom level (59%)	Special educator (58%)
	General educator (1%)
	Teaching assistant (0.4%)
School level (28%)	Related service provider (21%)
	School counselor (1%)
	School technology coordinator (2%)
	Assistive technology coordinator (3%)
	Special education coordinator (3%)
	Principal (1%)
	Assistant principal (0.4%)
District level (14%)	District special education coordinator (12%)
	District technology coordinator (1%)
	District assistive technology coordinator (1%)
	Superintendent (0.4%)

Note. The sum of percentages across all positions is greater than 100%, and the sum of percentages within a level is greater than the reported percentage by level because individuals could select multiple roles.

Survey data were analyzed to understand how the respondents answered each question, along with how respondents from each collapsed position type (i.e., classroom, school, and district levels) answered each question. Survey responses were analyzed to understand the use of educational and assistive technology in serving students with disabilities, along with the professional development and infrastructure supports available and needed to improve the use of technology.

Special Education in Ohio: Best Practices, Costs, and Policy Implications

Stakeholder Input

We sought stakeholder input to determine whether our findings from PJPs, interviews, and surveys aligned with stakeholder understanding of best practices and their experiences in the field. We worked with ODE to identify stakeholders that covered a range of interests and expertise in the field of special education in Ohio (see Appendix B.6). Stakeholders were divided into two distinct groups: those representing public education settings and those representing nonpublic education settings. We held three public stakeholder sessions and one nonpublic stakeholder session to gather feedback.

Each stakeholder session used the same agenda (summarized in Appendix B.6). First, we provided an overview of the project including targeted research questions and methodologies used. Next, we summarized our main findings around the best practices for serving students with disabilities, which were gathered from the PJPs, interviews, and survey. Finally, we used Jamboard to gather feedback on which themes the stakeholders felt were consistent with the services they provide and/or observe (based on the role of the individual stakeholder) in their work and discussed any differences.

The purpose of the stakeholder input sessions was to understand whether the findings from other data collection methodologies (i.e., PJPs, interviews, surveys) aligned with stakeholders' experiences in the field. Information from the stakeholder input sessions is woven throughout the report.

Estimating Costs

The use of PJPs to estimate the cost of implementing best practices for students with disabilities in Ohio draws on the ingredients approach for the economic evaluation of educational programming (Levin et al., 2018) and the *Standards for Economic Evaluation of Educational and Social Programs* (Cost Analysis Standards Project, 2021). The approach comprises a systematic procedure for identifying all resources used to produce educational outcomes and their associated costs.

We leveraged the ingredients approach to calculate the cost across the specific components of special education and related services (i.e., screening, initial evaluation, reevaluation, direct services, indirect services, and case management). For example, a speech language therapist may spend 30 minutes each week providing direct services to a student with a disability and an additional hour of time providing indirect service to that student's general educators to ensure that best practices are implemented in the classroom. We recorded this information as direct service time and indirect service time, respectively. This approach allowed panelists to describe comprehensively all resources needed for the implementation of best practices while ensuring no double counting.

The AIR study team created interactive resource cost models (RCMs) used in the PJP sessions to record the personnel and nonpersonnel resources associated with the identified best practices. The RCM is a structured database that organizes data about the resources needed to implement best practices for students with disabilities in Ohio public schools. We compiled information received from panelists about personnel and nonpersonnel resources needed to implement best practices for direct services, indirect services, and case management in the RCMs for each disability classification and grade span (i.e., early childhood, elementary/middle, high). We asked panelists to describe the resources needed for screening (at the school level), initial identification, and reevaluation (at the student level).

Information about personnel included the service time (both direct and indirect) and case management time needed to implement best practices. Information was gathered from PJP activities, including in-session discussion and homework assignments. Panelists chose staff positions from a set list of staff roles defined in the Ohio Education Management Information System (EMIS; ODE, 2021). The RCM used state-level staff compensation information to calculate the value of staff time for each service type and disability (a description of how we calculated staff compensation is in Appendix C.1) to produce results generalizable to Ohio (Cost Analysis Standards Project, 2021). We also captured information about nonpersonnel resources, such as the equipment and materials needed if best practices were implemented.

Policy Review

A detailed review of national policies informed how we examined special education funding for this study. The review of state funding policies for special education, inclusive of the formula used and contingency funding mechanisms, involved studying existing state statutes, regulations, and other policy documents. The review (a) identified the current formulas and policies in place and (b) categorized these formulas according to an established typology that organizes funding formulas according to their basis (e.g., count of students) and mechanism (i.e., approach to distributing aid, such as student weights). We used this information to

- summarize federal requirements with respect to state funding for special education,

- provide a summary of national policies of the funding formulas used by states (for fiscal year [FY] 2020 or 2021),

- review existing evidence (research and policy analyses) on what is known about the motivational effects of different state funding formulas on local decisions and special education service delivery, and

- provide a framework that Ohio policymakers can use to evaluate whether the state's existing formula is aligned with the established policy goals and to consider possible revisions to the formula.

Taken together, the policy review provides policymakers with an overview of key design considerations for evaluating Ohio's existing funding formula and considering potential future policy changes.

Findings

This section describes our findings for each research question posed by this study. We start by summarizing the identified best practices, including those associated with educational and assistive technology and transportation. Next, we describe the estimated costs associated with the implementation of those best practices according to our panelists and how that compares to the current funding. Last, we provide the findings from the policy review and recommendations based on the empirical evidence found in this study.

Best Practices for Serving Students With Disabilities (RQ1 and RQ2)

Panelists provided a great deal of information about best practices across multiple sessions and homework assignments. The evidence-based best practices for which consensus was achieved fell into one of the following categories: multidisciplinary teams, case management, technology, indirect services, professional development, and transportation.

These best practices are not intended to be prescriptive as the special education process fosters the individualized nature of educational programming based on student need. Instead, the identified best practices were described as critical in aligning their work with ODE's Goals Statement for students with disabilities and serve as a justifiable method to estimate the costs of doing so. While the best practices identified in this study can serve as guidance, they should not be interpreted as required. Districts should leverage their autonomy and expertise to develop programs that best serve their students. In the following subsections, we summarize the identified evidence-based best practices as described by the panelists.

Multidisciplinary Teams

Panelists described (and stakeholders agreed) a need for a multidisciplinary team for every disability classification, grade span, and program component (i.e., screening, initial evaluation, reevaluation, direct services, indirect services, and case management). To ensure deeper understanding of student needs, the multidisciplinary team should include a variety of specialists and interventionists, as well as general education teachers and input from parents and family members. The specialist input required varies by student need but may include medical professionals, social workers and counselors, vision specialists, educational audiologists, school psychologists, speech and language pathologists, occupational therapists, orientation and mobility specialists, interpreters, and behavioral interventionists. Furthermore, the team's

Special Education in Ohio: Best Practices, Costs, and Policy Implications

interactions with parents and students should include multicultural and multilingual supports (as well as American Sign Language interpretation and Braille) as needed.

Panelists agreed unanimously that students should continue to receive general education supports alongside their special education supports. For example, if the school has a fully functional multitiered system of supports, panelists agree that students with disabilities should continue to receive those types of supports in addition to their special education and related services.

Multidisciplinary teams were cited as a critical component to transition planning for students with disabilities, both in early childhood and at the high school level. Panelists noted the importance of early childhood connections with students with disabilities as a time to work closely with parents and caregivers to provide training and support. According to panelists, services in early childhood should be delivered by specially trained providers (e.g., speech and language pathologist and occupational therapist), embedded in play, and begin as early as possible. Providers should establish communication systems and supports (e.g., assistive technology devices and interpreters) in collaboration with the family and build relationships with multiple providers to build a cohesive service team.

Panelists emphasized that the role of the multidisciplinary team must adapt to accommodate the needs of older students with disabilities. Panelists explained that a best practice for a multidisciplinary team in the older grades is to include outside agencies in transition planning (e.g., Department of Developmental Disabilities, vocational and educational service centers) and to work closely with families, local businesses, and community agencies to plan opportunities for skill development, relationship building, and job exploration. Panelists reported that a key member of the multidisciplinary team is a transition coordinator, and that they should ensure communication and collaboration across services. Panelists described the student as an essential member of the multidisciplinary team in the older grades and that students should be involved in planning through self-assessments and discussion of interests.

Case Management

Panelists noted that manageable caseloads and staff availability underpin the best practice recommendations in special education. Across disability classifications, panelists noted the time-intensive nature of assessments, reports, and planning (e.g., functional behavioral assessments and behavior improvement plans) for special education and related services. In addition to the time needed for teachers or specialists to conduct progress monitoring, write individualized education programs (IEPs) and progress reports, and conduct evaluations and reevaluations, panelists noted that many students may need one-on-one therapy and/or small-group instruction (two to four students). The combination of planning and reporting with service delivery and

Special Education in Ohio: Best Practices, Costs, and Policy Implications

collaboration make manageable caseloads a key component of the best practices for serving students with disabilities.

Stakeholders echoed the need for manageable caseloads and emphasized the idea that caseloads are not a "magic number." Instead, they described a manageable caseload to include not only a number of students but also the types and frequency of supports (including indirect service) the students need based on their disability classification. Stakeholders urged the state to consider the difference between *workload* and *caseload* when defining guidance for special educator and related service provider caseloads. Additionally, stakeholders explained that a formula to determine caseload should consider implementation of best practices and not the maximum a person can serve under their contract.

Panelists cited the need for additional staff in general (given current staffing shortages), as well as staff who focus specifically on the needs of students with disabilities (e.g., assistive technology specialists, mediators to support the IEP process, school psychologists). Panelists and stakeholders expressed concern about the current staffing shortages and how the lack of staff would be even more problematic if the identified best practices were implemented. Having adequate staff available was described as a prerequisite to meeting the obligation to provide free appropriate public education (FAPE) in the least restrictive environment.

Technology

Information from PJPs, semistructured interviews, and a survey was used to understand the best practices associated with educational and assistive technology. Although information from PJPs helped provide a general understanding of technology components used to serve students with disabilities, interviews and surveys were used to drill down and understand how technology was leveraged during COVID-19-related school closures and how it continues to be used now that schools are open. In this section, we summarize the findings from these data collection efforts.

Technology Usage During COVID-19-Related School Closures

Survey data showed that schools and districts used educational technology to serve students during COVID-19-related school closures by offering remote instruction, remote related services and therapies, meetings and communication with families, and collaborative meetings with staff. The most frequently reported technology-related shifts in operation when schools were closed were the use of Zoom and Google Classroom, plus the purchase of laptops for each

student while assistive technology continued to be used to provide instruction and related services and therapies remotely.[4]

Survey respondents indicated successes resulting from the use of technology during school closures. Of all survey respondents, 55% reported that they experienced increased communication with families, and 40% reported that they saw an increase in family engagement in special education and related services and in the IEP process overall. Interestingly, 70% of the respondents stated they learned more about students' home environments through virtual engagement with the use of technology. The provision of synchronous and asynchronous instruction and/or therapy services was reported as a success by 38% of the respondents. (See Appendix B for a summary of all responses.)

Survey respondents talked about challenges experienced with the use of educational technology during COVID-19-related school closures. For example, 83% of the respondents indicated that the family's capacity to use technology was a challenge in providing special education and related services, whereas 73% reported that the student's capacity to use technology was a challenge. Connectivity (86% of the respondents reported) and low student engagement (72%) were other key challenges experienced by classroom, school, and district staff.

Current Use of Technology

Lessons learned from technology usage during school closures undoubtedly shape the current technology practices and the thinking about best practices. Panelists raised the idea that districts should have a common set of expectations about educational technology usage so that all service providers have a basic understanding of effective strategies. Nearly half of the survey respondents (47%) indicated that their district has a set of common expectations for educational technology competencies for all teachers, whereas 25% reported their district did not and 28% were unsure.

Most survey respondents (60%) indicated that their school's philosophy about educational technology usage in special education settings evolved during the pandemic. Many schools embraced the need for technology in classrooms by either codifying a commitment to provide a device to every student (36%) or making assistive technology more readily available for teachers and related service providers to use (32%). After the pandemic response made educational technology a fixture in instructional practices, survey respondents described this technology to be "extremely helpful" in engaging families in the IEP process (46%), providing increased accessibility to assessments (42%), and assisting in specially designed instruction (40%). As related to the

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[4] Assistive technology as defined on a student's IEP and could be any item, piece of equipment, software program, or product system used to increase, maintain, or improve the functional capabilities of students with disabilities.

development of social interaction and communication skills of students with disabilities, survey respondents view technology as "not helpful" (20% and 15%, respectively).

Infrastructure Available for Technology

Panelists described a need for adequate infrastructure to support the use of educational and assistive technology to implement best practices. Infrastructure from their perspective included connectivity, student devices, and staff to support the use of educational and assistive technology. Panelists felt that best practices would include the presence of consistently reliable high-speed connectivity and reliable equipment (i.e., educational technology and assistive technology) for each student, coupled with the accessibility tools needed to meet a student's unique needs (e.g., specialized mouse, touch screen, key guards, mounting arm). Panelists discussed the need for staff to help set up and continually coach teachers (both special and general educators) on how to best incorporate educational and assistive technology.

Nearly 75% of the survey respondents indicated having access to enough devices (e.g., laptops, tablets) to conduct instruction, whereas only 67% reported having access to reliable high-speed connectivity. The presence of an educational technology specialist or coordinator (i.e., staff trained to set up technology) was reported by 66% of the survey respondents, whereas only 20% reported having access to an assistive technology specialist. The general availability of appropriate applications and software was indicated by only 48% of the survey respondents, and 38% reported having access to ongoing coaching support for technology usage. PJP discussions about the need for adequate infrastructure to support the use of educational and assistive technology indicated that all these conditions and supports would be included as best practices.

Technology-Related Professional Development

The research literature suggests that professional development on using educational and assistive technology throughout instruction and assessment is critical to the adoption and integration of technology (Polly & Hannafin, 2010). The need for professional development opportunities for all staff involved in serving students with disabilities was a common theme across the PJPs, interviews, and surveys. Survey respondents indicated that they currently have opportunities for live virtual (54%), live in-person (50%), and recorded (48%) professional development, along with coaching (31%) and in-class support (27%). Professional development topics covered in 2021–22 were reported to include how to develop and use accessible educational materials (33%), how to plan accessible instruction (28%), and how to increase student engagement using technology (32%). However, half of the survey respondents (51%) reported a need for more professional development about how to use technology for students with sensory impairments and information on how to incorporate assistive technology into instruction (49%). Respondents indicated that more professional development is needed for planning accessible instruction (43%) and developing and using accessible educational materials

(44%). Panelists, interviewees, and stakeholders all agreed that in-the-moment support is needed as technology issues arise.

Indirect Services

The expert panelists identified the coupling of direct services and indirect services as a best practice. Indirect services are broadly defined as consultative services provided by the special education interventionists or related service providers to other staff working with the student to modify the environment, curriculum, or instruction to meet the student's needs. In discussing the essential role of the multidisciplinary team in providing high-quality special education and related services, panelists repeatedly noted the need for support for collaboration and coaching, including administrative support to create common planning and consultation time for teachers, the opportunity to bring specialists (e.g., speech and language pathologists) into the inclusion classroom, and continued opportunities for all staff to develop their skills and expertise about the needs of their students. A key practice noted was that administrators can support this work by creating guaranteed and expected time for specialists and related service providers to plan with general education teachers to help ensure that instruction is accessible from the beginning.

Indirect services were also reported to be an important support to ensure students with disabilities can participate in extracurricular and school-based recreational activities. Panelists noted that indirect services should be leveraged to ensure that all students can participate in school activities—physical education, field trips, recess—safely and fully included with their peers. Dedicated time for indirect services can also help teams develop plans to ensure that students with disabilities are connected to school social opportunities, athletics, and clubs.

Stakeholders emphasized the need for additional staff to allow time for collaboration between service providers so that each student's individual needs can be met at all parts of their school day. They noted the importance of including students with disabilities in all student settings and agreed that both teacher preservice and in-service training should incorporate planning for an inclusive environment.

Professional Development

Comments about professional development training opportunities and coaching supports for staff and parents/caregivers were discussed by panelists across disability categories. High-quality, ongoing professional learning is foundational to the success of implementing best practices in special education and meeting the needs of all students. Panelists cited the importance in this learning beginning in preservice training and suggested connecting with local universities to ensure that education programs are sufficiently preparing future teachers for working with students with disabilities. Panelists also cited preservice preparation in discussing

Special Education in Ohio: Best Practices, Costs, and Policy Implications

the need to hire educators who had completed training on the specific disability they are working with (e.g., autism, developmental delay).

Panelists shared that in-service professional development should be available to all staff to support their knowledge of and skills in creating inclusive learning environments for students with disabilities. Professional development should include topics such as culturally responsive/culturally sustaining teaching, Universal Design for Learning, multisensory curricula, crisis prevention, problem solving and deescalation, restraint and seclusion, and trauma-informed teaching. They underscored the importance of widespread understanding of how to support students with disabilities, and professional development should be available not only to general educators but also to bus drivers, cafeteria workers, office staff, special content area teachers, and other district employees likely to interact with students.

Panelists identified specific best practices for special educators and related service providers, noting that a need exists for access to high-quality research on best practices. Panelists suggested a role for ODE is ensuring that districts have access to research summaries in neurology, social-emotional learning, and assistive technology to strengthen professional learning. Panelists cited the need for professional learning to support the evaluation process, for example, understanding the nuances between education determinations of disability versus medical diagnosis, and training for administration to ensure understanding of the Individuals with Disabilities Education Act (IDEA) of 1990 requirements and the IEP process. Across staff roles and content areas, ongoing research-based and relevant professional development and coaching was cited by panelists as a best practice. Panelists cited the need for adequate time, staffing, and funding to ensure that all staff have the tools they need to support the students they work with. Exhibit 9 summarizes what panelists reported as specific professional development content needed by specific positions.

Stakeholders overwhelmingly agreed with the panelists' findings that additional professional development is necessary for all staff who interact with students with disabilities. Job-embedded coaching was cited as a best practice to ensure that training is ongoing and catered to the needs of both the educator and students.

Exhibit 9. Summary of Professional Development Content Indicated as a Best Practice

Staff type	Content
General educator	• IEP and ETR basics
	• Assessment literacy
	• Dyslexia related trainings

Special Education in Ohio: Best Practices, Costs, and Policy Implications

Staff type	Content
	• Technology use
	• Behavior management strategies (behavior-related disabilities)
	• Instruction on inclusive practices and differentiation
	• Front-loading content
	• Scaffolding practices
	• Social skills
	• Annual review of laws
	• Embedded collaboration training for all levels
	• Coteaching strategies and skills
	• How to meet the diverse needs of students with a disability
Support staff	• IEP and ETR basics
	• Assessment literacy
	• Dyslexia related trainings
	• Deescalation strategies
	• Self-regulation practices
	• Technology use
	• Phonemic awareness training
	• Positive Behavioral Interventions and Supports training
	• Executive functioning skills
	• Feeding therapy training for staff assigned to students with feeding therapy needs
	• Threat assessment training
	• Occupational safety, fire safety, injury reporting
	• Crisis prevention intervention training
	• General acronym knowledge
	• Confidentiality
	• Communication systems/structures and expectations
	• Training to understand other staff role and responsibilities
	• Data entry and management
Intervention specialists	• IEP and ETR basics
	• Instructional strategies that reflect current research

Staff type	Content
	• Technology use
	• Collaboration training
	• Social-emotional learning and trauma-informed care
	• Discipline and manifestation determination
	• Extended standards
	• Coteaching training
	• Serving students on a continuum of placements
	• Crisis prevention intervention training
Related service providers	• Data collection and management
	• Collaboration/relational—adaptive skills

Note. ETR = evaluation team report.

Transportation

Overwhelmingly, panelists explained that it is best practice for students with any disability to be transported with typically developing peers to the extent possible. Although this is a tenant of IDEA (i.e., that students are served in the least restrictive environment), panelists emphasized that transportation should follow suit. For students with mobility issues, a defined best practice is to provide a vehicle with a wheelchair lift and account for the additional time needed to board and deboard students, such that students are not arriving late or leaving school early due to transportation issues (a sentiment echoed across stakeholder input sessions). Panelists described that this would require staff ready at the school with time devoted to deboarding students, along with a bus aide to support the boarding and deboarding processes.

Panelists mentioned that it is essential that students with muscular tone deficiencies (and others who require support during transportation) are assigned this equipment and a specific vehicle as necessary to maintain consistent availability of the required supports (e.g., harness, specialized car seat). Lastly, panelists stated that special training is needed for bus drivers and bus aides. For example, students with emotional disturbance may need someone on the bus who has training in deescalation strategies or restraint techniques to keep everyone on the bus safe. Students with mobility issues or cognitive impairments will benefit from staff trained in how to support them to board and deboard the bus as independently as possible. This could include physical, verbal, or visual prompts that meet a student's accessibility needs and allows for maximum independence.

Special Education in Ohio: Best Practices, Costs, and Policy Implications

Costs Associated With Implementing Best Practices (RQ3 and RQ4)

After the panelists defined the best practices and described the types of resources necessary to support students with disabilities in meeting the Goals Statement, they were asked to describe the quantities of resources needed to implement the identified best practices for students in each disability classification. Resource specifications included personnel time for the service providers required to implement best practices (e.g., special educator, related service provider, paraprofessional) and for the nonpersonnel resource items (e.g., specialized equipment to increase accessibility, educational and assistive technology). Initial resource estimates were entered into an RCM, and the summary panels then reviewed those estimates to ensure they represented an efficient and realistic combination of resources if adequate funding was available. Resource specifications were gathered for each program element (summarized in Exhibit 6) to calculate the respective costs.

Panelists were asked to specify the types and quantities of resources needed on an annual basis to implement best practices for the most common needs of students within each disability classification. However, literature and expert practitioner experience tells us that the services and supports students with any disability need will range and change over time. Therefore, the cost estimates presented here (based on panelist resource specifications) represent what it would take to appropriately serve a student with average needs within each disability classification. In reality, the actual costs will vary for each program element based on the needs of each individual student.

Panelists described how resource usage for each program element (screening, initial evaluation, reevaluation, direct service, indirect service, and case management) may vary based on grade span: early childhood (ages 3–5), elementary/middle, and high school. The cost figures for each disability classification (Exhibit 10) represent an average of the grade-span-specific cost estimates from the resource specifications weighted by the statewide incidences of students across the grade spans to develop a single cost estimate for each disability (costs by grade span are presented in Appendix C).

The estimated per-student cost of implementing best practices for special education and related services varies from $9,760 (speech or language impairment) to $59,098 (other health impairment major). Although the costs associated with direct services, indirect services, and case management vary based on disability classification, the estimated per-student cost of screening, initial identification, and reevaluation are the same across disability classifications. The cost figures in Exhibit 10 and all that follow represent annual dollars for the 2022–23 school year. Exhibit 11 illustrates the percentage share of overall costs associated with each program element for the disability classifications. The largest share of cost is devoted to direct services, followed by indirect services and case management (described in more detail below).

Special Education in Ohio: Best Practices, Costs, and Policy Implications

Exhibit 10. Estimated Annual Per-Student Cost of Implementing Best Practices Across Program Elements by Disability Classification (Overall Per-Student Cost in Bold)

Disability Classification	Screening, initial evaluation, reevaluation	Direct services	Indirect services	Case management	Overall Per-Student Cost
Other health impairment (major)	$1,177	$46,785	$7,612	$3,524	**$59,098**
Traumatic brain injury	$1,177	$47,571	$5,400	$3,038	**$57,186**
Autism	$1,177	$28,817	$4,068	$4,708	**$38,769**
Emotional disturbance	$1,177	$23,991	$5,216	$2,837	**$33,221**
Visual impairment (blindness)	$1,177	$23,905	$4,152	$2,295	**$31,528**
Development delay (EC only)	$1,177	$23,236	$4,202	$2,585	**$31,199**
Intellectual disability	$1,177	$19,883	$6,790	$3,242	**$31,092**
Deaf-blindness	$1,177	$22,703	$4,049	$2,082	**$30,010**
Hearing impairment (deafness)	$1,177	$21,782	$3,799	$2,366	**$29,124**
Multiple disabilities	$1,177	$17,535	$4,344	$3,135	**$26,191**
Orthopedic impairment	$1,177	$14,159	$4,246	$1,864	**$21,446**
Other health impairment (minor)	$1,177	$10,806	$2,546	$2,105	**$16,633**
Specific learning disability	$1,177	$5,709	$2,604	$1,701	**$11,190**
Speech or language impairment	$1,177	$4,755	$2,040	$1,788	**$9,760**

Legend: ■ Screening, initial evaluation, reevaluation □ Direct services ■ Indirect services ▨ Case management

Note. EC is early childhood.

Exhibit 11. Estimated Shares of Annual Per-Student Cost of Implementing Best Practices Across Program Elements by Disability Classification

Disability Classification	Screening, initial evaluation, reevaluation	Direct services	Indirect services	Case management
Other health impairment (major)	2%	79%	13%	6%
Traumatic brain injury	2%	83%	9%	5%
Autism	3%	74%	10%	12%
Emotional disturbance	4%	72%	16%	9%
Visual impairment (blindness)	4%	76%	13%	7%
Development delay (EC only)	4%	74%	13%	8%
Intellectual disability	4%	64%	22%	10%
Deaf-blindness	4%	76%	13%	7%
Hearing impairment (deafness)	4%	75%	13%	8%
Multiple disabilities	4%	67%	17%	12%
Orthopedic impairment	5%	66%	20%	9%
Other health impairment (minor)	7%	65%	15%	13%
Specific learning disability	11%	51%	23%	15%
Speech or language impairment	12%	49%	21%	18%

Legend: ■ Screening, initial evaluation, reevaluation □ Direct services ▣ Indirect services ▨ Case management

Note. EC is early childhood.

Direct service costs constitute 49%–83% of overall cost across all disabilities. The results show that the direct services component for traumatic brain injury (TBI) and major other health impairment (OHI) make up the highest proportion of overall costs (approximately 80%). For speech or language impairment (SLI) and specific learning disability (SLD), direct services account for the lowest proportion of overall costs (approximately 50%). These proportions align with qualitative data obtained from the PJP sessions. For example, students classified as OHI major often have significant medical needs and require an intense amount of direct support to access the state standards. In contrast, students identified under SLI require relatively less direct support.

Indirect service costs range from 9% to 23% of the overall costs across all disabilities. The analysis shows that SLD has the highest proportion of costs associated with indirect services (23%), and TBI accounts for the lowest (9%) overall costs for indirect services. Again, this finding aligns with qualitative data gathered during this study. Panelists explained that if best practices were implemented, then students with SLD would receive more indirect services by using a multidisciplinary team that would meet to strategize about how to best address the student's specific needs. This indirect service time was theorized to enable the student to be more successful with less direct service time, because the general education staff who serve a student with a disability are made more capable of embedding specialized supports into their instruction through the receipt of indirect services. Panelists explained that students with TBI can have a range of needs that typically require direct services, so indirect service time would not be as significant for this population.

Case management costs vary from 5% to 18% of the overall cost. The highest percentage of case management costs is observed in SLI (18%). The lowest percentage of case management costs is in OHI major and TBI (6% and 5%, respectively). The higher percentage for students with SLI is likely a function of the case management tasks required for all students with disabilities (e.g., preparing for annual IEP meetings, monthly Medicare filing) compared with the relative overall cost for this disability. The lower percentage for OHI major and TBI includes those same tasks but spread across a greater overall cost. The cost findings for case management align with the qualitative data. For example, students with SLI typically receive services from fewer staff (i.e., typically a speech language pathologist and a special educator). Therefore, the lower case management costs for SLI (close to $1,800) represent fewer staff completing case management duties. In contrast, a student with OHI major would receive services from a larger team (e.g., special educator, multiple related service providers, nurse), so the case management costs are higher (approximately $3,500).

The costs associated with screening, initial evaluation, and reevaluation account for 2% to 12% of the overall cost across all disability classifications. The resources needed (and subsequent costs) for screening, initial evaluation, and reevaluation were consistent across disability classification. However, because of the relative overall estimated costs for each

disability classification, the costs of screening, initial evaluation, and reevaluation comprise varying proportions of the overall cost.[5]

Professional Development

In Ohio, districts have autonomy to determine how to use their dedicated professional development time, including whole or half days devoted to professional development, collaborative meeting times, and/or embedded coaching models. The content of those professional development opportunities is selected by the district based on the needs of their students and the community. Professional development for staff who serve students with disabilities was cited as a critical piece of the identified best practices. However, the panelists explained that the professional development needed for staff serving students with disabilities should remain a local decision so that the opportunities provided can meet the needs of students and their families. Given the autonomy of the amount of professional development and the range of potential content coverage, there are no cost estimates associated with professional development in this study. Instead, we provide a qualitative description in this section of what panelists described as necessary professional development.

In the summary panels, panelists explained that ideally staff who provide direct services to students with disabilities (e.g., special educators, related service providers, instructional support staff) would receive an additional 3 full days each year (i.e., on top of the district-required professional development days) to learn more about strategies and procedures to support students with disabilities. The cost associated with the proposed 3 additional professional development days are represented in the cost estimates presented here. The study team used the estimated hourly compensation (inclusive of benefits) for special educators and related service providers to add a total of 24 additional hours (three 8-hour days) to the total annual compensation. However, panelists explained that the content of the 3 additional professional development days should match the needs of the district, school, and students they serve.

Nonpersonnel Resources

Panelists were asked to describe the nonpersonnel resources (e.g., materials, equipment) needed to implement best practices for students in each disability classification. The nonpersonnel resources they described ranged from inexpensive (e.g., specialized pencil grips for $2; seating support for $25) to more expensive (e.g., positioning equipment for approximately $4,000; eye gaze technology for $2,000). The types of nonpersonnel materials

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[5] Screening was described as a school-level activity. Often, it occurs only once in a student's educational career; therefore, the expected total cost of screening and initial evaluation for one student is divided equally across 13 years of schooling to estimate this annual cost.

needed for students with disabilities vary based on disability classification, severity of need, and IEP team decisions. Panelists struggled to identify a common set of nonpersonnel resources to best serve the typical student in each disability classification.

In general, we were unable to ascertain the types and quantities of nonpersonnel resources needed to implement best practices for students in each disability classification. Although panelists could list examples of nonpersonnel materials, they were not able to describe them with the specificity required to estimate the associated costs. Given this limitation, we did not generate cost estimates for nonpersonnel resources. Instead, we list the nonpersonnel resources described during panel discussions in Exhibit C.3.1 to show the variety of possible nonpersonnel resources for students with disabilities. The exclusion of the costs of nonpersonnel resources produces lower-bound cost estimates, particularly for those students who require more significant nonpersonnel resources to participate in instructional activities.

Transportation

The key tenet of the best practices that panelists described was that students should be transported as much as possible with their nondisabled peers. The resources needed to implement transportation best practices included staff time (e.g., a bus aide to support boarding and deboarding), equipment (e.g., wheelchair lift, seat harness), and training (e.g., transportation staff with training in deescalation strategies for students with behavioral issues). Panelists also described the various transportation nuances that go into determining how to transport a student with a disability to and from school, such as the availability of vehicles with the required equipment (e.g., wheelchair lift, specialized seats), the locale of the school (e.g., urban versus rural), and family preference (e.g., those families who prefer to transport their children versus using school-provided transportation). Panelists did not come to a consensus on the most common needs for transporting students with disabilities due to the inherent variability in student need, district resources, and locale. Furthermore, transportation is not included in the funding formula for special education. For these reasons, the costs of transportation are not reflected in the provided estimates.

Comparing Costs of Best Practices to Current Funding

In this section, we compare current annual per-student funding levels with the estimated annual per-student costs of implementing best practices based on information gathered from expert practitioners in the PJPs. Current per-student funding levels are based on Ohio's funding formula as it relates to students with disabilities (e.g., see the line-by-line explanation for FY 2023; ODE, 2022c). Because our measures focus only on the cost of implementing best practices beyond the standard general education supports, all funding levels presented in this report represent additional funding provided to students with disabilities in the 2022 fiscal year (i.e., funding beyond the statewide base per-student funding of $7,350.77). To calculate the

Special Education in Ohio: Best Practices, Costs, and Policy Implications

additional funding amount for each disability classification, we multiplied the statewide per-student base funding ($7,350.77) by the funding weights for each special education (ODE, n.d.a).[6] Because ODE groups disability classifications into categories, all the classifications in a category use the same funding weight (Exhibit 12).

Exhibit 12. Current Special Education Funding Categories

Funding category	Fiscal year 2022 funding weight	Disability classifications included in funding category
Category 1	0.244	Specific language impairment
Category 2	0.618	Intellectual disability, specific learning disability, other health impairment minor, and developmental delay
Category 3	1.485	Deafness (hearing impairment) and emotional disturbance
Category 4	1.981	Visual impairment and other health impairment major
Category 5	2.683	Multiple disabilities and orthopedic impairment
Category 6	3.955	Deaf-blindness, autism, and traumatic brain injury

Note. ODE, 2022c.

To derive per-student costs that are comparable with Ohio's six funding categories, we first calculated the cost for each disability classification using a weighted average across school levels according to the proportion of students receiving special education services statewide at each schooling level.

Because five of the six ODE special education funding categories contain more than one classification of disability, we calculated a single cost per category as a weighted average of the disability classification specific costs within each category. Specifically, average costs across the disability classifications in each funding category were weighted according to their statewide incidences. For example, the reported average cost of best practices for Category 6 comes from the calculated per-student costs for students with deaf-blindness, autism, and TBI. To create a

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[6]We used the following formula to calculate funding per student in each category: Additional funding = Applicable category weight × $7,350.77. The state funding formula for additional funding also includes the "district state share percentage," which represents the proportion of total funding provided by the state (versus coming from the district). To represent intended funding levels for students receiving special education services, we did not account for the district state share percentage. Statewide, the district state share percentage is approximately 43%, meaning that, on average, the state pays districts for 43% of intended special education funding levels, and the remainder comes from local revenue.

Special Education in Ohio: Best Practices, Costs, and Policy Implications

single average measure of cost for Category 6, the calculated costs of deaf-blindness, autism, and TBI were weighted by their relative statewide incidence rates in the 2018–19 school year.[7]

Exhibit 13 compares the annual additional funding for students in each disability classification with the estimated annual cost of implementing best practices in the six state-defined special education funding categories. This exhibit shows that in all six categories, per-student funding does not fully cover the estimated per-student cost. The difference between cost and actual funding varies substantially across categories. For example, the cost of best practices in Categories 3 and 4 exceeded the allocated funding by more than $22,000 and $29,000, respectively. Moreover, the cost estimates indicate that the ordering of funding categories does not reflect the true hierarchy of costs across disability categories. For example, students with disabilities in Category 5 receive the second-highest level of additional funding even though Categories 3 and 4 have higher estimated costs per student based on the PJP resource specifications reflecting implementation of best practices. Although the costs presented in Exhibit 13 are estimates, we are confident that students in most categories have additional costs that exceed their additional funding allocation. As a reminder, our cost estimates do not account for nonpersonnel resources and therefore represent lower bound measures.

Calculating the Excess Cost of Implementing Best Practices

Often, students with disabilities receive some amount of special education and related services outside of the general education setting. For example, when a student leaves the general education setting to receive occupational therapy and/or time working with a special educator in a small group, that student is not receiving general education services. As a result, students receiving special education services spend less time in general education services than students without disabilities. As a result, students with disabilities incur lower general education costs. We refer to this trade off as the substitution effect: Special education and related services partially replace or substitute for general education services. Therefore, the value of general education services provided for students with disabilities must be discounted according to the time that students with disabilities receive special education and related services to avoid double counting. Accounting for reduced general education costs allows us to generate a more accurate estimate of the total cost of providing best practices to students with disabilities.

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[7] The relative incidences of disabilities within each funding category were calculated from statewide data from the 2018–19 school year. For example, Category 6 contains autism, TBI, and deafness-blindness, with statewide incidence rates of 1.36%, 0.13%, and 0.01%, respectively. The final cost of Category 6 is (approximately) the sum of 0.9 times of the cost of autism, 0.09 times the cost of TBI, and .01 times the cost of deafness-blindness.

Special Education in Ohio: Best Practices, Costs, and Policy Implications

We define excess cost as this total cost of providing best practices to students with disabilities minus the cost of providing general education to the average non–special education student (see Appendix C.3. for an illustration of this concept).

To account for the substitution effect, we used information on the percentage of students who spend varying amounts of time outside of the general education setting, by disability classification in Ohio (U.S. Department of Education, 2022). The data contain categories of the percentage of time in regular class settings: less than 40%, 40% to 80%, and more than 80%. To estimate an average amount of time, we assumed midpoint values of 20% for the less than 40% category, 60% for the 40% to 80% category, and 90% for the more than 80% category. We then calculated the discounted cost of providing general education services to students with disabilities by multiplying the percentage of time in regular class setting by the statewide average base cost per student ($7,350.77). The substitution effect can be represented by the difference between the discounted cost of providing general education services and the base cost per student, which is assumed to be the average cost of education for a student without disabilities and no additional needs. To appropriately discount the costs of implementing best practices, we subtracted the value of the substitution effect from the estimated costs of implementing best practices.

In Figures 13 through 17, the unadjusted cost (i.e., estimated cost of implementing best practices) is represented with a light blue bar, whereas the cost of implementing best practices adjusted for the substitution effect is represented with a green bar. Because the adjusted cost (expressed in both dollar terms and a relative funding weight) is less than the unadjusted cost and does not account for nonpersonnel resources, it should be interpreted as a lower bound estimate of the cost of implementing best practices. In other words, we are confident that the true costs of best practices are not less than the adjusted costs presented in the following figures. We note that the adjusted cost of best practices exceeds current funding in all funding categories and in nearly all disability classifications.

Exhibit 13. Per-Student Annual Intended Funding Levels Represented by the State Funding Formula Versus Estimated Annual Per-Student Cost of Implementing Best Practices by Special Education Funding Category

Legend:
- ■ Intended funding
- □ Estimated per-student cost of implementing best practices
- ▨ Estimated per-student cost, adjusted for time in general education

Chart values:

Category	Intended funding	Estimated per-student cost of implementing best practices	Estimated per-student cost, adjusted for time in general education
Category 6	$29,075	$39,949	$36,884
Category 5	$19,722	$25,953	$21,615
Category 4	$14,563	$43,992	$41,148
Category 3	$10,912	$33,501	$31,054
Category 2	$4,542	$15,553	$14,049
Category 1	$1,790	$9,914	$9,131

Funding Weights

Although the cost and funding comparisons are informative, funding for students is determined by the funding weights presented in Exhibit 12. These weights are set by ODE policymakers to determine the state's contribution to pay for special education and related services for students in each disability classification. To make our results more useful for policymakers, we converted the disability specific estimated costs of implementing best practices into cost-based funding weights that can be compared with ODE's current funding weights. Our cost-based weights are equivalent to the cost of best practices divided by the base funding per student reported by ODE (i.e., $7,350.77). These estimated cost-based funding weights will generate a per-student annual funding equivalent to the costs of best practices determined in the PJPs. For example, an estimated cost-based funding weight of 2 means that a student in that disability

Special Education in Ohio: Best Practices, Costs, and Policy Implications

classification would receive funding in the amount of $2 \times \$7,350.77 = \$14,701.54$ (in addition to the base cost of \$7,350.77) to cover the cost of implementing best practices.

Exhibit 14 compares the FY2022 Ohio funding weights (ODE, 2022c) with the calculated weights based on the estimated costs of best practices and the adjusted costs of best practices for each funding category. Because the estimated cost-based funding weights are a function of the estimated costs, the relative magnitudes of the values in Exhibit 14 mirror those in Exhibit 13, and the conclusions from Exhibit 13 hold here as well. We again see that ODE's current allocation of funding to each category is less than the allocation based on implementing best practices. In many cases, the estimated cost-based funding weight is more than two or three times ODE's FY2022 funding weight. For example, the current ODE funding weights suggest that students in Category 4 should receive additional funding equivalent to twice the base funding, whereas the estimated funding weights based on the adjusted estimated costs of providing best practices suggest that students in this category should receive additional funding equivalent to 5.6 times the base funding amount. In other words, our estimates suggest that ODE's current Category 4 funding weight is about one third of what it needs to be to implement the identified best practices.

Although funding weights based on both the unadjusted and adjusted costs exceed the current Ohio funding weights, the impact of the adjustment varies across the funding categories. For example, the adjustment for time spent in general education reduces the suggested Category 2 funding weight by about 9.5% (from 2.1 to 1.9). By contrast, the adjustment reduces the suggested Category 5 funding weight by about 17% (from 3.5 to 2.9).

Special Education in Ohio: Best Practices, Costs, and Policy Implications

Exhibit 14. Ohio's Special Education Funding Weights Versus Weights Based on Estimated Costs of Implementing Best Practices by Special Education Funding Category
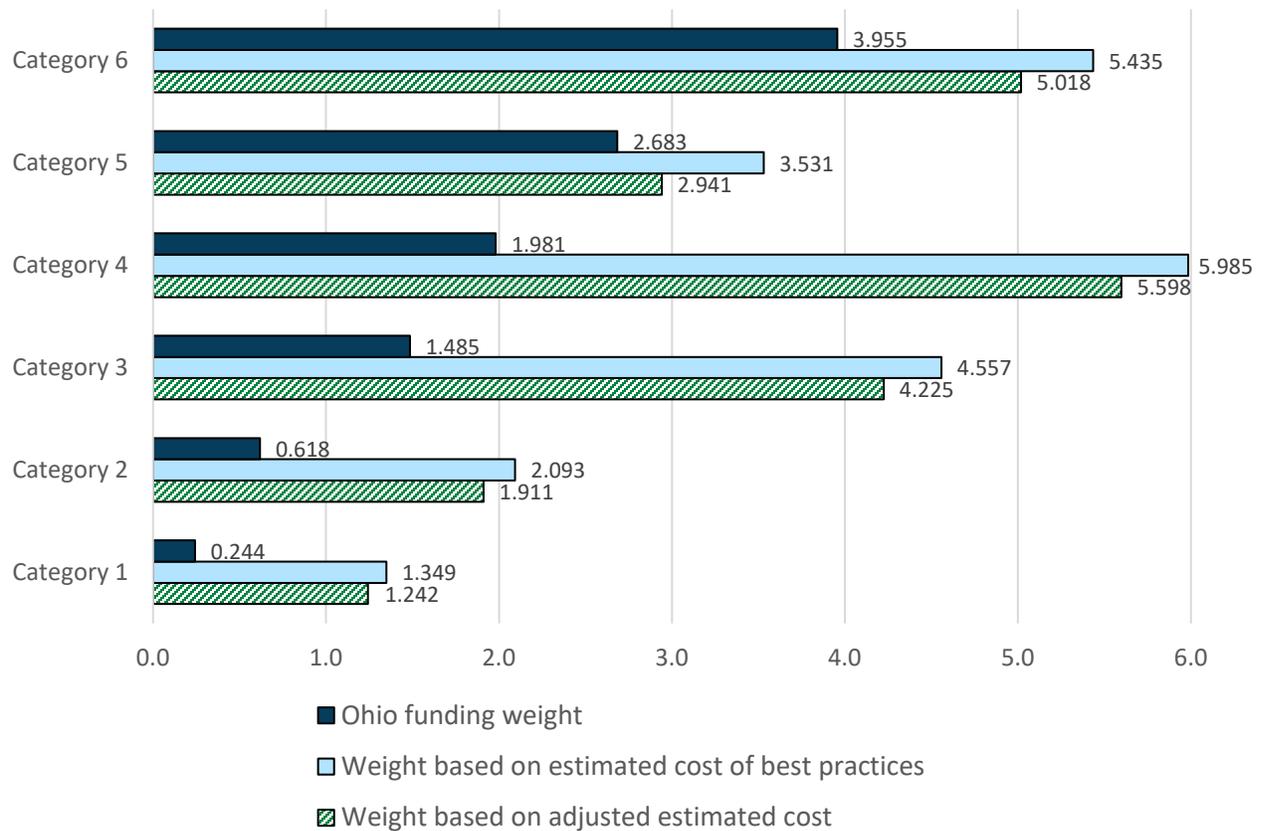
Note. For weights based on PJP cost specifications, we retained the statewide base per-student cost of $7,350.77.

Exhibit 13 indicates that costs of implementing best practices exceed funding for all six funding categories. However, each funding category comprises multiple disability classifications, each with varying costs. To illustrate this variation, Exhibit 15 replicates Exhibit 13 but breaks out the estimated annual costs by disability classifications. The exhibit shows large differences in estimated cost across disability classifications within each funding category. For example, the adjusted estimated cost of best practices for students with TBI (Category 6) exceeds funding by about $26,500, whereas the adjusted cost of best practices for students with deaf-blindness (also Category 6) is below current funding by $2,400. The most severe case is OHI (major), in which the estimated per-student cost exceeds funding by just under $40,500. In percentage terms, speech or language impairment, intellectual disability, and developmental delay are the most underfunded, receiving per-student funding equivalent to 19.6%, 15.9%, and 15.3% of the cost of best practices, respectively. Conversely, multiple disabilities, orthopedic impairment, and deafness-blindness receive per-student funding equivalent to 90.2%, 96.2%, and 109% of the cost of best practices, respectively.

Special Education in Ohio: Best Practices, Costs, and Policy Implications

Exhibit 15 also shows that the ordering of funding categories does not reflect the relative cost of best practices in each disability classification. For example, all disabilities in Categories 3 and 4 have estimated costs that exceed those of the disabilities represented in Category 5, but students in Category 5 receive more funding than students in Categories 3 and 4. The two disability classifications with the highest costs of best practices, other health impairment (major) and TBI, both have adjusted estimated costs of around $55,000. However, because other health impairment (major) is in Category 4, students in that disability classification are allocated funding that is roughly half of that allocated to students with TBI ($14,563 versus $29,075). These findings suggest that the current ODE funding scheme misclassifies some disabilities across funding categories.

Exhibit 16 translates the annual intended per-student funding and estimated per-student cost measures displayed in Exhibit 15 into funding weights. This graph allows us to compare current ODE funding weights with the funding weights based on the estimated per-student costs of implementing best practices. Because the estimated cost-based funding weights are a function of the estimated costs, the relative magnitudes of the values in Exhibit 16 resemble those presented in Exhibit 15. As a result, Exhibit 16 reveals large differences in estimated cost-based weights across disability classifications within each funding category., The grouping of disability classifications into funding categories does not reflect the ordering of costs assumed by Ohio's funding weights. For nearly every disability classification, the existing Ohio funding weight is less than that which would provide students with enough funding to cover the estimated per-student cost of implementing best practices that has been adjusted for time spent in general education. Students with other health impairment (major) appear to have the largest difference between current ODE funding weight and estimated cost-based funding weights. Currently, these students receive additional funding equivalent to twice the base funding, whereas our estimates suggest that implementation of best practices would require between seven and eight times the base funding.

Exhibit 15. Intended Annual Funding Levels Represented by the State Funding Formula Versus the Estimated Annual Per-Student Cost of Implementing Best Practices by Disability Classification

Traumatic brain injury
- $29,075
- $58,162
- $55,533

Autism — Category 6
- $29,075
- $39,556
- $36,595

Deafness-blindness
- $29,075
- $30,712
- $26,669

Orthopedic impairment
- $19,722
- $22,061
- $20,495

Multiple disabilities — Category 5
- $19,722
- $26,856
- $21,875

Other health impairment (major)
- $14,563
- $60,088
- $55,107

Visual impairment (blindness) — Category 4
- $14,563
- $32,246
- $30,961

Emotional disturbance
- $10,912
- $33,543
- $31,087

Hearing impairment (deafness) — Category 3
- $10,912
- $29,816
- $28,230

Intellectual disability
- $4,542
- $31,804
- $28,635

Developmental delay
- $4,542
- $31,199
- $29,694

Other health impairment (minor) — Category 2
- $4,542
- $16,791
- $15,313

Specific learning disability
- $4,542
- $11,227
- $10,029

Speech or language impairment — Category 1
- $1,790
- $9,914
- $9,131

Legend:
- ■ Intended funding
- ☐ Estimated per-student cost of implementing best practices
- ▨ Estimated per-student cost, adjusted for time in general education

Special Education in Ohio: Best Practices, Costs, and Policy Implications

Exhibit 16. Ohio's Special Education Funding Weights Versus Weights Based on the Average Per-Student Estimated Annual Cost of Implementing Best Practices by Disability Classification

Disability Classification	Ohio funding weight	Weight based on estimated cost of best practices	Weight based on adjusted estimated cost	Category
Traumatic brain injury	3.955	7.912	7.555	Category 6
Autism	3.955	5.381	4.978	Category 6
Deafness-blindness	3.955	4.178	3.628	Category 6
Orthopedic impairment	2.683	3.001	2.788	Category 5
Multiple disabilities	2.683	3.653	2.976	Category 5
Other health impairment (major)	1.981	8.174	7.497	Category 4
Visual impairment (blindness)	1.981	4.387	4.212	Category 4
Emotional disturbance	1.485	4.563	4.229	Category 3
Hearing impairment (deafness)	1.485	4.056	3.840	Category 3
Intellectual disability	0.618	4.327	3.896	Category 2
Developmental delay	0.618	4.244	4.040	Category 2
Other health impairment (minor)	0.618	2.284	2.083	Category 2
Specific learning disability	0.618	1.527	1.364	Category 2
Speech or language impairment	0.244	1.349	1.242	Category 1

Legend:
- Ohio funding weight
- Weight based on estimated cost of best practices
- Weight based on adjusted estimated cost

Exhibit 17 shows the cost-based funding weights for each disability classification, sorted in order of cost, along with the current funding category in brackets. The ordering of the cost-based weights highlights how the current ODE funding categories do not match the ordering suggested by the estimated costs of implementing best practices. To this end, services for some disability classifications would be vastly underfunded if best practices were implemented.

Exhibit 17. Weights Based on Estimated Costs of Implementing Best Practices by Disability Classification Arranged in Order of Increasing Cost

Weight based on estimated cost of best practices
Weight based on adjusted estimated cost

Special Education in Ohio: Best Practices, Costs, and Policy Implications
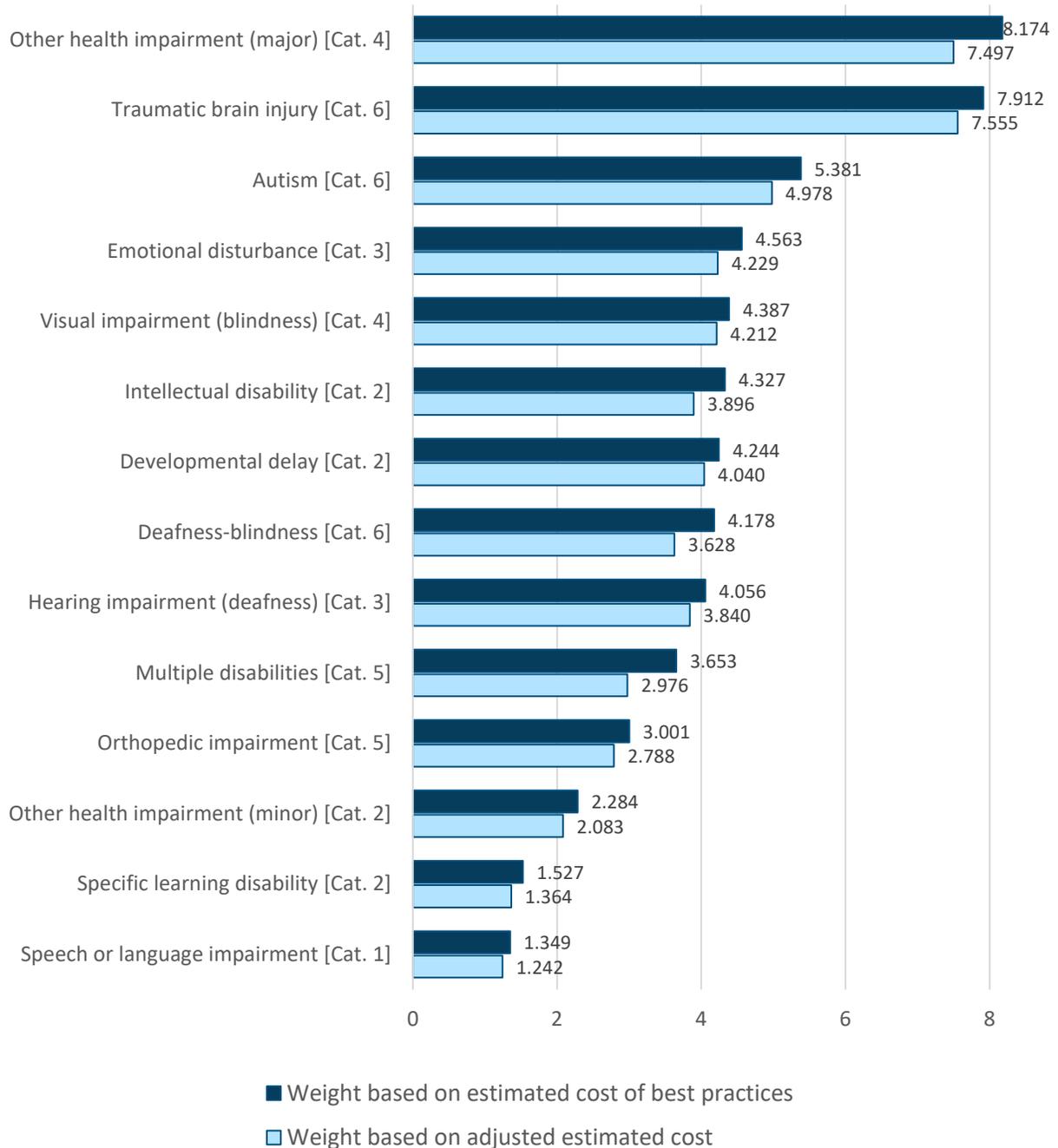
The exhibit also shows that changes vary greatly in the size of the weights associated with adjacent disability classifications. For instance, whereas the weight based on adjusted cost for TBI (7.555) is only 0.8% larger than for other health impairment (major) (7.497), the difference between other health impairment (major) and autism (4.978) is far larger at 50.6%. This mix of small and large differences in the size of the weights between neighboring disability classifications suggests there are natural clusters of disabilities that could be grouped into new funding categories. The new groupings would reduce the degree to which certain disability classifications within a given category are over- or underfunded.

State Funding for Students With Disabilities (RQ5)

This section includes the findings from our detailed policy review of state special education funding. Information about how other states fund special education can help ODE evaluate its funding formula and learn about other approaches that may align with their priorities and needs. In what follows we first describe Ohio's existing special education funding formula, then briefly summarize other states' formulas. Appendix D provides an overview of the formulas used by other states.

Ohio Special Education Funding

Ohio's special education funding formula uses a multiple-weight system that provides different levels of funding for different categories of students receiving special education services. (See Appendix D for description of the different types of formula states use to allocate aid to local education agencies [LEAs] for special education programs.) Students receiving special education services are assigned to six different categories based on their primary disability classification. (See Exhibit 12 for a list of categories and weights used for the 2021–22 school year.)

Ohio uses a foundation formula approach that generates a funding target for each district consisting of a base per-student amount and additional funding based on district need, including for students with disabilities, students who are economically disadvantaged, English learners, gifted students, and career and technical education. The amount of additional funding provided by the state for students receiving special education is based on a system of six weights, which correspond with different tiers of need that have been aggregated from different disability classifications. For each student who is eligible for special education, a weight (corresponding to their primary disability classification) is applied to the statewide average base cost per student to generate an additional amount of state funding intended to offset a portion of local special education expenditures. However, the actual amount received by a district is based on a "District State Share Percentage." This percentage varies across districts according to a measure of local capacity, which is calculated based on the districts' assessed valuation per student and income levels per student. For districts with higher local capacity, the state contributes a smaller share toward intended funding levels.

High-Cost Pools. Ohio operates a catastrophic aid program that provides a supplemental payment to eligible districts, joint vocational schools, and community schools for students receiving special education for extraordinary spending to educate a student with a disability in Categories 2–6 (i.e., all categories except speech or language impairment only). The state will provide reimbursement of at least 50% of the costs exceeding $27,375 for a child with a disability in Categories 2–5 or exceeding $32,850 for a child in Category 6 (ODE, 2022a). However, all payments are prorated for available state appropriations.[8] Education agencies are reimbursed for their prior academic year's documented expenses.

Summary of State Special Education Funding

All states provide some amount of additional funding to LEAs to help pay for the cost of special education services. Each state takes a somewhat unique approach to funding special education. For example, some states fund special education based on the actual number of students with disabilities whereas others base funding for special education on the count of all students or based on a fixed percentage of all students. Some states use a single funding amount for all students, and some use multiple funding amounts that differ based on disability classification. Despite certain differences, many states share common attributes with respect to (a) how the state contribution is determined and (b) the mechanisms used to distribute funding to localities.

State funding formulas for special education and related services are either built up from individual components or established from the top down using amounts appropriated in state budgets. States have operational differences regarding how their funding formula is developed and the mechanisms used to determine the amounts of funds that are generated by the formula. For example, some states use student count as a funding basis; that is, funds are determined by student weights or fixed-dollar amounts (per student). Other states operate on a resource ratio funding basis in which the state allots fixed-dollar grants. Contingency funding is a component of some states' funding policies and aims to fund the needs of students who may require intensive or unique supports that are in excess of the typical costs of special education services. States that have a contingency funding policy pay for a percentage of the additional costs above a set spending threshold with or without a cap on the total reimbursable amount. Some states go further by limiting the total funds available and prorate to a lesser amount if the demand for these funds exceeds the funding availability.

There is no "one best" approach to designing and implementing a state's special education funding formula. Rather, a state's formula should align with its goals for special education programs and practices, while recognizing that local educators view state special education

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[8] Ohio law generally requires that 10% of a district or school's special education funding from the state be set aside into a pool for catastrophic costs for students receiving special education.

Special Education in Ohio: Best Practices, Costs, and Policy Implications

funding with their own financial interests in mind. When designing a state special education funding formula, policymakers should consider (a) the cost of ensuring FAPE for students with disabilities; (b) the share of special education costs that will be paid for by the state; (c) the extent to which a state's aid calculation will account for differences in local wealth; (d) the motivational effects that underlie different bases and mechanisms in the funding formula; and (e) administrative efficiency. Appendix D provides a more detailed description of states' approaches to funding special education.

Developing Funding Policies that Support Implementation of Best Practices (RQ6)

The purpose of this study is to identify the best practices for serving students with disabilities and to estimate the costs of implementing those identified practices. Additionally, a review of state and federal policies around funding special education provide context regarding funding formulas. Together, this information can be used to inform policymaking around special education funding and program design in Ohio. This study highlights a need to update the existing funding to ensure appropriate and equitable funding for special education programs statewide.

Specifically, the evidence in this study leads to the following recommendations, which must be considered alongside the findings from other studies commissioned by Senate Bill 310.

Funding Formula Recommendations

A best practice for funding formulas overall is to review weights every 5 years to gather new information that informs funding formula updates and revisions. These periodic updates to the funding formula are not wholesale reform. Instead, a reevaluation cycle using cost-based evidence is a form of continuous improvement for funding formulas and helps the state respond to changing needs in the field.

The study findings illustrate several opportunities to revise existing policies to ensure that the state maintains a fair and efficient system for providing supplemental funding to local school districts for their special education programs: specifically, (a) revising the funding categories contained in the existing formula and (b) updating the weights to reflect contemporary costs and best practices.

1. **Revise the funding categories so they correspond to student disability and need.** The existing formula provides localities with different amounts of funding based on six categories of student need that are aligned with different IDEA disability classifications. Our empirical findings suggest that there is an opportunity to improve the alignment of the funding categories with the identified gradients of student need to effectively implement best practices. ODE could maintain its six funding category structure and regroup disability

classifications based on the estimated costs presented in this work. Another option is to simplify the funding model to have fewer funding categories. Alternatively, ODE could develop additional funding categories to better reflect the varying costs of implementing best practices for each disability classification.

2. **Recalibrate existing weights to reflect cost-based evidence.** The study team evaluated the weights incorporated in the state's current formula and found that existing weights do not accurately reflect the estimated cost of implementing best practices for special education and related services. The study findings provide evidence for potential new weights aligned with best practices and associated costs. Revising the weights will enable the state to maintain a fair and efficient system for providing supplemental funding to local school districts for their special education programs.

An additional consideration should be the impact of special education funding changes in the context of other potential changes to student funding formula (e.g., English learners). Funding simulations can model the overall impact on district funding allocations and will help ODE evaluate the equity implications of their funding decisions. Funding simulations are also a way to be transparent about funding decisions and help districts understand how funding changes will impact their annual funding.

Field-generated Recommendations

We leveraged the PJP approach to identify best practices for special education and related services and to estimate the associated costs. Additionally, the PJP discussions led to the following field-generated recommendations.

1. **Develop guidance and provide the resources necessary to include a multidisciplinary team in the identification, evaluation, and support of students with disabilities.** A key best practice that echoed across all components of special education and related services was the need for multidisciplinary teams to support the screening, identification, instruction, and reevaluation of students with disabilities. A multidisciplinary team requires staff trained in specialty areas and with time available to focus on student needs, which could result in decreased caseloads. Although not all schools have full-time staff across each discipline (e.g., educational audiologist, occupational therapist), it is important that the agencies responsible for ensuring students have access to these providers (e.g., educational service centers) have the capacity to allocate staff for a multidisciplinary team approach. State guidance and requirements around how to consistently use a multidisciplinary team would help ensure this best practice is implemented statewide, while adequate funding would support districts in recruiting and retaining adequate staff to implement this best practice.

2. **Increase the amount of professional development time that special educators and related service providers receive.** The need for increased and targeted professional development was emphasized in discussions about best practices and information gathered from interviews and surveys about the use of technology. When PJPs were asked to quantify the amount of professional development needed, they said a minimum of 3 additional days for special educators and related service providers is needed. Ohio districts have autonomy to determine what professional learning opportunities staff need; however, a state policy that mandates (and adequately funds) additional professional learning time for staff leading the IEP team (i.e., special educators) and those with specialized input in IEP services (i.e., related service providers) signals the state's commitment to special education and related services. In addition, districts should consider the professional learning needs of all staff (e.g., office staff, cafeteria personnel, district staff who often are in school buildings) who interact with students who have disabilities.

Study Limitations

The limitations presented in this section contextualize the findings and highlight areas where additional research may be beneficial for Ohio. Although rigorous methods were applied at all phases and components of this study, it is important to describe the associated limitations. The limitations are described in the context of the relevant study component.

Panelist Perceptions

Given the nature of the IEP process and mandates, panelists are accustomed to thinking about the unique and specific needs of individual students. An important part of the PJP process is to articulate the needs most typically seen across all students with disabilities. These two concepts were at odds with each other. In addition, the expert practitioner panelists are currently facing unprecedented staffing shortages and student needs brought on by the current labor market and lingering learning loss attributed to COVID-19-related school closures. Although it was important for facilitators to give space for panelists to describe their current circumstances, it also was critical for the panelists to think about what would be needed to implement best practices. Striking the balance between giving space for panelists to describe their current struggles and pushing them to consider the needs for best practices was a challenge.

Individualized Educational Programming Versus State Policies

Special education, by its nature, aims to meet the unique needs of individual students through a student-centered, team-based approach. However, in this study, the goal was to inform overall funding policy for students across Ohio. Although panelists described the extreme needs

Special Education in Ohio: Best Practices, Costs, and Policy Implications

of students (e.g., some students needing very few services infrequently and some needing intense and frequent services), we steered panelist discussions toward the most typical needs of the students they served. This thought exercise was difficult for our panelists because they are experts in thinking about each student's individual needs.

Cost Estimates

The per-student cost estimates presented in this report encompass what would be needed to implement best practices for the typical student within a disability classification. However, every student with a disability is unique, and their specific needs vary greatly, even within a primary disability classification (e.g., functional ability, having additional disabilities). This study intends to inform state policy about funding special education and the special education funding categories currently used. As such, the analysis required a focus on identifying resources needed by the "typical" student within each disability classification and their corresponding costs. Therefore, an inherent limitation of the estimates is their inability to express cost variation associated with differential student needs within each disability classification.

An additional limitation is that cost estimates should be considered lower-bound estimates because there are specific resources for which costs were not quantified. Specifically, the estimates do not include the costs of nonpersonnel resources, specific types of professional development, and transportation.

Special Education in Ohio: Best Practices, Costs, and Policy Implications

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Appendices

Appendix A. Professional Judgment Panel Process

A.1. Professional Judgment Goal Statement

Desired Goal. The work of the panel will be to identify the program design (evidence-based best practices) and resource specifications necessary to achieving the following goal: *Meet the needs of the whole child, which is an opportunity to ensure positive and meaningful educational experiences for students with disabilities that will lead to academic and postsecondary success.*

Strategic Plan. Panelists should ensure that the program design is consistent with the goal, learning domains, core principles, and priority strategies of the Ohio Strategic Plan, *Each Child, Our Future* (ODE, n.d.c). The strategic plan summarized in the following infographic:
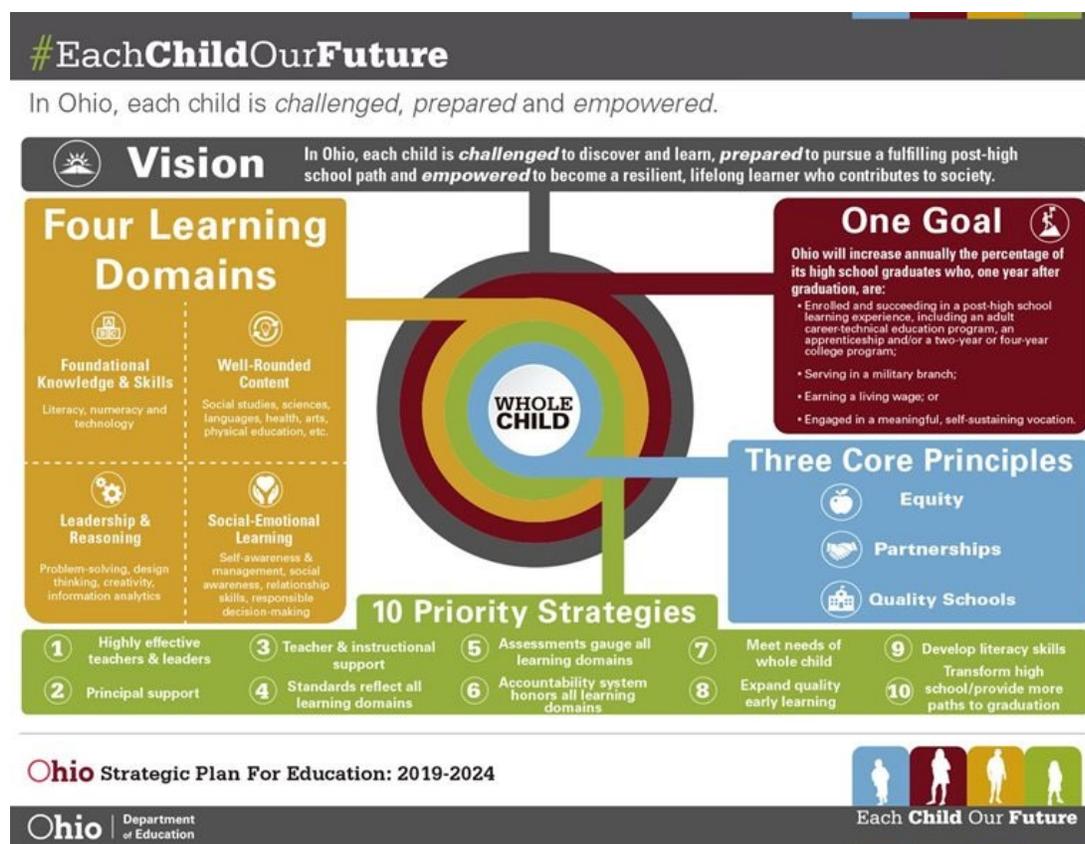
Ohio Operating Standards. Additionally, the expectations outlined in the *Ohio Operating Standards for the Education of Children with Disabilities* (ODE, n.d.d) shall serve as a guiding principle and be available as a resource to the panel to consult and observe as needed during

Special Education in Ohio: Best Practices, Costs, and Policy Implications

panel tasks and deliberations. These standards identify the state requirements and federal Part B IDEA requirements that apply to the implementation of special education and related services to students with disabilities by school districts, county boards of developmental disabilities, and other educational agencies. As indicated in ODE's Ohio Operating Standards (ODE, n.d.d), the foundational goal for the education of children with disabilities is to ensure that they receive a free, appropriate public education (FAPE). All program designs and resources that you specify must comply with these state and federal laws.

Ohio's System of General Supervision. *Ohio's System of General Supervision* (ODE, n.d.d) reflects the belief that all local education agencies should meet requirements and improve results for students with disabilities. The system has both state and local indicators.

A.2. Letter of Support From Ohio Department of Education

Dear Education Leader,

The American Institutes for Research® (AIR®) has partnered with the Ohio Department of Education to identify evidence-based best practices, as well as associated costs, for providing specially designed instruction and related services to students with disabilities. We are asking for your support of this study by recruiting educators, service providers, and parent mentors within your educational entity or those you partner with to serve on a research panel that will inform future state policy surrounding funding for students with disabilities.

Each panel will consist of up to 10 members from traditional public school districts and community schools, throughout the state, with each member representing a different area of expertise. All panelists will participate in a total of four, 2-hour virtual discussions and complete a short activity between each meeting. Once participants have been identified, the virtual meetings are anticipated to take place in May.

In the coming days, AIR will send an email with a study summary and email language (including a link to the application) that you can share with expert practitioners you feel would be best suited for this important work.

Participation is voluntary; however, it will give panelists the opportunity to directly collaborate with others from around the state and engage in important work that will inform special education funding policy and practice in Ohio for years to come.

If you have any questions, please reach out to Amanda Danks, project director for AIR, at adanks@air.org or 919-918-2321.

A.3. Professional Judgment Panel Application

AIR®

Ohio | Department of Education

PJP Application

The American Institutes for Research® (AIR®) is partnering with the Ohio Department of Education (ODE) to identify evidence-based best practices for providing specially designed instruction and related services to students with disabilities and their corresponding costs. This investigation will inform future state policy surrounding funding for students with disabilities. To accomplish this task, AIR is recruiting expert practitioners with extensive experience developing effective programming for students with disabilities to serve on professional judgment panels (PJPs), which will meet virtually to determine best practices. We are excited about your interest in participating in this process. Please complete this application so that we know more about your work with students with disabilities. This application is voluntary to be considered for selection as a panelist for this special education cost study. IMPORTANT: Please complete and submit your application by 05/31/2022. We will review your application and contact those that have been selected to serve on a panel by 06/01/2022. If you have any questions about the application or the study, please contact us at Ohio_Study@air.org or 919-918-2321.

1. First Name

2. Last Name

3. Email

4. With which school district are you primarily associated based on your professional role?

   (Please type to search)

5. Select the job title that most closely describes your current position in serving students with disabilities.

   (Select only one option)
   - Superintendent/Assistant Superintendent

   - Special Education Director/Coordinator

- Principal/Assistant Principal

- Intervention Specialist serving students with specific learning disabilities or other health impairment minor

- Related Service Provider (i.e., occupational therapists, physical therapists, speech-language pathologists, audiologists, school psychologists, counselors, social workers, behavioral specialists)

- Intervention Specialist serving students with sensory impairments (i.e., teachers of the visually impaired, teachers of the deaf, orientation and mobility specialists, assistive technology)

- General Education Teacher or Curriculum Specialist

- Paraprofessional/Educational Aide

- Outside Agency Partner/Provider (i.e., state schools, departments of developmental disabilities, vocational programs, rehabilitation programs, educational service centers)

- Parent Mentor

- Parent Training and Information Center staff (Ohio Coalition for the Education of Children with Disabilities)

6. Select the grade level(s) that best describes your current position.

   (Choose all that apply)
   - Early childhood

   - Elementary

   - Middle

   - Secondary

   - All students in the district

7. Select the range of years that best represents the number of years you have held your current position.

   (Select only one option)
   - 1–5 years

   - 6–10 years

   - 11–15 years

   - 16–20 years

   - Over 20 years

8. Select any additional positions held within the past 5 years in which you served students with disabilities.

    (Choose all that apply)
    - Superintendent/Assistant Superintendent

    - Special Education Director/Coordinator

    - Principal/Assistant Principal

    - Intervention Specialist serving students with specific learning disabilities or other health impairment minor

    - Related Service Provider (i.e., occupational therapists, physical therapists, speech-language pathologists, audiologists, school psychologists, counselors, social workers, behavioral specialists)

    - Intervention Specialist serving students with sensory impairments (i.e., teachers of the visually impaired, teachers of the deaf, orientation and mobility specialists, assistive technology)

    - General Education Teacher or Curriculum Specialist

    - Paraprofessional/Educational Aide

    - Outside Agency Partner/Provider (i.e., state schools, departments of developmental disabilities, vocational programs, rehabilitation programs, educational service centers)

    - Parent Mentor

    - Parent Training and Information Center staff (Ohio Coalition for the Education of Children with Disabilities)

    - N/A

9. What other district(s) have you worked at in the past 5 years?

    Press "select an option" and begin typing to find districts. Leave blank if N/A.

10. Select the range of years that best represents the total number of years you have worked in special education.

    (Select only one option)
    - 1–5 years

    - 6–10 years

    - 11–15 years

    - 16–20 years

    - Over 20 years

11. Please indicate your highest level of education completed.

    (Select only one option)

    - High school diploma

    - Associate degree

    - Bachelor's degree

    - Master's degree

    - Doctoral degree

12. To identify best practices and associated costs, we are creating two sets of professional judgment panels (PJPs). One set of PJPs will focus on services for students with low-incidence disabilities, which in this study are defined as those students who are receiving instruction in the Ohio Learning Standards—Extended and taking the Ohio alternative assessment. The other set of PJPs will focus on students with high-incidence disabilities, which in this study are defined as those students with disabilities who are receiving instruction Ohio's Learning Standards.

    Which panel focus best matches your expertise?

    (You may select both if your expertise equally matches both types.)

    - Panel for students with low-incidence disabilities

    - Panel students with high-incidence disabilities

13. Please tell us briefly why you are interested in serving as a panelist. Share any relevant professional awards or recognition and any examples of success working with students with disabilities that you would like considered.

    (Up to 200 words.)

14. As we recruit panelists from across the state, we want to be sure we are considering the variety of lived experiences that impact how students with disabilities are served. Please tell us about yourself as we aim for diverse representation on the professional judgment panels.

    Are you Hispanic or Latino?

    - Yes

    - No

15. What is your race?

    Select all that apply:

    - American Indian or Alaska Native

    - Asian

- Black or African American

- Native Hawaiian or Other Pacific Islander

- White

16. Are there any accessibility supports (translator, technology, etc.) you will need to actively participate in the PJPs?

    Note that this will not impact selection into the panel, but instead it will help us plan the panel discussions so that everyone can engage fully.
    - Yes

    - No

17. Which of these series of dates are you available from 4–6 p.m. EST?

    (Select all that apply)
    - Tuesdays: June 7, 14, 28; July 12

    - Wednesdays: June 8, 15, 29; July 13

    - Thursdays: June 9, 16, 30; July 14

Should you be selected to participate in a panel, please note that participation on the panel is voluntary and uncompensated. There are no foreseeable risks of your involvement in this study as we seek to understand what resources are needed to produce appropriate outcomes for students with disabilities. Your name and position will not be associated with any particular statement to ODE or in our report; however, your name, position, and location will be listed in a report appendix to describe the PJP participants generally.

A.4. Professional Judgment Panel Recruitment Email

Subject: Encourage Staff to Apply for the Special Education Professional Judgment Panels

Dear Educational Leader,

The American Institutes for Research® (AIR®) has partnered with the Ohio Department of Education (ODE) to identify the best practices, and associated costs, of providing special education and related services to students with disabilities in Ohio. To accomplish this task, AIR is recruiting expert practitioners who are exceptionally familiar with educational programs for students with disabilities that are known to produce positive outcomes to serve on professional judgment panels (PJPs).

ODE is hoping for your support in recruiting PJP applicants by simply forwarding this email (or using the text below, if you prefer), which includes the application link: https://airtable.com/shrqd7kCwWNgo8d0b, to staff members you feel are exceptionally capable of contributing to a discussion about best practices for providing special education and related services to students with disabilities. **The application is due on Friday, May 20th.** The goal is to have individuals from each of the following categories, so please forward this email to as many expert practitioners as you see fit.

Targeted Positions

- Superintendent/General District Leader;
- Special Education Director/Special Services Leader;
- Principal/Assistant Principal;
- Special Education Teacher;
- Related Service Provider (i.e., occupational therapists, physical therapists, school psychologists, counselors, social workers, behavioral specialists);
- Sensory Impairment Specialist (i.e., teachers of the visually impaired, teachers of the deaf, orientation and mobility specialists, audiologists);
- Other Specialist (i.e., Assistive Technology, Behavior; Instruction);
- General Education Teacher;
- Paraeducator/Educational Aide; and
- Outside Agency Partner/Provider (i.e., personnel from other agencies that work with your district. These may include state schools, departments of developmental disabilities, vocational programs, rehabilitation programs, educational service centers).

If you have any questions or need additional information, please contact Amanda Danks (Ohio_Study@air.org or 919-918-2321).

Thank you for your support in this recruitment process.

Amanda Danks
Senior Researcher, AIR

Email to Expert Practitioners

Dear Expert Practitioner,

I encourage you to apply to participate in an exciting voluntary study to understand the best practices, and associated costs, of providing special education and related services to students with disabilities in Ohio.

To understand best practices and the associated costs, the American Institutes for Research® (AIR®) is recruiting expert practitioners like you, who are exceptionally familiar with educational programs for students with disabilities, to serve on professional judgment panels (PJPs). This voluntary opportunity is a way to potentially inform statewide policy around serving students with disabilities. Your experience and expertise make you exceptionally well suited for participation, and I hope you will consider applying. Please complete this application: https://airtable.com/shrqd7kCwWNgo8d0b, if you are interested in participating. If you have any questions about the study or need additional information, please contact Amanda Danks (Ohio_Study@air.org or 919-918-2321). **The application is due on Friday, May 20th.**

Thank you for your dedication to the children of Ohio!

A.5. PJP Reminder Email

Subject: Reminder: Please encourage your staff to apply to the ODE PJPs

Dear Fellow Educator,

As a reminder, the American Institutes for Research® (AIR®) has partnered with the Ohio Department of Education (ODE) to identify evidence-based best practices and associated costs of providing specially designed instruction and related services to students with disabilities in Ohio. To accomplish this task, AIR is recruiting expert practitioners with extensive experience developing effective programming for students with disabilities to serve on professional judgment panels (PJPs).

ODE is asking for your continued support in recruiting candidates to participate in the PJP process. Please forward this email (or use the text below), which includes the application link https://airtable.com/shrqd7kCwWNgo8d0b, to staff members you feel are best suited for contributing to a discussion about evidence-based practices for providing specially designed instruction and related services to students with disabilities. AIR is especially interested in candidates with demonstrated success at improving the outcomes of students with disabilities through the development and/or delivery of effective programming.

The goal is to recruit individuals from each of the following categories, so please forward this email to as many expert practitioners as you see fit. **The application is due on Friday, May 31st.**

Targeted Positions

- Superintendent/General District Leader;

- Special Education Director/Special Services Leader;

- Principal/Assistant Principal;

- Special Education Teacher;

- Related Service Provider (i.e., occupational therapists, physical therapists, school psychologists, counselors, social workers, behavioral specialists);

- Sensory Impairment Specialist (i.e., teachers of the visually impaired, teachers of the deaf, orientation and mobility specialists, audiologists);

- Other Specialist (i.e., Assistive Technology, Behavior; Instruction);

- General Education Teacher;

- Paraeducator/Educational Aide; and

- Outside Agency Partner/Provider (i.e., Personnel from other agencies that work with your district. These may include state schools, departments of developmental disabilities, vocational programs, rehabilitation programs, educational service centers).

Please encourage staff you deem appropriate for this expert practitioner panel to apply. If you have any questions or need additional information, please contact Amanda Danks (Ohio_Study@air.org or 919-918-2321).

Thank you for your support in this recruitment process.

Have a great day,

Amanda Danks
Senior Researcher, AIR

Email to Expert Practitioners

Dear Expert Practitioner,

I strongly encourage you to apply to represent your educational entity and share your expertise in an exciting voluntary study to understand evidence-based best practices for providing special education and related services to students with disabilities.

To understand these practices, the American Institutes for Research® (AIR®) is recruiting expert practitioners like you to serve on professional judgment panels (PJPs). This voluntary opportunity is a way to inform statewide policy around serving students with disabilities. Your familiarity with educational practices for students with disabilities makes you exceptionally well suited for participation, and I strongly encourage you to apply here https://airtable.com/shrqd7kCwWNgo8d0b. This is a great opportunity for you to contribute your expertise to a study that will inform special education funding in Ohio. If you have any questions about the study or need additional information, please contact Amanda Danks (Ohio_Study@air.org or 919-918-2321). **The application is due on Friday, May 31st.**

Thank you for your dedication to the children of Ohio!

A.6. Beating-the-Odds Analysis

A beating-the-odds (BTO) analysis was conducted to help identify districts where students with disabilities are performing better than expected, based on observable characteristics. It is assumed that evidence-based best practices are being implemented in these districts and, therefore, that staff working in these districts have a high likelihood of implementing best practices. Information from the BTO was used as a piece of evidence when selecting PJP participants. This section describes the data used for the BTO analysis along with a summary of findings.

Data

Data for the BTO analysis came from:

- Ohio report card data for traditional school districts and community schools (found here: Ohio School Report Cards);
- special education performance indicator data;
- district and school enrollment data;
- special education enrollment by special education funding data; and
- urbanicity data from the National Center for Education Statistics (NCES) Common Core of Data (NCES, n.d.a).

We used data from the 2016–17 through 2018–19 school years, which were the most recent years with complete data for all variables included in the analysis.

The data used can be categorized as either outcome measures or district or school characteristics. The outcome measures included in the analysis are the percentage of special education indicators (of a possible 27) met by each district or community school, as well as reading and math performance, attendance rates, graduation rates (4- and 5-year), and value-added for students with disabilities in a given district or community school.

The measures of district or school characteristics include the overall size based on enrollment; the percentage of students who have disabilities; the percentage of students with disability qualifying for each special education funding category; the percentage of total enrollment by race; the percentage of students who are female; the percentage of enrollment by grade level (elementary, middle, or high); the special education support region where the district or school is located; whether the district or school is in an urban, suburban, town, or rural area; and whether the district or school is a traditional district or community school.

In addition to restricting the analysis to the 3 school years indicated above, we restricted the analysis to districts and community schools with at least 20 students with disabilities, a total enrollment of at least 150, and at least five of the 27 special education indicators on which they

were evaluated. After applying these restrictions, we then included only districts and schools that were present in the data for all 3 school years. These restrictions resulted in an analysis sample of 607 traditional school districts and 146 community schools per year—2,259 observations in total across all 3 years.[9]

Analysis

From the set of identified outcome measures, we generated a single scale score intended to indicate the overall level of school effectiveness in meeting the needs of students with disabilities. To do so, we used a data reduction procedure known as "factor analysis," which extracts maximum common variance from all outcome measures considered to construct a score. Exhibit A.6.1 shows the correlations among the various outcome measures and the outcome factor scores. As shown, the outcome factor school is moderately to strongly correlated with each outcome measure.[10]

Exhibit A.6.1. Correlations Between Outcome Variables

	Outcome factor score	Reading perf.	Math perf.	Attend.	Grad. (4-year)	Grad. (5-year)	Value-added	Ind. met
Outcome factor	1.00							
Reading perf.	0.31	1.00						
Math perf.	0.33	0.94	1.00					
Attendance	0.21	0.18	0.18	1.00				
Grad. (4-year)	0.75	0.14	0.14	0.09	1.00			
Grad. (5-year)	0.63	0.14	0.15	0.08	0.52	1.00		
Value-added	0.22	0.01	0.07	−0.03	0.08	0.09	1.00	
Indicators met	0.88	0.16	0.17	0.10	0.43	0.35	0.13	1.00

Note. Correlations are weighted by special education enrollment. Attend. = attendance; Grad. = graduation rate; Ind. = indicators; Perf. = performance.

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[9] After applying restrictions, 584 community school observations and nine traditional district observations were dropped. Of the dropped observations, 77% were in areas defined as cities, 15% were in suburbs, 5% were in towns, and 3% were rural. When applied sequentially, 319 observations were dropped due to low enrollment of students with disabilities, 158 were dropped due to low overall enrollment, 18 were dropped due to a low number of indicators, and 98 were dropped as a result of not being present in the data for 3 years. Of the observations dropped, the median number of students with disabilities enrolled was 19.

[10] As additional evidence of the reliability of the outcome factor score, the correlation between the outcome factor score and the 1-year lagged outcome factor score is 0.64. In addition, a model with the outcome factor score as the outcome variable and district fixed effects as the only predictors produces an R^2 of 0.74.

The resulting outcome factor score, when weighted by each district or school's special education enrollment, has a mean of 0 and a standard deviation of approximately 0.8. Exhibit A.6.2 shows the distribution of the outcome factor score, showing that it has a range of slightly less than –2 to almost 2. Most commonly, the set of districts and community schools included in the analysis have an outcome factor score of approximately 0.5.

Exhibit A.6.2. Distribution of the Outcome Factor Score

Outcome factor score
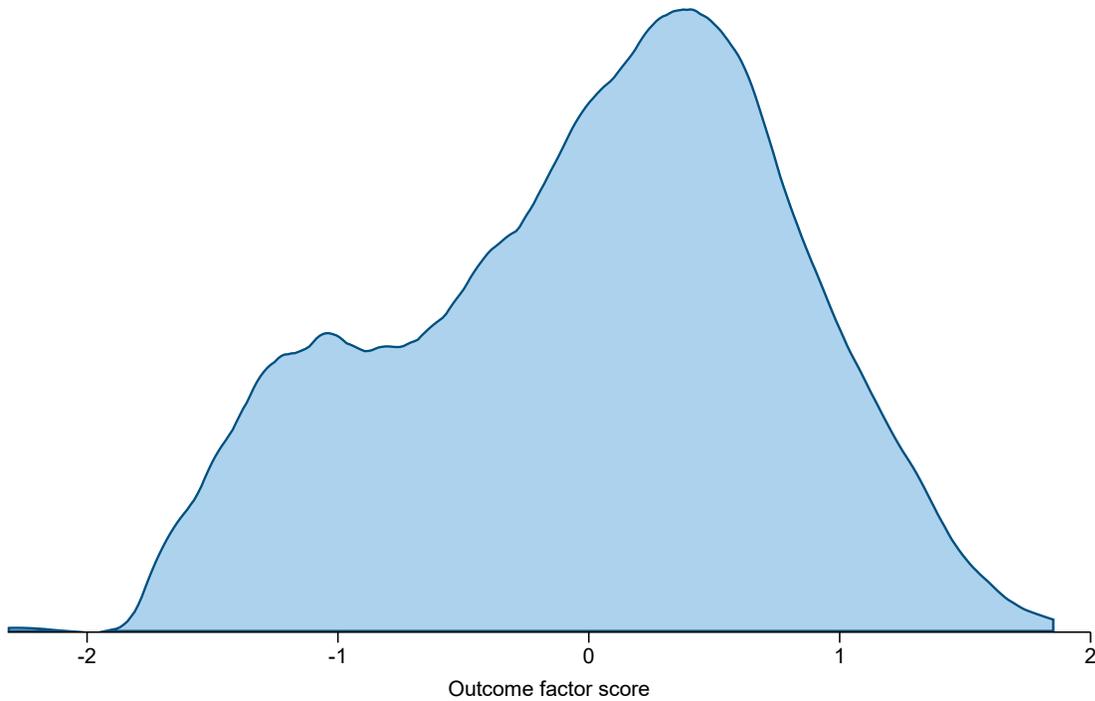
After generating the outcome scores, we ran a regression model using the outcome factor score as the outcome with district and school characteristics as control variables. The regression model used can be described as follows:

$$SpecEdOutcome_{s,y}$$

$$= \alpha + \beta_1 TotEnroll_{s,y} + \beta_2 SWD_{s,y} + \sum_{d=2}^{6} \beta_{3d}\, DisabilityCat_{s,y}$$

$$+ \beta_4 EconDis_{s,y} + \sum_{r=1}^{4} \beta_{5r}\, RaceCat_{s,y} + \beta_6 CommSchool_{s,y}$$

$$+ \sum_{g=1}^{2} \beta_{7g}\, GradeShare_{s,y} + \sum_{u=1}^{3} \beta_{8u}\, Urban_{s,y} + \sum_{q=2}^{16} \beta_{9q}\, Region_{s,y}$$

$$+ \sum_{y=1}^{2} \beta_{10y} Year_y + \varepsilon_{s,y}$$

where

SpecEdOutcome = Special education factor score as described above for a given district or community school in a given year.

TotEnroll = The natural log of total district or community school enrollment.

SWD = Students with disabilities as a percentage of total enrollment.

DisabilityCat = Students with a particular disability category based on the six special education funding categories as a percentage of students with disabilities enrollment.

EconDis = Students who are economically disadvantaged as a percentage of total enrollment.

RaceCat = Students by race category (Black, White, Hispanic, Multiracial) as a percentage of total enrollment (all other race categories are the reference group).

CommSchool = An indicator for community schools (as opposed to traditional school districts).

GradeShare = Shares of student enrollment in elementary (grades PreK–5) or middle grades (6–8).

Locale = Indicators of whether the school is in a suburban, town, or rural area (districts/community schools in urban areas serve as the reference group).

Region = Indicators of in which region the school resides.

Year = Indicators of the 2017–18 and 2018–19 school years (the 2016–17 year serves as the reference group).

ε = A random error term assumed to be uncorrelated across districts but may be correlated within districts.

Using the specified model, we estimated the residual (the difference between actual outcome and predicted outcome) for each district and community school and standardized the residuals to have a mean of 0 and a standard deviation of 1. Because each district or school was in the data set for 3 years, we then calculated the average residual across all years for each traditional district or community school.

By controlling for characteristics that affect outcomes, but are arguably outside of each district's or school's control, the residual can be thought of as how much each district or school is "beating the odds" based on the their specific context. Of course, other variables outside the district's control that we did not include could affect outcomes. Student needs and socioeconomic situations are far more nuanced than can be perfectly represented by the data available. Therefore, the beating the odds scores are intended only to approximate districts' effectiveness and have not been used for any high-stakes decisions.[11]

Results

Exhibit A.6.3 displays the regression results for the BTO model. As seen in the results, certain district characteristics are predictive of the outcome factor score. For example, districts with higher percentages of students who are Black and economically disadvantaged typically have lower outcomes for students receiving special education services. By controlling for these factors, the BTO residual (or score) accounts for differences in outcomes related to the characteristics controlled for. Therefore, it represents the performance of districts relative to districts with similar characteristics.

Exhibit A.6.4 displays the distribution of residuals reflecting the extent to which districts or community schools are "beating the odds"—termed the *beating-the-odds score* or *BTO score*. As this exhibit shows, the BTO scores range from approximately –4 to 3, with a peak density around 0. A value of 0 for the BTO score represents average outcomes for students with disabilities. Positive BTO values represent better than average outcomes, and negative BTO values represent worse than average outcomes for students with disabilities.

Last, Exhibit A.6.5 shows average district characteristics across districts grouped into quintiles based on the BTO score. Quintile 1 represents the districts with the lowest BTO scores, and quintile 5 represents the districts with the highest BTO scores. For the students with disabilities outcome variables, the districts with the highest BTO scores clearly have the highest student outcomes, on average, as would be expected. However, for other characteristics, such as student demographics, no clear patterns distinguish districts across quintiles. Thus, the regression analysis accomplished what it was intended to do. The differences in outcomes across BTO quintiles are due to differences in outcomes for students with disabilities but not due to other district characteristics, which may also be associated with outcomes for students with disabilities.

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[11] To ensure the reliability of the estimated BTO scores, we randomly selected half of the districts and charter schools in the sample, reestimated the regression model, and generated a new BTO score based on the random half. We than calculated the correlation between the original BTO score and the random half BTO score. Repeating this procedure 100 times, the average correlation between the original BTO score and random half BTO scores was 0.94.

Special Education in Ohio: Best Practices, Costs, and Policy Implications

Exhibit A.6.3. Regression Results Predicting the Outcome Factor Score

District characteristics	Regression coefficient
SWD enrollment proportion	−0.520 (0.524)
SWD funding category 2 proportion	0.679 (0.534)
SWD funding category 3 proportion	−2.310** (0.839)
SWD funding category 4 proportion	1.031 (2.775)
SWD funding category 5 proportion	1.861 (1.167)
SWD funding category 6 proportion	−0.0994 (0.745)
Black enrollment proportion	−2.620** (0.964)
White enrollment proportion	−1.783 (0.935)
Multiracial enrollment proportion	−3.437** (1.263)
Hispanic enrollment proportion	−1.936 (1.024)
Economically disadvantaged enrollment proportion	−0.752*** (0.149)
Female enrollment proportion	−0.121 (1.011)
Grade K–5 enrollment proportion	0.815** (0.252)
Grade 6–8 enrollment proportion	0.427 (0.294)
Total enrollment (ln)	−0.198*** (0.0466)
Suburb	0.0988 (0.116)
Town	−0.113 (0.126)
Rural	−0.0459 (0.144)
Community school	0.231 (0.210)
Constant	3.233* (1.355)
N	2,259
R^2	0.594

Note. Standard errors are in parentheses. Regression is weighted by enrollment of students with disabilities.

*$p < .05$. **$p < .01$. ***$p < .001$.

Special Education in Ohio: Best Practices, Costs, and Policy Implications

Exhibit A.6.4. Distribution of Beating the Odds Score

Beating the odds score

Special Education in Ohio: Best Practices, Costs, and Policy Implications
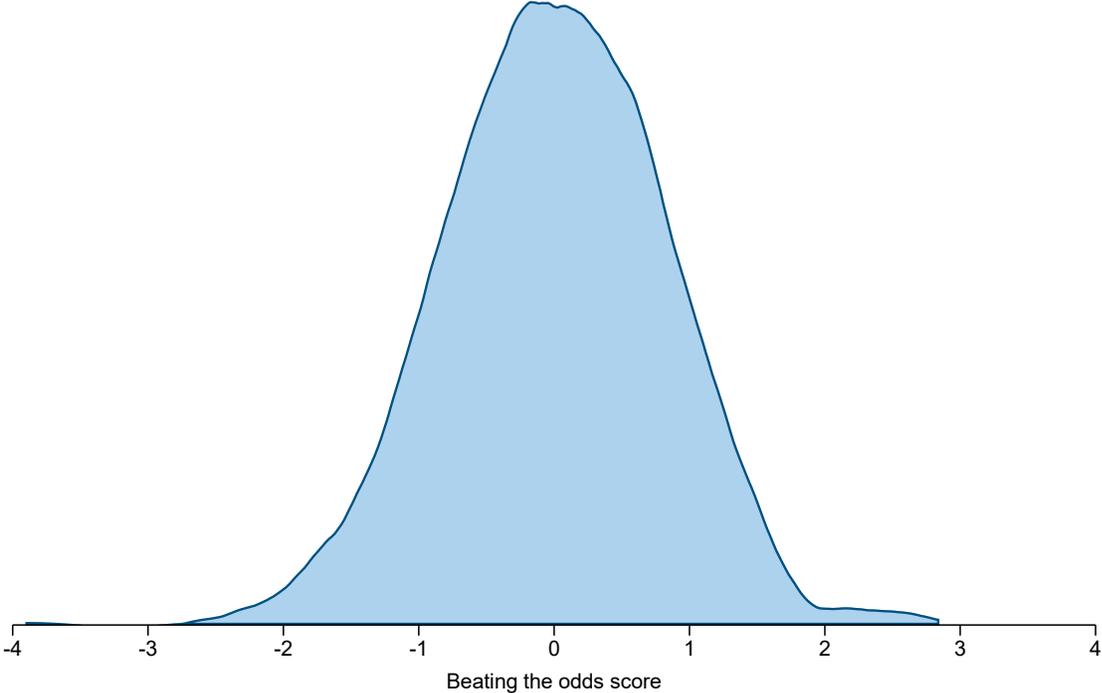
Exhibit A.6.5. Characteristics of School Districts by Beating the Odds Score Quintile

	Variable	Beating the odds quintile				
		1 Lowest performing	2	3	4	5 Highest performing
SWD outcomes	Beating the odds score	−1.11	−0.39	−0.02	0.45	1.12
	Outcome factor score	−0.57	−0.46	−0.02	0.12	0.62
	Percentage of indicators met	−0.95	−1.40	−0.52	−0.48	0.42
	Reading performance	−0.13	−0.09	0.03	0.07	0.42
	Math performance	−0.17	−0.05	−0.04	0.08	0.46
	4-year graduation rate	−1.08	−0.64	−0.26	−0.14	0.32
	5-year graduation rate	−1.20	−0.41	−0.22	0.13	0.35
	Attendance rate	0.17	0.06	−0.32	0.12	−0.01
District characteristics	SWD value-added	−0.53	−0.13	0.09	0.08	0.14
	SWD enrollment %	15%	16%	16%	16%	15%
	Black enrollment %	13%	24%	16%	22%	13%
	White enrollment %	75%	60%	69%	62%	74%
	Multiracial enrollment %	5%	6%	6%	5%	5%
	Hispanic enrollment %	5%	7%	6%	8%	4%
	Economically disadvantaged enrollment %	48%	59%	49%	54%	50%
	Female enrollment %	49%	49%	48%	48%	49%
	SWD funding category 1 %	12%	11%	11%	11%	12%
	SWD funding category 2 %	67%	66%	66%	66%	66%
	SWD funding category 3 %	6%	8%	7%	7%	6%
	SWD funding category 4 %	1%	1%	0%	1%	1%
	SWD funding category 5 %	5%	5%	5%	5%	5%
	SWD funding category 6 %	10%	10%	12%	10%	10%
	Grade K–5 enrollment %	41%	44%	42%	43%	43%
	Grade 6–8 enrollment %	25%	24%	25%	24%	25%
	Grade 9–12 enrollment %	34%	31%	32%	33%	32%

Note. SWD is students with disabilities.

A.7. Professional Judgment Panelist Biographies

The following biographical summaries of the panelists illustrate the expertise included in this work.

Disability Group 2 Panelists

Quadrant 1

Bauer Morrow, Frances. Frances is a retired educator who worked for more than 35 years in education, including 28 years as a director of special education in the Bexley City Schools district. Frances's career spanned three different school districts, for which Frances oversaw all aspects of special education and transition from prekindergarten through age 22. Frances also served on the governing board of the Ohio Coalition for the Education of Children with Disabilities.

Hibbit, Jennifer. Jennifer has more than 20 years of experience as an intervention specialist. Jennifer worked in two separate school districts and has ideas on how to do more equitable testing for students with disabilities.

Lawton, Kathy. Kathy is a school administrator and is deeply invested in evidence-based practices for students with disabilities. In a career that has spanned more than 20 years, Kathy learned to analyze school finances and aims to collaborate with the state on the financial supports needed for students with disabilities to thrive.

Lenzo, Jamie. Jamie works as a special education director and supports students at The Graham School. Jamie also worked as a member of the Each Child, Our Future focus group that was created to address the disproportionality of students in special education in Ohio. Jamie is committed to always pursuing best practices to support all students, but especially students with disabilities.

McCance, Donna. Donna has worked in special education for more than 20 years as a district leader, during which she grew her passion for collaboration regarding evidence-based practices for students with disabilities. Donna works to ensure students with disabilities are integrated into classrooms with their peers in Lancaster City School District.

Murphy, Ryan. Ryan is a special education director and previously worked as an intervention specialist for more than 5 years. Ryan is committed to supporting special education policy across the state of Ohio and has served on many working groups that aim to set rigorous special education targets and goals.

Nelson, Michalene. Michalene brings more than 20 years of experience in special education, including working in suburban and urban districts in northwest and central Ohio. Michalene works to ensure that every student with a disability is viewed as a whole child with uniqueness.

Piskula, Holly. Holly has worked with students with disabilities for more than 20 years and has a passion for working in this field. Holly strives to make education opportunities equitable for all students and brings this perspective to the current role of special education coordinator.

Reynolds, Dahni. Dahni is a Board-Certified Behavior Analyst and works within the district's multitiered behavior interventions. Dahni works in the Mansfield City School District, explicitly with students with disabilities and is honored to serve in roles to enable policy changes.

Robinson, Elaine. Elaine is a special education coordinator and is frequently involved with career and technical education, which serves a high population of students with disabilities. Elaine facilitates extensive training for educators related to the use of technology to support students with disabilities.

Spinosi, Belinda. Belinda works as a parent mentor and assists state leaders in developing funding policy for appropriate education of students with disabilities. Belinda is a proud Columbus City Schools and Ohio State University graduate and was previously the executive director for a center for independent living in Ohio.

Quadrant 2

Brenneman, Jane. Jane has worked in special education for more than 30 years, including with adults in shelters, as a case manager, in a residential facility, and direction with students at the school level. Jane has seen the growth and changes in the support for individuals with disabilities over time and brings expertise on the best practices for supporting individuals in many areas of life.

Cooper-Foley, Mary. Mary brings 27 years of experience in education and has been a school board member for Perry Local School District in Lake County since 2016. Mary uses her experience to be involved in problem solving and thinking creatively to achieve common academic outcomes, supporting collaboration among peers.

Correthers, Carol. Carol is an intervention specialist who brings more than 20 years of experience and works with students with disabilities so that they have access to various educational supports to reach their highest potential. Carol works to share best practices with fellow intervention specialists across the state to have more tools to support students.

Frederick, Amy. Amy is currently a special education director and was an intervention specialist for more than 10 years. Amy is passionate about the field of special education and meeting students' needs through evidence-based best practices.

Hall, Kathy. Kathy wears multiple hats—special education director, school psychologist, and preschool coordinator—in a rural school district in Ohio. Kathy is a certified teacher evaluator under the Ohio State Board of Education and worked for 7 years on the State Advisory Panel for Exceptional Children.

Lowry, Shelley. Shelley is a special education director who oversees the full continuum of services from developmental disability providers, Head Start, and community providers for placement of student services. Shelley also worked on collaborative efforts with other school districts and state mandates regarding integrated preschool models.

Matthews-Babech, Mary. Mary has 30 years of teaching experience and 6 years as an administrator. Mary held the role of director of pupil services in the district and mentored new teachers and co-taught with general education teachers to meet the needs of students with disabilities.

McCool Berry, Mary. Mary is a retired special educator who taught in the Lakewood City Schools district for 32 years. Mary was awarded Northern Ohio's Outstanding Special Educator of the Year in 2015 and is also a Wilson Certified Practitioner, working toward being a language dyslexia therapist.

Peterson, Phyllis. Phyllis has been a special education teacher for more than 20 years in Cleveland Municipal School District and is interested in creating plans of actions that school districts and education support centers can follow to educate students with special needs.

Steinbach, Johnathan. Johnathan has been working as a licensed educator in Ohio since 1992. Johnathan worked with people with disabilities since childhood and has been an advocate for students and schools for years. Johnathan continues to fight for adequate services for both schools and students with disabilities.

Ticherich, Colleen. Colleen works with students who are deaf and is working toward a master of arts degree in this field to continue to support these students. Colleen worked on many initiatives at the local, state, and national levels and hopes to continue to support those initiatives and the deaf and hard-of-hearing community.

Watson, Meghan. Meghan is a special education director and was an instructional coach and intervention specialist in inner city schools in Ohio. Meghan has a diverse knowledge base of best practices in multitiered systems of supports and response to intervention.

Quadrant 3

Chamberlin (Waugh), Jamie. Jamie has been an intervention specialist for more than 15 years and has extensive experience in working with students with significant disabilities. Jamie has substantial experience with testing for students with disabilities and engaging with children comprehensively to assess which strategies best meet their needs.

DiAndreth-Elkins, Leann. Leanne is the executive director of disability resources and an associate professor of education at Muskingum University. Leanne has worked with college students with disabilities and academia for more than 20 years, taught in fourth- and fifth-grade inclusion classrooms, and was a co-teacher and coach for middle school teachers' development of effective strategies in inclusion classrooms.

Mackall, Janet. Janet has worked with students with disabilities for more than 20 years as an intervention specialist, adjunct professor, and director of special education. Janet has significant experience in individualized education program planning, transition services, and instruction.

O'Connor, Heather. Heather has worked in special education for 28 years as a teacher for students with multiple disabilities and as an inclusion teacher. As a principal for a preschool for students with disabilities, Heather was awarded as an Outstanding Educator in 2015 and served as a director of special services.

Parmer, Terry. Terry is an intervention specialist and was a special education teacher for more than 20 years. Terry has worked in many school districts with students from kindergarten through 12th grade and has a master's degree in education.

Sebastian, Tammie. Tammie has been a parent training and information staff member in the state of Ohio since 2011. Tammie sits on the State Advisory Panel for Exceptional Children as the vice chair and has served on many committees to support systemic solutions for students with disabilities.

Stuckney, Heidi. Heidi is a special education director and has worked in multiple school districts in the state of Ohio for more than 30 years. Heidi worked to revamp and support the achievement and growth outcomes for students with disabilities.

Supanik, Cheryl. Cheryl is a special education director in Bellmont Harrison Vocational school district and formerly worked as an intervention specialist. Cheryl has been recognized by a former district for outstanding work and wrote grants to support special education funding. Cheryl works to support the importance of time and effort put toward students with disabilities by fellow service providers.

Wilson, Miranda. Miranda is a national certified school psychologist and is currently working toward a doctorate in community care and counseling/traumatology. Miranda serves on the Ohio School Psychologists Association executive board and continues to support special education practices in Ohio.

Quadrant 4

Belfrom, Misty. Misty is a building administrator with a background in special education and curriculum and instruction. As the coordinator of special education for the district, Misty oversees testing for all students with disabilities and the multitiered system of supports.

Berning, Michele. Michele has supported school districts through best practices and evidence programing for more than 20 years through work with students experiencing mental health issues. Michele completed a certificate in applied education neuroscience and is interested in continuing to support the use of brain science in supports and services for students with disabilities.

Harris, Marietta. Marietta has been a special educator for more than 20 years and worked in many different districts and school systems. Marietta's career started in school psychology but also has included roles as special education director; supervisor; and coordinator, writing functional behavior assessments for K–12 students.

McFarland, James. James has been the director of student services for the past 5 years and has extensive knowledge in finances associated with providing support for students with disabilities. James heads a department of more than 75 individuals who support funding models for students with disabilities from prekindergarten through age 23.

Roper, Lynn. Lynn was an intervention specialist for 14 years in middle school and has worked in higher education for the past 17 years to prepare future educators for their work with students who have disabilities. Lynn strives in all her work to support students with disabilities.

Sebastian, Laura. Laura is an intervention specialist who has been working with students with disabilities for more than 10 years. Laura has participated on the Ohio Council for Exceptional Children, Intervention Specialist Curriculum Council, and the Hamilton County Family and Children First Committee.

Wood, Chevonne. Chevonne has worked with students with disabilities for 11 years and is currently the lead intervention specialist at the school level. Chevonne was nominated for teacher of year and uses her experience to show that students with disabilities need more people to advocate on their behalf and support them in educational spaces.

Disability Group 2 Panelists

Quadrants 1 and 2

Bernhard, Tracey. Tracy is an individual provider for the Pickaway County Board of Developmental Disabilities. Tracy has a master's degree in special education and another in educational administration. Tracy has served in many roles during the years, including special educator, coordinator and transition specialist, and regional consultant for Ohio's state support teams.

Bonk, Ellen. Ellen has 35 years of experience in speech and language pathology and earned a master's degree in speech language pathology. Ellen is currently a supervisor in the speech and language services department of Columbus City Schools district supervising 80 therapists who work in school settings and previously was a clinical supervisor at The Ohio State University.

Fulton, Julie. Julie currently works as a special education director in the Ashtabula Area City Schools district and was previously a school administrator.

Gunnoe, Andrea. Andrea currently serves as a school psychologist and has 22 years of experience in this role. Andrea is a related service provider in the Hilliard City Schools district and is a parent of a student with significant disabilities.

Koebele, Santana. Santana is a school psychologist and has worked in three different states and in multiple districts in Ohio. Santana currently works in the Mount Gilead School District and has worked in the preschool setting, in general education classrooms, and with students who have low-incidence disabilities.

Lish-Brown, Thomas. Thomas serves as a special education director in North Union Local School District. Thomas strives to impact as many students with disabilities as possible and mentor teachers so that they have the tools they need to foster the highest level of student growth.

Mooney, Kellie. Kellie is an intervention specialist at Capital High School. Kellie worked in many capacities to serve students ages 3 to 22 with disabilities, including paraprofessional, therapeutic behavior support, and Level 3 autism interventionist.

Osborn, Jan. Jan's career began in 1972 as a special educator in Wadsworth City Schools, but Jan has been a part of the Ohio Coalition for the Education of Children with Disabilities for the past 40 years as a staunch advocate for policies that support students with disabilities.

Painter, Sarah. Sarah works as transition coordinator, serving students in all disability categories aged 14–22 in Westerville City School District. In the past, Sarah worked in various programs that provided services to recently graduated students with disabilities in need of additional services and supports.

Rellinger, Lindsay. Lindsay is a special education director through the North Central Ohio Educational Service Center. Lindsay worked as a consultant with schools on various topics in the field of special education. Prior to this role, Lindsay was the director of student services for Fremont City Schools.

Wildenhaus, Colleen. Colleen is a school administrator in the Licking Heights Local Schools district and a parent to a student with a disability. Colleen brings to the panels more than 20 years of experience in working with students.

Quadrants 3 and 4

Brewka, Thelma. Thelma currently works as a special education teacher in Milford Exempted Village School District. Thelma has done work related to a comprehensive co-teaching model that ensures students with disabilities can experience an inclusive and supportive educational environment.

Brownley, Jack. Jack brings 45 years of experience to the special education field. Jack is currently the special education director in Franklin Local School District and serves with the Ohio Coalition for the Education of Children with Disabilities. Jack worked in many capacities during this career, including as a principal, a teacher, and a member on the County Board of Developmental Disabilities.

Franklin, Jason. Jason is the director for social and emotional learning at the Ohio School for the Deaf and Ohio State School for the Blind. Prior to starting there in 2018, Jason worked as a transition coordinator, supporting students with disabilities ages 5–22.

Gehr, Angela. Angela has worked with students with disabilities for 20 years in various roles, such as an intervention specialist, a special educator, and an education supervisor. Angela currently works as a special education coordinator and director in New Miami Local Schools. Angela also has experience as a caseworker for Children's Services.

George, Jacob. Jacob works as special education director in the Greeneview Local Schools district. Jacob has committed time to strengthening the opportunities for the most vulnerable students and families to bring value to the school community.

Hill (Schroder), Kasandra. Kasandra brings more than 10 years of experience in special education and is the special education director in the Wapakoneta City Schools district.

Kasandra continues to bring issues with students with disabilities to the forefront so that they do not continue to be a population that is overlooked.

Janson, Melinda. Melinda brings more than 23 years of special education experience and currently is an intervention specialist in the Piqua City Schools district. Melinda served as the remote learning coordinator for K–3 students the previous school year and leads conversations about how to improve special education.

Leppert, Erica. Erica is a special education director and has worked across multiple school districts for 20 years. Currently in Indian Hill Exempted Village School District, Erica is a member of a committee that explores how to support students with disabilities and minimize barriers to equitable educational opportunities.

Lockwood, Kristal. Kristal has experience as an intervention specialist, special education coordinator, and now virtually as a special education director in Ohio Digital Learning School.

Mills, Kristen. Kristen works as a high school principal in Tri-County North School District and previously co-taught at an international school in Dayton, Ohio. Kristen has experience in both large urban and small rural schools and advocates for best practices in special education for students with disabilities.

Pavlic-Roseberry, Georgia. Georgia is an outside agency partner and former special education director in Buckeye Local School District. Georgia wants to advocate for students in rural areas with low-incidence disabilities so that Jefferson County can continue to do more for its students.

Thompson, Erica. Erica is a special education director in Middletown City School District and previously was an intervention specialist for more than 10 years. Erica has worked with preschool students through transition phases and has experience with monitoring and coaching teachers on how to best serve students with disabilities.

Townsend, Andrea. Andrea has been in a leader in special education policy for almost 20 years and currently works as special education director in Greenville City School District. Andrea recently earned her doctorate doing research on how bias plays a role in opportunities for children and working against those biases that come against students with disabilities.

A.8. Professional Judgment Panel Session Outlines and Homework

Session 1 Agenda

- Introductions
- Description of PJP process
- Discussion about Goals Statement
- Gathering panelist input on best practices
- Explanation of next steps

Session 1 Homework

- Panelists were asked to continue adding their input to the collective virtual whiteboard about the best practices for each disability classification.

Session 2 Agenda

- Welcome
- Review of description of process; Goals Statement
- Continuation of gathering panelist input on best practices for each disability classification

Session 2 Homework

Panelists were asked for their input on the following for the disabilities their panel discussed:

- Which staff members would be involved with direct services, indirect services, and case management if best practices were implemented?
- How much time would each position typically allocate for all three age bands (early childhood, elementary/middle, high) if best practices were implemented?
- What a typical group size would be served by that position if best practices were implemented?
- What materials or equipment would typically be used to implement best practices and how many students might use that material or equipment?

Session 3 Agenda

- Welcome
- Review of panelists' homework in RCM tables
- Group discussion and feedback on weekly service time foreach staff member serving students in each disability classification if best practices were implemented

Session 3 Homework

- Panelists were asked to continue adding their input to the collective virtual whiteboard about weekly service time for each staff role if best practices were implemented for students with disabilities.

Special Education in Ohio: Best Practices, Costs, and Policy Implications

Session 4 Agenda

- Welcome
- Continuation of review of panelists' homework in RCM tables
- Group discussion and feedback on weekly service time for each staff member if best practices were implemented

Session 4 Homework

- Panelists were informed of additional voluntary sessions and encouraged to sign up.
- For those who volunteered to participate in additional sessions, we asked them to describe the best practices associated with providing transportation for students with disabilities and the resources (both personnel and nonpersonnel) needed to implement the best practices.

Session 5 Agenda

- Welcome
- Introduction of combined panel
- Group discussion on professional development needed for specific roles if best practices were implemented

Session 5 Homework

- Panelists were asked to review and adjust, if needed, prepopulated tables with estimated average weekly service time (as discussed in panel sessions) for personnel providing direct services, indirect services, and case management for staff positions across disability classifications.

Session 6 Agenda

- Welcome
- Group discussion about the estimated average weekly service time (from homework assignments) for each staff role in each disability classification
- Closing and reminder of next session

Session 7 Agenda

- Welcome
- Group review of per-student cost estimates models for each staff role in each disability classification
- Closing

Appendix B. Technology Study and Stakeholder Input

B.1. Technology Interviewee Email

Dear Educator,

The American Institutes for Research® (AIR®) is partnering with the Ohio Department of Education (ODE) to identify evidence-based best practices related to the use of technology to enhance special education and related services, including the impact of the COVID 19 pandemic. The goal is to understand how service providers, schools, and districts leveraged technology to serve students with disabilities during the COVID-19 pandemic. AIR also wants to understand how technology continues to be used to meet the needs of students with disabilities. Lastly, AIR would like to understand how assistive technology is being used to provide special education and related services for students with disabilities. In this study, assistive technology is defined as technology used by students with disabilities to perform functions that might otherwise be difficult or impossible. Assistive technology is defined on a student's individualized education program (IEP) and could be any item, piece of equipment, software program, or product system used to increase, maintain, or improve the functional capabilities of students with disabilities.

To accomplish this task, AIR is recruiting expert practitioners to participate in a voluntary one-hour virtual interview about technology usage (both educational and assistive technology) for students with disabilities. Your participation in this interview could inform future policy discussions at the state level. Your name will not be associated with any specific information or finding derived from the interview. Moreover, all findings will be presented collectively and in aggregate.

Please complete this application (https://airtable.com/shrg0bDuBGJ22eynG) so our study team can learn about your work and how it relates to the use of technology and students with disabilities.

IMPORTANT: Please complete and submit your application by **07/25/2022**. The study team will review your application and contact those that have been selected for the virtual interviews.

If you have any questions about the application or the study, please contact me at Ohio_Study@air.org or 919-918-2321.

Sincerely,

Amanda Danks
Senior Researcher, American Institutes for Research

B.2. Technology Interviewee Application

Dear Educator,

The American Institutes for Research® (AIR®) is partnering with the Ohio Department of Education (ODE) to identify evidence-based best practices related to the use of technology to enhance special education and related services, including the impact of the COVID 19 pandemic. The goal is to understand how service providers, schools, and districts leveraged technology to serve students with disabilities during the COVID-19 pandemic. AIR also wants to understand how technology continues to be used to meet the needs of students with disabilities. Lastly, AIR would like to understand how assistive technology is being used to provide special education and related services for students with disabilities. In this study, assistive technology is defined as technology used by students with disabilities to perform functions that might otherwise be difficult or impossible. Assistive technology is defined on a student's individualized education program (IEP) and could be any item, piece of equipment, software program, or product system used to increase, maintain, or improve the functional capabilities of students with disabilities.

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Please complete this application (https://airtable.com/shrg0bDuBGJ22eynG) so we can learn about your work and how it relates to the use of technology and students with disabilities.

IMPORTANT: Please complete and submit your application by 5/25/2022. We will review your application and contact those that have been selected for the virtual interviews by 5/27/2022. Interviews will be held between 06/01/2022-06/10/2022 of this year.

If you have any questions about the application or the study, please contact us at Ohio_Study@air.org or 919-918-2321.

Sincerely,

Amanda Danks
Senior Researcher
American Institutes for Research

Applicant Survey

First Name

Last Name

Email

Which school district are you primarily associated with based on your professional role?

Select the job title that most closely describes your current position in serving students with disabilities.

(Select only one option)
- Superintendent/Assistant Superintendent

- Special Education Director/Coordinator

- Principal/Assistant Principal

- Intervention Specialist serving students with specific learning disabilities or other health impairment minor

- Related Service Provider (i.e., occupational therapists, physical therapists, speech-language pathologists, audiologists, school psychologists, counselors, social workers, behavioral specialists)

- Intervention Specialist serving students with sensory impairments (i.e., teachers of the visually impaired, teachers of the deaf, orientation and mobility specialists, assistive technology)

- General Education Teacher or Curriculum Specialist

- Paraprofessional/Educational Aide

- Outside Agency Partner/Provider (i.e., state schools, departments of developmental disabilities, vocational programs, rehabilitation programs, educational service centers)

- Parent Mentor

- Parent Training and Information Center staff (Ohio Coalition for the Education of Children with Disabilities)

- Technology Specialist

- Other. Please specify

Select the grade level(s) that best describes your current position.

(Select all that apply)
- Early Childhood

- Elementary

- Middle

- Secondary

- All students in the district

Select the range of years that best represents the number of years you have held your current position.

(Select only one option)
- 1–5 years

- 6–10 years

- 11–15 years

- 16–20 years

- Over 20 years

Select the range of years that best represents the total number of years you have worked in special education.

(Select only one option)
- 1–5 years

- 6–10 years

- 11–15 years

- 16–20 years

- Over 20 years

Please indicate your highest level of education completed.

(Select only one option)
- High school diploma

- Associate degree

- Bachelor's degree

- Master's degree

- Doctoral degree

Have you ever been involved in the use of educational technology to serve students with disabilities?

- Yes

- No

- N/A

Select the range of years that best represents the total number of years your work tasks included providing educational technology to students with disabilities.

(Select only one option)

- 1–5 years
- 6–10 years
- 11–15 years
- 16–20 years
- Over 20 years
- N/A

Have you ever been involved in the use of assistive technology to serve students with disabilities?

- Yes
- No
- N/A

Select the range of years that best represents the total number of years your work tasks involved providing assistive technology to students with disabilities.

(Select only one option)

- 1–5 years
- 6–10 years
- 11–15 years
- 16–20 years
- Over 20 years
- N/A

Please tell us briefly how your expertise and experience can help us understand how educational and assistive technology are used to serve students with disabilities.

B.3. Technology Interview Protocol

Objective: Understand how schools use technology to serve students with disabilities during and post-COVID-19 pandemic (school closures and beyond).

As a part of the legislatively mandated studies commissioned by the Ohio Department of Education (ODE), the American Institutes for Research® (AIR®) is conducting a research study to identify evidence-based practices, as well as the costs associated with those practices, for providing specially designed instruction and related services to students with disabilities.

As part of this study, AIR seeks to understand how service providers, schools, and districts leveraged technology to serve students with disabilities during the COVID-19 pandemic. AIR also wants to understand how technology has been used in education and continues to be used to meet the needs of students with disabilities.

This voluntary interview should take approximately 1 hour. Your input here will help us understand how technology was used and may inform future guidance, support, and policies related to technology for students with disabilities.

Your responses are confidential. We will not identify you by name in any reports or findings, and all findings will be presented collectively and in aggregate. Your responses and the information learned from the interview will not be used to evaluate you, your district, your school, or your students.

Do you have any questions about the study itself that I can answer?

Yes → [answer questions]
No → Great!

Are you okay with completing this interview?

I would like to record this interview so that I can focus on our discussion now and return to the recording later to take notes and be sure I capture your input. This recording will not be shared with anyone outside the AIR study team and will be deleted as soon as the study is complete. Recording is voluntary, and it is fine if you decide not to permit this recording.

Do I have your permission to record this interview?

Yes → Great! Let's get started.
No → No problem! Let's get started with the interview, and I will take notes.

Interviewee Information

First, I would like to know more about your role supporting Ohio's students. This helps me contextualize your experiences for our interview.

1. Please tell me about your role.

    a. Probe: What role do you have in providing special education and related services for students with disabilities?

    b. Probe: What experience do you have with using technology to serve students with disabilities?

2. In what district(s) do you spend most of your time providing services to students with disabilities?

COVID-19-Related School Building Closure Questions

One thing that ODE has an interest in understanding is how technology was used during COVID19-related school building closures for students with disabilities and how technology continues to be used upon return to the building in this new phase of the pandemic.

3. Please tell me about your experience with using technology to support students with disabilities during COVID-19-related school building closures.

    a. Probe: What was used? How? For whom? What new technology (e.g., devices, platforms, apps, software) were acquired and implemented? What already acquired technology (pre pandemic) was implemented?

4. Please tell me about any positive experiences you had with using technology during that time to provide services to students with disabilities.

    a. Probe: Improved tracking and delivery of services? Improved access to instruction?

    b. Probe: How did it impact student outcomes? Increased student engagement? Improved tracking of student progress? Increased engagement with students' family? Better communication?

5. Please tell me about any challenges you had with using technology during that time to provide services.

    a. Probe: Connectivity? Family capacity? Staff capacity? Device availability? Accessibility issues for students?

Current Technology Usage

6. Now that students have returned to the building, how is technology being used to provide special education and related services to students with disabilities?

   a. Probe: Did you return to using technology in the same manner as before the pandemic or were any strategies/software/platforms/and so forth used during school building closures maintained? If so, what is used? For whom? Why? What new strategies/programs are being used?

7. What are some best practices you see with technology usage in your current position?

   a. Probe: How do you know they are best practices? For what students do you see those practices used? Who is implementing those best practices? What devices, training, supports are used for those best practices?

8. Are there any other technology supports that you wish were available for providing special education and related services?

   a. Probe: What type of supports? Why? How would they be used? Why are these supports not currently available?

9. What barriers (if any) did you experience in using technology for serving students with disabilities during the COVID-19-related school building closures?

   a. Probe: What type of barriers? Why? How would they be mitigated?

Training and Professional Development

We understand that there are professional development opportunities about the usage of technology and want to learn more about what opportunities you have been offered or have experienced.

10. What professional development opportunities are available to you to help build knowledge or capacity about technology usage?

    a. Probe: Teachers? Building leaders? Instructional aids?

11. What professional development opportunities did you attend and engage in to help build capacity about technology usage?

    a. Probe: Teachers? Building leaders? Instructional aids?

12. What additional professional development opportunities were provided during the school building closure?

Special Education in Ohio: Best Practices, Costs, and Policy Implications

13. What other staff were typically involved in [*interviewer will cover each PD opportunity described in Question 12*] professional development opportunities?

    a. Probe: Ask about each opportunity mentioned in Question 12.

14. About how much time did you spend at [*interviewer will cover each PD opportunity described in Question 12*] professional development opportunities?

    a. Probe: Ask about each opportunity mentioned in Question 12.

15. Are there any topics within professional development for technology usage that you think are necessary but not currently being provided?

16. Were you provided with any ongoing professional development or coaching on technology usage after your formal training?

    a. Probe: If so, how frequently?

    Does your district have a common set of expectations for technology competencies for all teachers (both general education and special education)? Do they include the use of accessible digital materials and assistive technology?

    Note: Specific questions related *to assistive technology will be asked after the next section.*

Technology and Assessments

Assessing students with disabilities is an important part of providing special education and related services, along with gathering data to report at the district, state, and federal levels.

17. In your experience, how has technology (education and assistive) been leveraged to ensure that assessments (statewide and classroom) are accessible by students with disabilities?

18. Based on the work you do, what strategies related to technology are used to ensure that students with disabilities can fully demonstrate what they know and are able to do?

19. In your experience, what strategies are used to align instructional accommodations that use technology with accommodations used for assessment for students with disabilities?

Assistive Technology

Assistive technology is technology used by students with disabilities to perform functions that might otherwise be difficult or impossible. It is defined on a student's individualized education program (IEP) and could be any item, piece of equipment, software program, or product system used to increase, maintain, or improve the functional capabilities of students with disabilities.

20. In your experience, in what ways are assistive technology used to engage and empower students with disabilities?

21. Based upon the student needs in your district, please describe some of the assistive technology devices and specific features that you see used most often to support students with disabilities?

    a. Probe: What about others you may see in IEPs? Gather as many specifications as possible about each device mentioned, along with the features needed to serve students.

22. What professional development opportunities are available to you about the use of assistive technology for students with disabilities?

    a. Probe: Teachers? Building leaders? Instructional aids?

23. What professional development opportunities did you attend and engage in to help build capacity about assistive technology usage?

    a. Probe: Teachers? Building leaders? Instructional aids?

24. Are there any other aspects of technology usage for students with disabilities that I forgot to ask about today? Is there anything else you would like to add?

Thank you again for your time today and for all you do for students in Ohio! It was great speaking with you, and I enjoyed learning more about how technology is used for students with disabilities. If you think of anything else you would like to add, please email Amanda Danks, senior researcher at AIR (Ohio_Study@air.org) so we can be sure that information is included.

Have a great day!

B.4. Technology Survey Instrument

Email to Potential Respondents

Dear Educator,

The American Institutes for Research® (AIR®) is partnering with the Ohio Department of Education (ODE) to identify evidence-based best practices related to the use of technology to enhance special education and related services, including the impact of the COVID 19 pandemic. The goal is to understand how service providers, schools, and districts leveraged technology to serve students with disabilities during the COVID-19 pandemic. AIR also wants to understand how technology (both educational and assistive technology) continues to be used to meet the needs of students with disabilities. In this study, assistive technology is defined as technology used by students with disabilities to perform functions that might otherwise be difficult or impossible. Assistive technology is defined on a student's individualized education program (IEP) and could be any item, piece of equipment, software program, or product system used to increase, maintain, or improve the functional capabilities of students with disabilities. Lastly, AIR wants to understand the professional development opportunities available to you that focus on the use of technology to support students with disabilities.

To accomplish this task, **AIR is asking you to complete a 15-minute survey** about your experience with technology usage (both educational and assistive technology) for students with disabilities. Your participation in this survey could inform future policy discussions at the state level. Your name will not be associated with any specific information or finding derived from the survey. Moreover, all findings will be presented collectively and in aggregate.

Please complete this survey (LINK) by 09/07 so our study team can learn more about your use of technology to support students with disabilities.

If you have any questions about the survey or the study, please contact me at Ohio_Study@air.org or 919-918-2321.

Sincerely,

Amanda Danks
Senior Researcher, American Institutes for Research

SURVEY

As a part of the legislatively mandated studies commissioned by the Ohio Department of Education (ODE), the American Institutes for Research® (AIR®) seeks to understand how service providers, teachers, and school and district leaders leveraged technology to serve students with disabilities during the COVID-19 pandemic. AIR also wants to understand how technology continues to be used to meet the needs of students with disabilities.

Your input will help us understand technology usage and may inform future guidance, support, and policies related to technology for students with disabilities.

Participation is voluntary, your responses are confidential, and it should only take about 15 minutes to complete. We will not identify you by name in any reports or findings, and all findings will be presented in the aggregate. Your responses and the information learned from the survey will not be used to evaluate you, your district, your school, or your students. If you have any questions about this survey or the study overall, please contact Amanda Danks, senior researcher at AIR (Ohio_Study@air.org).

Getting to Know You

1. What is your current role(s)/position(s). *(Check all that apply.)*
    a. Special educator
    b. General educator
    c. Teaching assistant/Paraeducator
    d. Related service provider
    e. School counselor
    f. School technology coordinator
    g. School assistive technology coordinator
    h. School special education coordinator
    i. Principal
    j. Assistant principal
    k. District special education coordinator
    l. District technology coordinator
    m. District Assistive technology coordinator
    n. Superintendent
    o. Other; please specify: _____

2. In what district do you spend most of your time providing services to students with disabilities?

    <pipe in a list of all Ohio districts>

3. How long have you been working in your current position?

    a. 1–5 years
    b. 6–10 years
    c. 11–15 years
    d. 16–20 years
    e. More than 20 years

COVID-19-Related School Closure Questions

ODE is interested in understanding is how educational and assistive technology was used with students with disabilities during COVID-19-related school closures and how technology continues to be used. **Educational technology** is any technology used to provide instruction for students with disabilities. **Assistive technology** is technology used by students with disabilities to perform functions that might otherwise be difficult or impossible. Assistive technology is defined on a student's individualized education program (IEP) and could be any item, piece of equipment, software program, or product system used to increase, maintain, or improve the functional capabilities of students with disabilities.

4. In your school/district, in what ways was **educational technology** used to provide services for students with disabilities during COVID-19-related school closures? (*Select all that apply.*)

    a. In-person instruction
    b. Remote instruction (including participation in general education activities and individualized instruction)
    c. In-person related services
    d. Remote related services and therapies
    e. Meetings and communication with family (including individualized education program [IEP] meetings)
    f. Meetings with other staff
    g. Translation services
    h. Other [fill in]

5. In your school/district, in what ways was **assistive technology** used to provide services for students with disabilities during COVID-19-related school closures? *(Select all that apply.)*

    a. In-person instruction
    b. Remote instruction (including participation in general education activities and individualized instruction)
    c. In-person related services
    d. Remote related services and therapies

e. Meetings and communication with family (including individualized education program [IEP] meetings)

f. Meetings with other staff

g. Translation services

h. Other [fill in]

6. In the school/district you work in, what **new** technology tools (e.g., devices, platforms, apps, software) were acquired and implemented to support students with disabilities during COVID-19-related school closures?

a. Google classroom

b. Zoom

c. Teams

d. Tablet for each student

e. Laptop for each student

f. JAWS

g. Screen Cast application

h. Class Dojo

i. Proloquo

j. Asynchronous learning tools

k. Online textbooks

l. Online progress monitoring tools

m. Artificial intelligence (AI)

n. Learning management system (LMS)

o. Other: please specify: _____

7. In the school/district you work in, what successes did you have with using technology to provide services to students with disabilities during COVID-19-related school closures? *(Select all that apply.)*

a. Increased family engagement in services for students

b. Increased family engagement in the IEP process

c. Increased communication with families

d. Increased student engagement (e.g., more comfort with virtual engagement)

e. Learned more about student home environments through virtual engagement

f. Enhanced opportunities to track student progress towards academic outcomes and IEP goals

g. Successful delivery of teletherapy

h. Delivered synchronous and asynchronous instruction/therapy

i. Increased communication with other service providers

j. Enhanced ability to monitor services

k. Other: please specify: _____

8. In the school/district you work in, what challenges did you experience in using technology for serving students with disabilities during the COVID-19-related school closures? *(Select all that apply.)*
   a. Internet connectivity for students

   b. Internet connectivity for teachers or related service providers

   c. Family capacity to use technology

   d. Staff capacity to use technology

   e. Student capacity to use technology

   f. Device availability

   g. Accessibility issues for students when using technology

   h. Lack of hands-on support

   i. Inadequate training on how to use technology

   j. Low student engagement

   k. Effective communication with students in a virtual environment

   l. Other: please specify: _____

Current Use of Technology

We would like to understand how educational and assistive technology are being used now that schools are back to more typical operation, along with what lessons you learned over the past few years about the use of technology to support students with disabilities.

9. Now that schools are transitioning to the next phase of the pandemic, how does technology continue to be used to provide special education and related services to students with disabilities in the school/district you work in?
   a. We now provide more small-group instruction with the support of technology.

   b. We now have a codified commitment to providing a device for each student.

   c. Assistive technology is now more readily available to teachers and related service providers.

   d. We now offer hybrid instruction.

e. We now regularly offer teletherapy.

f. We now communicate more frequently with families.

g. We now have more opportunities to collaborate with other service providers.

h. We returned to using technology in the same manner as before the pandemic.

10. Please tell us about of the usefulness of technology in your current practice for the following services. For each service component, please indicate to what extent technology is helpful for you to provide services and supports to students with disabilities.

Service component	Not applicable to my role	Technology makes this task more difficult	Technology is not helpful	Technology is somewhat helpful	Technology is extremely helpful
General education instruction					
Specially designed instruction					
Accessibility to assessments (statewide and classroom)					
Instructional accommodations					
Related services					
Remote remedial services					
Teletherapy					
Speech language therapy					
Physical therapy					
Occupational therapy					
One-on-one aide					
Assist in the development of social interaction and communication skills (social skills) of students with disabilities					
Collaborate with social service or other agency partners (e.g., behavioral health, vocational rehabilitation) to meet IEP requirements.					
Engage families in the IEP process.					

Special Education in Ohio: Best Practices, Costs, and Policy Implications

Infrastructure Supports and Professional Development

We would like to understand more about the infrastructure supports and professional development opportunities available to you for both educational and assistive technology.

11. Does your district have a common set of expectations for technology competencies for all teachers (both general education and special education)?
    a. Yes
    b. No
    c. Don't know

12. In your school/district, which of the following infrastructure supports are available to support technology use to enhance instruction and assessment of students with disabilities? (*Select all that apply.*)
    a. High-speed connectivity
    b. Sufficient number of devices for instruction with students who have a disability
    c. Accessible digital educational materials for students with disabilities
    d. Reliable learning management system
    e. Staff trained to set up technology (e.g., technology specialist or coordinator)
    f. Continuous coaching supports for ongoing technology usage
    g. Assistive technology specialist
    h. Appropriate applications and software
    i. On-demand professional learning resources
    j. Other; please specify: _____

13. What types of professional development have you received from your school, district, or state about ways to leverage technology to provide special education and related services? (*Select all that apply.*)
    a. Live virtual professional development
    b. Live in-person professional development
    c. Recorded professional development
    d. Coaching
    e. In-class/In-service support
    f. Other _____

14. We would like to know more about the types of professional development you received about the use of technology and the frequency of those opportunities. Thinking about the 2021–22 school year, what types and frequency of professional development did you receive to build capacity **about the use of technology for students, including students with disabilities**? For each type of professional development, please put the number of hours and the appropriate frequency. Please round to the nearest hour. If you did not receive a certain type of professional development, please select "**Not Received**" in the "Frequency" box.

	Daily	Weekly	Monthly	Quarterly	Biannual	Annual
a. Educational Tech: Coaching						
b. Educational Tech: Virtual training						
c. Educational Tech: In-person training						
d. Educational Tech: Workshops						
e. Educational Tech: Recorded training						

15. We would like to know more about the types of professional development you received about using assistive technology and the frequency of those opportunities. Thinking about the 2021–22 school year, what types and frequency of professional development did you receive to build capacity **about the use of assistive technology for students with disabilities**? For each type of professional development, please put the number of hours and the appropriate frequency. Please round to the nearest hour. If you did not receive a certain type of professional development, please select "**Not Received"** in the "Frequency" box.

	Daily	Weekly	Monthly	Quarterly	Biannual	Annual
a. Assistive Tech: Coaching						
b. Assistive Tech: Virtual training						
c. Assistive Tech: In-person training						
d. Assistive Tech: Workshops						
e. Assistive Tech: Recorded training						

16. Thinking about the 2021–22 school year, which of the following topics about how to use technology to support students with disabilities were covered in professional development opportunities for you and/or your team? (*Select all that apply).*

    a. How to use technology to increase access to the general education curriculum and assessments

    b. How to plan accessible instruction

    c. How to incorporate assistive technology into instruction

    d. How to develop and use accessible educational materials

    e. How to increase student engagement using technology

    f. How to engage families using technology

    g. Technology available for the arts (e.g., visual, music)

    h. Technology available for physical education

    i. Available applications that support collaboration among teachers and service providers

    j. How to use the IEP-at-a-glance feature in an online IEP platform

    k. How to use technology for students with sensory impairments

    l. Demonstrations of technology in action

    m. Other _____

17. Which of the following topics do you think staff need professional development on but are not currently provided in your school/district?

    a. How to use technology to increase access to the general education curriculum and assessments

    b. How to plan accessible instruction

    c. How to incorporate assistive technology into instruction

    d. How to develop and use accessible educational materials

    e. How to increase student engagement using technology

    f. How to engage families using technology

    g. Technology available for the arts (e.g., visual, music)

    h. Technology available for physical education

    i. Available applications that support collaboration among teachers and service providers

    j. How to use the IEP-at-a-glance feature in an online IEP platform

    k. How to use technology for students with sensory impairments

    l. Demonstrations of technology in action

    m. Other _____

Special Education in Ohio: Best Practices, Costs, and Policy Implications

Thank you for taking time to complete this survey. This information will help us understand best practices for the use of technology when providing special education and related services to students with disabilities. If you have any questions about this study, please email Amanda Danks, senior researcher at AIR (Ohio_Study@air.org).

B.5. Technology Survey Response Summaries

Exhibit B.5.1 Reported Quadrants of Survey Respondents

Quadrant	Percentage
West Quadrant	33%
Central Quadrant	22%
Northeast Quadrant	21%
Southeast Quadrant	13%
Unknown	12%

Exhibit B.5.2. Reported Function of Educational Technology During COVID-19-Related School Closures (Percentage of All Survey Respondents)

Function	Percentage
In-person instruction	52%
Remote instruction	90%
In-person related services	41%
Remote related services and therapies	80%
Meetings and communication with family	93%
Meetings with other staff	77%
Translation services	24%

Note. Respondents were able to select all that applied, which makes the total percentages here greater than 100%.

Exhibit B.5.3. Reported Function of Assistive Technology During COVID-19-Related School Closures (Percentage of All Survey Respondents)

Function	Percentage
In-person instruction	42%
Remote instruction	74%
In-person related services	36%

Special Education in Ohio: Best Practices, Costs, and Policy Implications

Remote related services and therapies	63%
Meetings and communication with family	48%
Meetings with other staff	41%
Translation services	11%

Note. Respondents were able to select all that applied, which makes the total percentages here greater than 100%.

Exhibit B.5.4. Reported Successes With the Use of Technology During COVID-19-Related School Closures (Percentage of All Survey Respondents)

Successes	Percentage
Increased family engagement in services for students	40%
Increased family engagement in the IEP process	42%
Increased communication with families	55%
Increased student engagement (e.g., more comfort with virtual engagement)	20%
Learned more about student home environments through virtual engagement	70%
Enhanced opportunities to track student progress towards academic outcomes and IEP goals	19%
Successful delivery of teletherapy	27%
Delivered synchronous and asynchronous instruction/therapy	38%
Increased communication with other service providers	27%
Enhanced ability to monitor services	10%

Note. Respondents were able to select all that applied, which makes the total percentages here greater than 100%.

Exhibit B.5.5. Reported Challenges With the Use of Technology During COVID-19-Related School Closures (Percentage of All Survey Respondents)

Challenges	Percentage
Internet connectivity for students	86%
Internet connectivity for teachers or related service providers	47%
Family capacity to use technology	83%
Staff capacity to use technology	39%
Student capacity to use technology	73%
Device availability	31%
Accessibility issues for students when using technology	49%

Special Education in Ohio: Best Practices, Costs, and Policy Implications

Lack of hands-on support	62%
Inadequate training on how to use technology	37%
Low student engagement	72%
Effective communication with students in a virtual environment	35%

Note. Respondents were able to select all that applied, which makes the total percentages here greater than 100%.

Exhibit B.5.6. Reported Technology Tools Acquired by Schools and Districts During COVID-19-Related School Closures (Percentage of All Survey Respondents)

Technology tools	Percentage
Google Classroom	70%
Zoom	75%
Teams	14%
Tablet for each student	14%
Laptop for each student	58%
JAWS	1%
Screen Cast Application	26%
Class Dojo	21%
Proloquo	2%
Asynchronous learning tools	31%
Online textbooks	32%
Online progress monitoring tools	33%
Learning management system	15%

Note. Respondents were able to select all that applied, which makes the total percentages here greater than 100%.

Exhibit B.5.7. Infrastructure Supports Currently Available to Support Technology Usage (Percentage of All Survey Respondents)

Infrastructure supports	Percentage
High-speed connectivity	67%
Sufficient number of devices for instruction with students who have a disability	74%
Accessible digital educational materials for students with disabilities	52%
Reliable learning management system	35%

Special Education in Ohio: Best Practices, Costs, and Policy Implications

Staff trained to set up technology (e.g., technology specialist or coordinator)	66%
Continuous coaching supports for ongoing technology usage	38%
Assistive technology specialist	20%
Appropriate applications and software	48%
On-demand professional learning resources	27%

Note. Respondents were able to select all that applied, which makes the total percentages here greater than 100%.

Exhibit B.5.8. Professional Development Structures Offered About Educational and Assistive Technology (Percentage of All Survey Respondents)

Professional development structures	Percentage
Live virtual professional development	54%
Live in-person professional development	50%
Recorded professional development	48%
Coaching	31%
In-class/In-service support	27%

Note. Respondents were able to select all that applied, which makes the total percentages here greater than 100%.

Exhibit B.5.9. Professional Development Topics Covered Regarding Educational and Assistive Technology (Percentage of All Survey Respondents)

Professional development topics covered	Percentage
How to use technology to increase access to the general education curriculum and assessments	45%
How to plan accessible instruction	32%
How to incorporate assistive technology into instruction	19%
How to develop and use accessible educational materials	34%
How to increase student engagement using technology	31%
How to engage families using technology	22%
Technology available for the arts (e.g., visual, music)	11%
Technology available for physical education	7%
Available applications that support collaboration among teachers and service providers	25%
How to use the IEP-at-a-glance feature in an online IEP platform	27%
How to use technology for students with sensory impairments	10%
Demonstrations of technology in action	24%

Note. Respondents were able to select all that applied, which makes the total percentages here greater than 100%.

Special Education in Ohio: Best Practices, Costs, and Policy Implications

Exhibit B.5.10. Professional Development Topics Reported to Be Needed Regarding Educational and Assistive Technology (Percentage of All Survey Respondents)

Professional development topics needed	Percentage
How to use technology to increase access to the general education curriculum and assessments	38%
How to plan accessible instruction	43%
How to incorporate assistive technology into instruction	49%
How to develop and use accessible educational materials	44%
How to increase student engagement using technology	42%
How to engage families using technology	40%
Technology available for the arts (e.g., visual, music)	29%
Technology available for physical education	25%
Available applications that support collaboration among teachers and service providers	33%
How to use the IEP-at-a-glance feature in an online IEP platform	21%
How to use technology for students with sensory impairments	51%
Demonstrations of technology in action	38%

Note. Respondents were able to select all that applied, which makes the total percentages here greater than 100%.

Exhibit B.5.11. Usefulness of Technology in Current Practice (Percentage of All Survey Respondents)

	Not applicable to my role	Technology is extremely helpful	Technology is not helpful	Technology is somewhat helpful	Technology makes this task more difficult
Accessibility to assessments (statewide and classroom)	16%	42%	4%	35%	3%
Assist in the development of social interaction and communication skills (social skills) of students with disabilities	13%	14%	20%	34%	19%
Collaborate with social service or other agency partners (e.g., behavioral health, vocational rehabilitation) to meet IEP requirements	24%	32%	6%	36%	2%

Special Education in Ohio: Best Practices, Costs, and Policy Implications

	Not applicable to my role	Technology is extremely helpful	Technology is not helpful	Technology is somewhat helpful	Technology makes this task more difficult
Engage families in the IEP process	3%	46%	6%	42%	4%
General education instruction	45%	31%	1%	22%	1%
Instructional accommodations	10%	33%	7%	46%	4%
Occupational therapy	68%	9%	8%	11%	4%
One-on-one aide	57%	4%	15%	16%	8%
Physical therapy	74%	3%	9%	9%	5%
Related services	26%	21%	10%	38%	5%
Remote remedial services	52%	19%	4%	20%	5%
Specially designed instruction	5%	40%	6%	46%	3%
Speech language therapy	53%	17%	4%	22%	4%
Teletherapy	65%	16%	2%	13%	4%

Exhibit B.5.12. How Technology Continues to Be Used to Support Students With Disabilities (Percentage of All Survey Respondents)

How technology used	Percentage
We now provide more small-group instruction with the support of technology.	29%
We now have a codified commitment to providing a device for each student.	36%
Assistive technology is now more readily available to teachers and related service providers	32%
We now offer hybrid instruction.	10%
We now regularly offer teletherapy.	7%
We now communicate more frequently with families.	26%
We now have more opportunities to collaborate with other service providers.	23%
We returned to using technology in the same manner as before the pandemic.	40%

Note. Respondents were able to select all that applied, which makes the total percentages here greater than 100%.

Special Education in Ohio: Best Practices, Costs, and Policy Implications

B.6. Stakeholder Input

Stakeholder Outreach

Public stakeholder groups	Nonpublic stakeholder groups
Ohio Coalition for the Education of Children with Disabilities	Central Catholic
Trustees of the Ohio Association of County Boards of Developmental Disabilities	Holy Family
Ohio School Boards Association	Julie Billiart Schools
Buckeye Association of School Administrators	St. Joseph Maumee
State Advisory Panel for Exceptional Children	Delaware Christian
Ohio Center of Educational Options	Heritage Christian
Office of Nonpublic Education Options	Lawrence School
	Mansfield Christian
	St. Albert the Great
	St. Francis De Sales School

Stakeholder Input Session Agenda Summary

The stakeholder input sessions consisted of an overview of the purpose of the study and the approach used to identify best practices. The AIR study team then facilitated a discussion about each of the best practices identified by our Professional Judgment Panels. After each identified best practice was described, we used a Jamboard to collect additional information. Feedback from stakeholders included a discussion around what components resonated with participating stakeholders and what their key takeaways were about each best practice. The agenda is as follows:

- Overview of the study
- Presentation and discussion of key findings about identified best practices
  - Multidisciplinary teams
  - Case management
  - Technology
  - Indirect service
  - Professional development
  - Transportation
- Closing

Appendix C. Estimated Costs of Best Practices

C.1. Salary Information for Ohio Practitioners

The AIR study team used available compensation information to quantify the value of time staff spent on providing special education and related services. This information was incorporated into the RCM to support panel discussions and cost estimates. The information below summarizes how salary and benefits data were gathered and adjusted to reflect the actual cost of staff time.

The interactive RCM uses measures of compensation (salary plus benefits) for a variety of public school staff. To compile these staff "prices," annual salary information for the 84 positions warehoused in the Ohio Education Management Information System (EMIS) was used to calculate a statewide average salary for each job type.[12] To account for the fact that resource prices vary systematically across higher and lower cost labor markets in the state, the district-specific salaries were first "standardized" to statewide average price levels using the Comparable Wage Index for Teachers (CWIFT).[13] Three indices are available at the district, county, and state levels, each centered on 1.0 representing the national average. For example, a district index value of 1.10 indicates that it cost 10% more than the national average to hire and retain educational staff in the given district. Application of the indices is used to produce staff salaries adjusted to control for the influence of local labor markets on prices and allow for legitimate comparisons across regions in a given state or the nation. This procedure was done for both districts and educational service centers (ESCs) included in the salary data, which were standardized to reflect Ohio average price levels using the district and county CWIFT indices. After the state-standardized prices for each position generated averages across districts and ESCs, statewide weighted averages were calculated using the number of full-time equivalents (FTEs) employed in each district/ESC.

The statewide average salary data were then adjusted to account for benefits using a benefit rate of 37% derived from federal statistics from the Public Education Financial Survey on statewide spending on benefits and salaries for educational staff in Ohio. Specifically, a ratio of the total statewide spending on benefits to salaries was calculated and applied to salaries to generate a total compensation rate for each position. The annual compensation rates were populated in the RCM and used to estimate the cost of various staff members' time in serving students with disabilities.

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[12] District-level data on average annual salaries and FTEs for each EMIS position type in 2021 were downloaded from ODE's *Education Employee Positions and Demographics—Public* (2022b). Definitions of the EMIS positions are in the *ODE EMIS Manual* (ODE, 2013).
[13] The CWIFT index measure was developed by the National Center for Education Statistics (NCES, n.d.b) to facilitate comparison of educational expenditures across different geographic labor markets.

Exhibit C.1.1 shows the estimated salary, inclusive of benefits, for each position used in the cost study.

**Exhibit C.1.1. Compensation by Position**

Position title	Salary
Adapted physical education teacher	$98,063
Audiologist	$93,960
Dietician/nutritionist	$70,213
ESC supervisor	$115,351
General educator	$87,340
Interpreter for student	$49,737
Mobility therapist	$95,888
Nurse	$35,263
Occupational therapist	$86,075
Occupational therapy assistant	$53,008
Paraprofessional	$31,113
Parent mentor	$32,525
Physical therapist	$86,475
Physical therapist assistant	$54,743
Reading/math specialist	$78,865
Registered nurse	$70,609
Remedial specialist	$84,207
School counselor	$89,682
School psychologist	$94,767
School resource officer	$52,674
Social worker	$70,401
Special education director	$116,768
Special educator	$81,280
Speech language therapist	$84,528
Assistant principal	$112,338
Bus driver	$29,364
Principal	$127,390
Special education coordinator	$84,655
Special vehicle driver	$30,241
Special education data administrator	$43,615

Special Education in Ohio: Best Practices, Costs, and Policy Implications

C.2. Estimated Costs of Best Practices by Schooling Level

In the Results section of this report, we present the average cost of implementing best practices for each disability classification. In those figures, we present averages that are not specific to a level of schooling level. To do so, we produced weighted averages of the cost of best practices in elementary school, middle school, and high school for each disability classification. In this appendix, we present the cost of best practices for each disability classification separately for early childhood, elementary/middle school, and high school. This information could inform discussions around funding decisions or add context to the figures shown in the text.

The costs presented in Exhibit C.2.1 are unweighted and come directly from the information gathered in PJPs for each schooling level.

Exhibit C.2.1. Estimated Annual Per-Student Cost of Implementing Best Practices by Specific Disability Classification for Each Schooling Level.

Special Education in Ohio: Best Practices, Costs, and Policy Implications
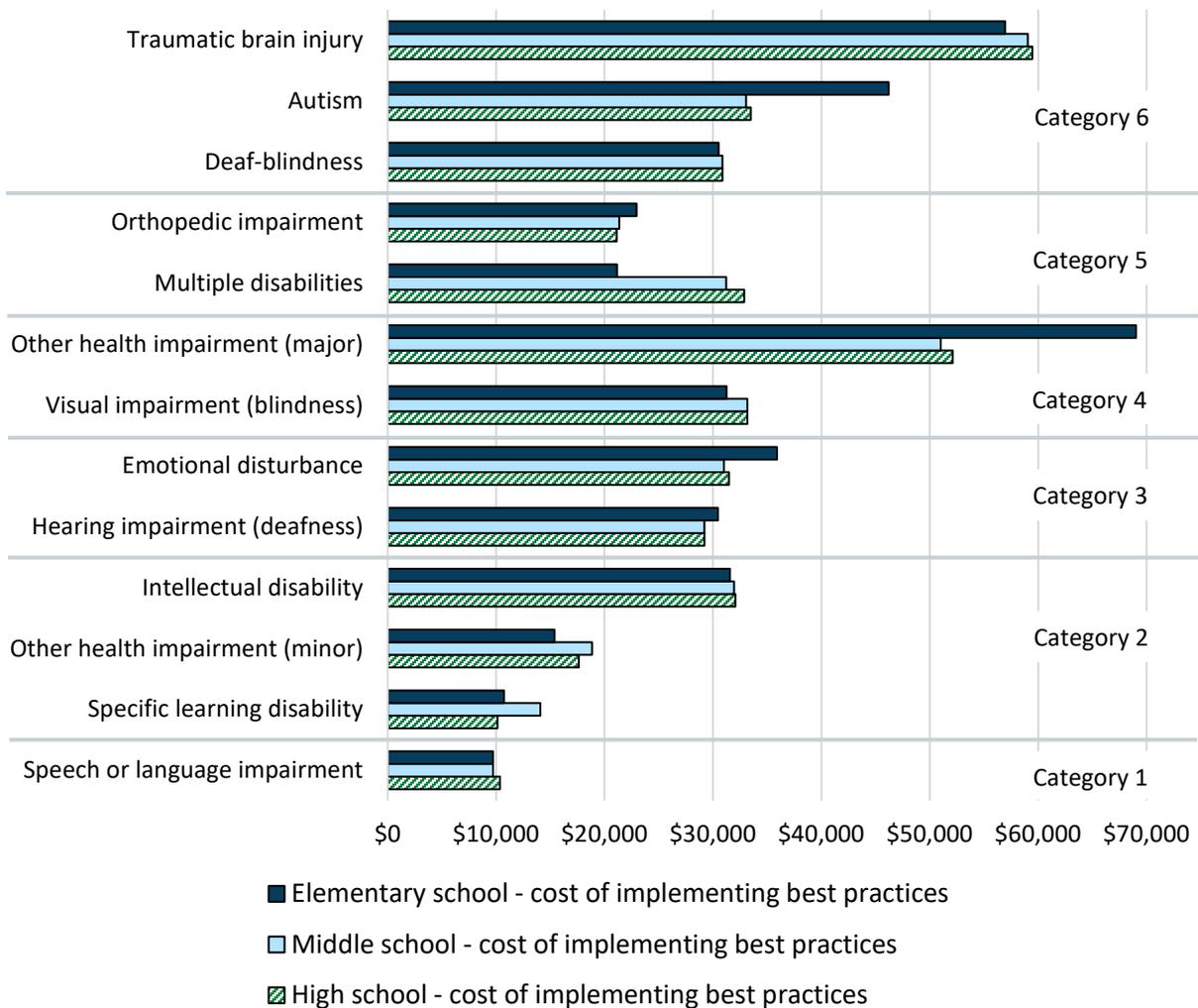
C.3. Adjusting Special Education Costs and Funding Weights to Account for the Substitution Effect

Exhibit C.3.1 depicts how the additional spending for a student receiving special education was calculated. As noted in the report text, it is important to differentiate between *special education expenditure* (the $17,402 listed in the top portion of the first column)[14] and the *additional expenditure* for a student receiving special education services. Special education expenditures account for all dollars spent on special education services, but do not account for the fact that some of these dollars replace (or substitutes for) what would typically be spent for a student's general education (the $15,633 listed in the top portion of the second column). The additional expenditure represents that portion of special education spending, after deducting what is spent for a student's general education services (the substitution effect).
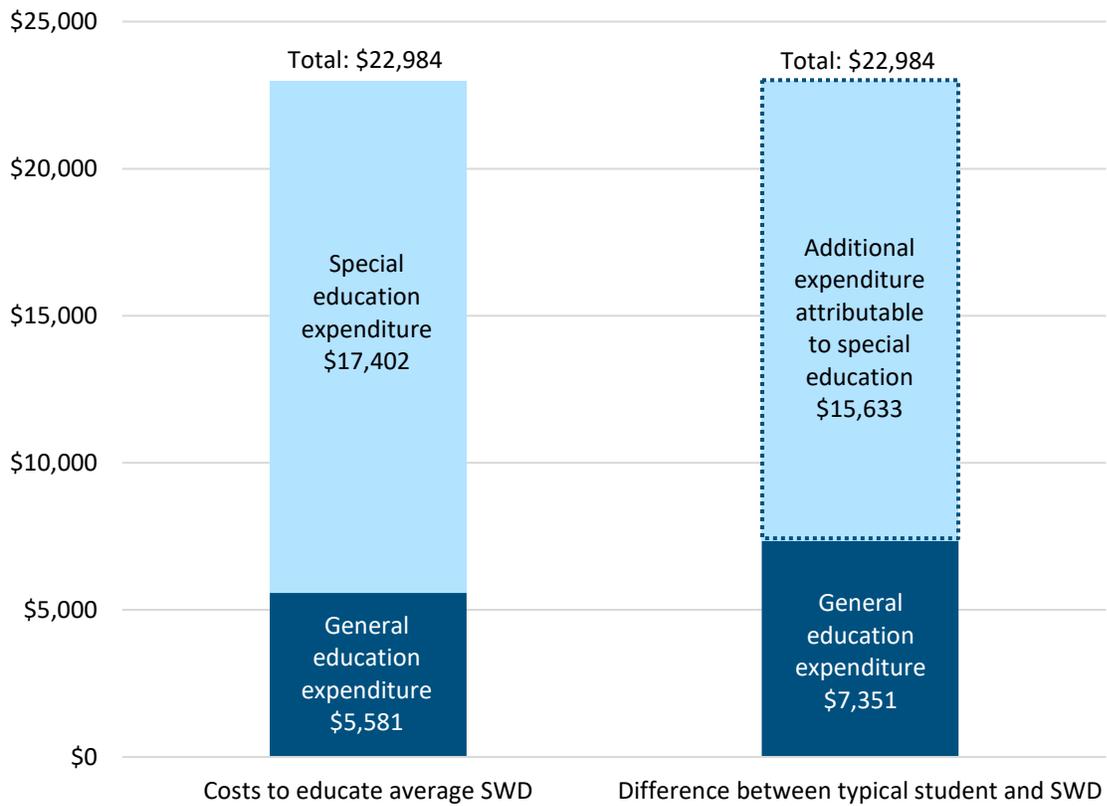
In our analyses, reported weights are calculated two ways – using the ratio of (1) average special education expenditure per-student to the average per-student general education expenditure ($17,402/$7,351); and (2) the average additional expenditure for a student receiving special education services to an average per-student general education expenditure ($15,633/$7,351).[15] Together, the weights from both calculations illustrate a potential range in values for the ratio of special to general education spending, reported here overall (for all students receiving special education services) and in the main report text by disability classification.

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[14] Note, the figure for special education expenditures in the chart is represented by the average best-practice cost estimate across all disability classifications from our analysis.

[15] The figure for average per-student general education expenditure in the bottom portion of the second column of the chart is represented by the ODE base per-student funding ($7,351).

Special Education in Ohio: Best Practices, Costs, and Policy Implications

Exhibit C.3.1. Illustration of Excess Cost for an Average Student With a Disability Compared With a Student Without a Disability

Total: $22,984 — Costs to educate average SWD
- Special education expenditure $17,402
- General education expenditure $5,581

Total: $22,984 — Difference between typical student and SWD
- Additional expenditure attributable to special education $15,633
- General education expenditure $7,351

Note. SWD = student with a disability.

C.4. Nonpersonnel Resources Indicated by Panelists

Nonpersonnel resources	
Laptop computer	Closed captioning for all audio-visual media
Sensory materials/tools	Hearing aids
Visual materials/aids	Visuals for directions
Behavioral supports	Accessible testing protocols and materials
Adaptive seating	Visual signals for all auditory signals in curricular and extracurricular settings
Board games	Multisensory, structured explicit reading
Sensory tools	Americans with Disabilities Act–compliant signage
Computer/laptop	Highlighter/reading strips
Daily living skills curriculum	Pencil grips
Fidgets, wiggle seats, therapy ball/bands	Adaptive furniture (e.g., seating, standers)
High-interest/low-interest reading books	Adaptive physical education equipment
Noise-canceling headphones	Service animal
Organization/memory technology	Wheelchair
Academic technology	Accessible changing facilities
Social stories	Accessible classroom desk
Appropriate technology applications	Accessible facilities
Textured surfaces	Accessible locker/storage area
Timers	Adaptive equipment such as adapted spoons
Visual aids	Adaptive playground equipment
Weighted vests	Catheterization facilities
Assistive technology	Mats
Frequency Modulation (FM) system	Personal hygiene accommodations
Adaptive materials (e.g., scissors, crayons)	Specialized equipment (e.g., gait trainer, safety device for stairs)

Special Education in Ohio: Best Practices, Costs, and Policy Implications

Appendix D. State Special Education Funding Policy Review

From IDEA's inception, there was no expectation that federal funding would cover the full cost of special education; state and local education budgets have always been expected to provide the balance of funding. During fiscal year (FY) 2020, federal special education grants to states (IDEA Part B, Section 611) comprised an estimated 13% of the national average per-student expenditure (Zembar, 2021).

Federal law does not require states to pay for special education programs; however, all states provide some form of supplemental state aid for local special education programs. Across time, states have developed very different approaches to providing state aid for special education. In fact, the existing policy landscape comprises 50 distinct state-specific approaches to allocating state aid. Even though each state policy is unique, most share common attributes in how (a) state contributions are determined and (b) the mechanisms used to distribute funding to LEAs

Determining State Funding Obligations

States differ in how they determine the total amount of funding available for special education. Broadly, state funding obligations are either (a) built up from individual components or (b) established top down from mounts appropriated in legislation. In the first instance, state funding obligations are determined using a formula that ties spending levels to the number of students with disabilities and, sometimes, the extent of student need. For FY2018, nearly all states' funding obligations were determined this way. By contrast, with top-down approaches, policymakers base the amount of state funding on past years' spending levels or some other approximation of special education costs. The stipulated amount is then distributed to LEAs using a formula.[16]

Determining State Contributions

Most states operate a categorical funding program for special education. States differ in both the amount of funding they provide (on a per child basis) and in how they determine the amount of state aid available for a particular fiscal year. That said, broadly, states use one of two approaches to determine how much state aid is available. State funding obligations are either (a) built up from individual components or (b) established top down from amounts appropriated in legislation.

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[16] A handful of states do not operate separate categorical aid programs for special education. Instead, these states incorporate funding for students with disabilities (or more generally, students with special needs) in their general education aid calculation (e.g., Connecticut and Rhode Island). In these instances, LEAs receive an overall allotment of state funding to offset the costs of their general and special education programs.

In the first instance, state funding obligations are determined using a formula that ties spending levels to the number of students with disabilities and, sometimes, the extent to student need. For FY2020, nearly all states' funding obligations were determined in this way. By contrast, with a top-down approach, policymakers stipulate an appropriation amount, usually based on the amount of state funding provided in the previous year or some other approximation for special education costs. The stipulated amount is then distributed to localities using a formula.

A handful of states do not operate separate categorical aid programs for special education and instead incorporate funding for students with disabilities (or, more generally, students with special needs) in their general education aid calculation. When this occurs, LEAs receive an overall allotment of state funding to offset the costs of their general and special education programs. Although localities typically have broad discretion in determining how dollars are spent, they are still compelled by law to ensure FAPE for students with disabilities.

Calculating State Aid Amounts

States also differ in how they determine the amount of state aid provided to an LEA for special education. Yet, despite operational differences, state funding formulas typically comprise two parts: (a) a basis on which funding is calculated and (b) the mechanisms used to determine the amounts of funds generated by the formula (Exhibit D.1). In addition, some states also operate contingency funding programs that reimburse localities for the extraordinary cost of educating students with high needs.

Exhibit D.1. Component Parts of State Aid Formulas for Special Education

Funding basis	Distribution mechanisms
Student count	Student weights or fixed-dollar grants (per student)
Resource ratios	Fixed-dollar grants (per instructional unit)
Expenditures[a]	Cost reimbursement

[a] Contingency funding programs typically use expenditures as the basis for funding and cost reimbursement as their mechanisms for allocating aid.

Funding Basis

The amount of aid provided to an LEA is tied to some basis, or primary unit, which is the starting point for a state's calculations. State aid programs can be broadly categorized according to one of three factors that serves as the basis for funding: student count, resource ratios, or special education spending.

Special Education in Ohio: Best Practices, Costs, and Policy Implications

Student Count

Most states use a count of eligible students as a starting point for determining the amount of state funding an LEA receives for special education. Generally, states use one of two approaches to counting students: (a) total head count of students (i.e., who do and do not receive special education services) who are enrolled in (or attend) an LEA or for whom an LEA has jurisdictional responsibility or (b) the number of students an LEA identifies for special education.

Head Count. A formula that links funding to the total head count of students can be further differentiated according to whether funding is determined using a census (i.e., all students) or as a stipulated percentage of the total head count (e.g., using average daily membership). In the first instance, the allocation is per capita (some amount of funding for each counted student). Alternatively, the state may provide funding for a set percentage of total head count (e.g., 13% of enrollment), such that the stipulated percentage serves as a proxy for the expected share of students eligible for special education for all LEAs in a state.

In the field, both approaches are commonly called a census-based formula because they are independent of the actual counts of students with disabilities and are based on the total head count. Whether the amount of state aid received by an LEA is calculated using a count of all students or a set percentage of students, census-based formulas are designed to provide the same amount of state aid to LEAs with identical enrollments, regardless of the number of students identified for special education, disability category, level of services and supports, or how or where students receive services.

Count of Students Eligible for Special Education. Alternatively, states may tie state aid to the number of students an LEA identifies for special education. The number may simply be the count of students receiving special education services or further differentiated according to other attributes, such as the number of students within specific disability or need-based categories, grade levels, or placements.

Some states take the additional step of capping aid at a specified percentage of the total students in a district. For instance, Washington state limited the number of funded students to 13.5% of an LEA's average daily membership. With or without a cap, state formulas that use the number of students identified for special education in their calculations are designed to account explicitly for potential differences in the prevalence of disability, and in some cases level of need, across LEAs.

Resource Ratios

Alternatively, states may provide funding based on some unit of instruction, usually operationalized in terms of a number of personnel for which the state provides funding. For

Special Education in Ohio: Best Practices, Costs, and Policy Implications

instance, some states base funding on the count of special education teachers, instructional assistants, or related services personnel who work in schools. The number of funded personnel in an LEA is typically determined using student-to-staffing ratios that are established in state statutes or regulations.

For example, in Illinois, state funding is calculated as one full-time equivalent (FTE) teacher position for every 141 students, one FTE instructional assistant for every 141 students, and one FTE school psychologist for every 1,000 students. Delaware also calculates aid using student-teacher ratios; however, the staffing ratios used to identify the number of state-funded positions vary according to both grade level and student need (e.g., basic special education, intensive special education, and complex special education).

Special Education Spending. States also may base funding on the actual amounts spent by LEAs to provide special education services and administer their special education programs. State regulations establish rules for what types and amounts of local special-education-related spending are eligible for state reimbursement.

Mechanisms for Allocating State Aid

State aid formulas for special education use different mechanisms to regulate the amount of funding an LEA receives from a state: (a) student weights, (b) fixed-dollar grants, and (c) cost reimbursement.

Student Weights. Student weights are the most common approach used by states to determine the amount of special education funding an LEA receives. Weights, single or multiple, are applied to a count of students, and the amount of state aid is determined by applying the weighted count to some base per-student funding amount, generating additional funding for an LEA.

For instance, Maryland uses a single weight of 1.74 to determine the additional state aid an LEA receives for its special education programs so that a district was funded 74% more for each student with a disability than a student with no additional needs. Similarly, Oregon used a weight (multiplier) of 2.00 per student with an IEP but capped its application at 11% of a district's enrollment.

States that use multiple weights in their calculations assign different multipliers to disability categories, tiers of need (e.g., mild, moderate, severe), student grade level, or where a student is placed (e.g., percentage of time outside the general education classroom). For example, Texas uses multiple weights tied to both the types of services a student receives and where a student receives those services.

Special Education in Ohio: Best Practices, Costs, and Policy Implications

The amount of funding generated by weights varies according to the student count to which they are applied as well as the multiplier used for the weight. There is no consensus among states as to the size of the weights used in calculations, and considerable differences exist across states in the base per-student funding levels used in the calculations. So, even when comparable weights are used across states, the actual level of funding generated by a weight can be quite different.

Fixed-Dollar Grants. Fixed-dollar grants provide LEAs with a fixed-dollar amount per fundable unit. The fundable unit depends on the basis used in the state aid calculation, but it typically is either allocated on a per student or per instructional unit basis. Fixed-dollar grants generate additional funds as do weights. However, instead of applying a weight to the count of students and then multiplying the weighted count with a per-student base to determine the funding level, the grant is a fixed-dollar amount applied to the count of students. States may use a single fixed-dollar amount (e.g., a single weight) or multiple grant amounts that correspond to different disability categories, levels of need, or placement.

As with weights, the level of funding generated by fixed-dollar grants varies according to the student count to which it is applied as well as the per-student grant amounts. However, unlike weights, fixed-dollar grants are not tied to a base per-student funding amount (which may vary year to year). Fixed grant amounts established in statute also require legislative action to adjust for changes in education costs across time. A failure to make these modifications can result in a gradual shift in cost burden to localities as the per- student cost of education increases.

Fixed-dollar grants also are used to calculate the amount of funding an LEA receives when state aid is based on resource ratios. Although states differ in the student-to-staff ratios used in their calculations, the mechanism used to determine the amount of funding provided is a fixed-dollar grant per personnel unit. Typically, the amount is to be equivalent on some average level of compensation for a particular FTE position. The compensation amount may be stipulated in a statute or established in state regulation.

Cost Reimbursement. States that use special education spending as a basis for providing aid typically reimburse LEAs for some percentage of the actual amount spent on special education services. The reimbursement mechanisms vary across states; states differ both in terms of spending and the share of local costs that are eligible for reimbursement. For instance, Wisconsin reimburses localities for 26.79% of their local spending on special education, and Michigan and Vermont provided reimbursement rates of 28.61% and 60.00%, respectively.

Contingency Funding

Students with high needs may require intensive or unique supports that can exceed normal standards for special education costs. For the most expensive (5%) of these students receiving special education services, expenditures can be as much as 5.5 to 8.7 times greater than the average spending for a general education student and 8.8 to 13.6 times larger for students in the top 1% of per-student spending (Chambers et al., 2003). Such extraordinary costs can place disproportionate financial burden on and pose differential risk to LEAs (Baker & Ramsey, 2010).

To mitigate these burdens and risks, 26 states operate contingency funding mechanisms or high-cost risk pools that reimburse LEAs for the extraordinary cost of educating students with high needs, beyond the funding received through the state's primary special education funding formula.

Two general policy models for contingency funding have emerged: (a) the state pays for a percentage of additional costs above a set spending threshold, with a cap on the total reimbursement amount, and (b) the state pays a percentage of additional costs above a set spending threshold, without a cap on reimbursement (Griffith, 2008). Some states take the additional step of limiting the total funds available for extraordinary cost reimbursement. When demand exceeds available funding, reimbursement may be prorated to a lesser amount or allocated on a first-come, first-served basis.

Fifty-State Summary

Exhibit D.2 describes the different approaches states used to provide special education funding to LEAs during FY2018. The table categorizes state formula according to (a) basis of funding (Column 2); (b) mechanism for allocating state aid (Column 3); and (c) contingency/high-cost student funding program (Column 4).

Exhibit D.2. Fifty-State Summary of State Approaches to Providing Special Education Funding to Local Education Agencies

State	Basis for funding	Mechanisms for allocating state aid	Contingency/high-cost student funding program
Alabama	Student count (stipulated percentage)	Single weight	N
Alaska	Student count (census)	Single weight[a]	Y
Arizona	Student count (SWD)	Multiple weights	N
Arkansas	Special education funding is embedded in general education formula/allocation.		Y

Special Education in Ohio: Best Practices, Costs, and Policy Implications

State	Basis for funding	Mechanisms for allocating state aid	Contingency/ high-cost student funding program
California	Student count (census)	Fixed-dollar grant	Y
Colorado	Student count (SWD)	Fixed-dollar grant	N
Connecticut	Special education funding is embedded in general education formula/allocation.		Y
Delaware	Resource ratio	Fixed-dollar grant	N
Florida	Student count (SWD)	Multiple weights	N
Georgia	Student count (SWD)	Multiple weights	N
Hawaii	Resource ratio	Fixed-dollar grant	
Idaho	Student count (stipulated %)	Fixed-dollar grant	N
Illinois	Resource ratio	Fixed-dollar grant	N
Indiana	Student count (SWD)	Fixed-dollar grant	N
Iowa	Student count (SWD)	Multiple weights	N
Kansas	Resource ratio	Fixed-dollar grant	Y
Kentucky	Student count (SWD)	Multiple weights	N
Louisiana	Student count (SWD)	Single weight	Y
Maine	Student count (SWD with Cap)	Multiple weights	Y
Maryland	Student count (SWD)	Single weight	N
Massachusetts	Student count (stipulated percentage)	Fixed-dollar grant	Y
Michigan	Expenditures	Cost reimbursement	N
Minnesota	Expenditures & student count (SWD)	Cost reimbursement & fixed-dollar grants for students in three high-need disability categories	N
Mississippi	Resource ratio	Fixed-dollar grant	N
Missouri	Student count (SWD with minimum)	Single weight	Y
Montana	Student count (stipulated percentage)	Fixed-dollar grant	N
Nebraska	Expenditures	Cost reimbursement	N
Nevada	Student count (SWD)	Multiple weights	N
New Hampshire	Student count (SWD)	Fixed-dollar grant	Y
New Jersey	Student count (stipulated percentage)	Fixed-dollar grant	Y
New Mexico	Student count (SWD)	Multiple weights	Y

State	Basis for funding	Mechanisms for allocating state aid	Contingency/ high-cost student funding program
New York	Student count (SWD)	Single weight	Y
North Carolina	Student count (SWD with cap)	Fixed-dollar grant	N
North Dakota	Student count (census)	Single weight	Y
Ohio	Student count (SWD)	Fixed-dollar grant[a]	Y
Oklahoma	Student count (SWD)	Multiple weights	N
Oregon	Student count (SWD with cap)	Single weight	Y
Pennsylvania	Districts receive funding equivalent to the amount provided by the state for FY2014. If additional state funding is appropriated, these funds are allocated using multiple weights. However, for FY2018 less than 8% of the state's funding was distributed using the weighted formula.		N
Rhode Island	Special education funding is embedded in general education formula/allocation.		Y
South Carolina	Student count (SWD)	Multiple weights	N
South Dakota	Student count (stipulated percentage)	Fixed-dollar grant	Y
Tennessee	Resource ratios	Fixed-dollar grant	N
Texas	Student count (SWD)	Multiple weights	N
Utah	Student count (SWD with cap)	Fixed-dollar grant	Y
Vermont	Expenditures	Cost reimbursement	Y
Virginia	Resource ratios	Fixed-dollar grant	N
Washington	Student count (SWD with cap)	Single weight	Y
West Virginia	Student count (SWD)/expenditures	Fixed-dollar grant/ cost reimbursement	Y
Wisconsin	Expenditures	Cost reimbursement	Y
Wyoming	Expenditures	Cost reimbursement	N

Note. SWD = students with disabilities. States periodically revise their special education funding formulas. This exhibit summarizes state approaches in place for FY2018. The profile draws from three sources that independently catalogue state education funding policies: (a) Education Commission for the States (2019), (b) EdBuild (n.d.), and (c) Verstegen (2018).

[a] Ohio implemented a multiple weight formula in the 2021–22 school year.

[b] Alaska applies a single weight to a district's total head count to provide funding for students with special needs, which is inclusive of but not limited to students with disabilities.

Aligning State Special Education Funding Formula With Practice Goals

There is no such thing as the "one best" approach to designing and implementing a state's special education funding formula. Rather, a state's formula should align with its goals for local special education programs while also recognizing that local educators view state special education funding with their own financial interests in mind. This complex interplay among policy and practice goals, state funding systems, and local decision making underscores the need for three considerations when designing policy:

25. The relationship between local special education programs and their cost

26. The motivational effects of the design elements included in the formula

27. Administrative efficiency (Hartman, 1980, 1992; Kolbe, 2021; Parrish, 1994; Exhibit D.3).

Exhibit D.3. Design and Evaluation Considerations for State Special Education Funding Formula

Consideration	Standard
Cost considerations	
Cost-based	• State aid is tied to the local cost of providing special education and related services to students with disabilities.
Equity	• State aid is distributed in ways that ensure students with disabilities access comparable programs and services, regardless of where a student lives. • All districts receive comparable resources for comparable students. • State aid is adjusted to account for differences in local tax capacity/wealth.
Motivational effects	
Identification	• The number of students eligible for special education is not the primary basis for determining the amount of state aid an LEA receives. • State aid is not linked to specific disability categories.
Placement	• State aid is not linked to a specific type of educational placement for students with disabilities. • State aid for special education programs does not preclude local efforts to provide early intervention and services for students, prior to being identified for special education.
Service delivery	• Encourages appropriate educational programming and practices for students with disabilities. • Promotes unified system of supports and services between general and special education and other categorical programs (e.g., English learners).
Comprehensiveness	• Includes all students with disabilities and funding for services and supports appropriate to their needs.

Special Education in Ohio: Best Practices, Costs, and Policy Implications

Consideration	Standard
Administrative efficiency	
Transparency	• The policy objectives underlying the formula are clearly articulated and understandable by key stakeholders (e.g., legislators, state department personnel, LEAs, and advocacy groups). • Expectations for the state and local share of special education costs are stated and understood by state and local policymakers. • The special education funding formula should have clear conceptual links to the state's general education funding formula.
Predictability	• The state formula generates predictable revenues to support local special education programs from year to year. • State annual appropriation amounts are predictable from year to year.
Flexibility	• The state formula is flexible enough to allow LEAs to respond to unique local conditions, as appropriate per current state law and regulations for special education programs. • LEAs have latitude to use state and local funding in ways that promote the best possible outcomes for students with disabilities.
Burden	• Costs of administering the funding system are minimized at state and local levels. • Data requirements, record keeping, and reporting are limited to what is necessary and reasonable.
Accountability and cost-effectiveness	• Procedures are in place to contain excessive or inappropriate spending by LEAs. • State aid enables or promotes LEAs' use of cost-effective practices when serving students with disabilities.

Note. LEA = local education agency. Design considerations adapt and expand on criteria originally proposed by Hartman (1992), Kolbe (2021), and Parrish (1994).

Cost Considerations

A state's funding formula should be evaluated according to whether it provides sufficient funding for local educators to implement programs and practices aligned with state performance goals. State aid calculations should be informed by (a) an understanding of what special education should cost, given existing policy goals for local programs and practices, and (b) a locality's capacity to pay for the cost of ensuring FAPE for its students with disabilities.

Practically, this suggests that state funding for special education should be "cost based" (i.e., tied to established standards for the types and amounts of resources required to implement effective special education programs). For example, fixed grant amounts that do not account for key cost factors related to differences in per-student costs associated with levels of student

Special Education in Ohio: Best Practices, Costs, and Policy Implications

need or personnel unit costs between localities will offset larger and smaller shares of local costs, depending on local context.

Sufficiency in funding does not imply that the state must fully fund local special education programs. State policymakers must first determine what the state contribution should be as a share of total special education spending.

First, policymakers must determine the level of state funding that will ensure localities can provide FAPE for their children with disabilities without crowding out spending on other necessary education expenditures (e.g., general education programming; Hartman, 1992; Kolbe, 2021; Parrish, 1994). In many ways, this is a normative policy question. The answer is steeped in a state's values and political climate.

There is considerable variability in the share of special education costs paid by states. No state fully funds special education expenditures that are not otherwise paid for with federal dollars. Rather, state aid as a share of local expenses falls on a continuum from some minimal contribution to more than 90% of the costs. For example, Arkansas pays for only a portion of the services provided to the costliest children with disabilities, whereas Vermont reimburses districts an average of 60% of their total special education spending. California's block grant formula covers, on average, about 31% of local special education costs.

A second related consideration is the extent to which a state's aid calculation should adjust for differences in LEA wealth (Hartman, 1992; Kakalik, 1979; Kolbe, 2021; O'Reilly, 1989). A critical goal for state special education policy is to ensure student access to special education, and the quality of supports and services a student receives should be independent of the district's wealth in which a student resides. Simply providing the same funding to each LEA (e.g., through a fixed grant amount) may be fiscally inequitable with lower-wealth districts facing a higher price for the tax dollars they must raise to pay for the excess cost of special education. State aid for general education programs typically has an equalizing component that provides more funding to low- versus high-wealth districts.

Motivational Effects
Equally important to how much state aid should be provided are the motivational effects that underlie the ways states allocate aid to localities. States can choose from different mechanisms to allocate the same amount of state funding to a particular LEA. A key consideration is the extent to which the incentives and disincentives inherent in a particular policy design align with other state goals for local special education programs and practices (Exhibit D.4).

Special Education in Ohio: Best Practices, Costs, and Policy Implications

Exhibit D.4. Motivational Effects of Funding Bases and Mechanisms Used in State Special Education Aid Calculations

	Potential motivational effects
Funding basis	
Student count: Total number of students	• Removes fiscal incentives to overidentify students for special education because state aid is not based on the number or types of students who receive special education or related services in a district. When combined with a per-student block grant, it may encourage flexibility in spending, including early intervening services.
Student count: Students with disabilities	• Provides fiscal incentives to identify students for special education because the amount of aid that a local educational agency (LEA) receives is tied to the number of students identified by an LEA.
Resource ratios	• Ratios that generate too little state aid per student may incentivize local educators to limit or ration the amounts and types of services provided to students with disabilities. • Ratios tied to the number of students identified for special education or specific placements (e.g., separate classroom or special educator) may motivate local educators to classify or place a student in a way that generates more state aid. • Ratios tied to class size may incentivize LEAs to minimize class sizes and qualify for the maximum number of reimbursable units, or preference utilization units associated with higher levels of state aid.
Expenditures	• Creates incentives to maximize special education-related spending. • Narrow definitions of allowable expenditures can create incentives to compartmentalize special education programs and can work against efforts to integrate general and special education programs and services.
Funding mechanism	
Student weights/ fixed-dollar grants	• Weights or fixed-dollar amounts that generate too little state aid per student may incentivize local educators to limit or ration the amounts and types of services provided to students with disabilities. • Single weights or a fixed-dollar allocation may encourage local educators to provide fewer or lower cost supports and services. • When state policy includes multiple weights or fixed-dollar grants that correspond to different disability classifications or placements, local educators may be motivated to classify or place a student in a way that generates more state aid (i.e., through larger weights or fixed-dollar allocations).
Cost reimbursement	• Reimbursement percentages that yield too little state aid per student may incentivize local educators to limit or ration the amounts and types of services provided to students with disabilities. • Higher levels of reimbursement may make local educators less sensitive to the cost of providing special education and related services and, as a result, encourage overidentification, more services, or higher cost services or placements.

Potential motivational effects
• Restrictive state definitions of what constitutes reimbursable (allowable) special education spending may encourage local educators to operate distinct special and general education programs, resulting in barriers to implementing unified systems of support and early intervening services to students prior to being identified for special education.

Contingency funding	
Extraordinary cost reimbursement	• Spending thresholds that determine eligibility for extraordinary cost reimbursement may incentivize local educators to provide higher levels or more costly services (including out-of-district placements) to qualify for additional state aid.

Note. Sourced from Hartman (1992), Kolbe (2021), Mahitivanichcha and Parrish (2005), and Parrish (1994).

For instance, state aid allocations can be evaluated according to how they might influence local decisions to (a) identify students with disabilities, including assignment of a primary disability classification, and (b) decide where students are educated. State funding formulas can be evaluated for whether they enable or constrain local educators' efforts to respond to state policy priorities for service delivery and systemic change.

All state funding contains motivational effects that influence local decision making. For example, LEAs may engage in revenue-seeking behaviors by identifying more students for special education when funding is tied to the number of students receiving special education in a district, the label given to a student, and where a student is placed. Conversely, census-based mechanisms may disincentive special education identification.

Exhibit 21 describes potential motivational effects associated with the different funding bases and units of allocation in state aid calculations. The potential influence of a particular basis cannot be isolated from a formula's other component parts. For instance, a state formula that uses a census count of students as a unit for allocating may discourage local educators from overidentifying students for special education, and when paired with a fixed-dollar grant amount that will be the same regardless of the level of service provided, the fiscal incentive also may be to provide fewer or lower cost services to students eligible for special education.

State funding formulas can send conflicting messages to local educators about state goals for special education programs and practices, which asks LEAs to do one thing while receiving financial encouragement to do another. Local educators may need to prioritize inclusionary practices but receive higher levels of state aid for placing students in more restrictive settings (Parrish, 1994). Similarly, efforts to implement special education reforms, particularly new flexible service delivery models and tiered systems of support, can clash with state funding

policies based on a different set of assumptions about identifiable students, measurable program standards, distinct supports and services, and auditable expenditures (Hartman, 1980; McLaughlin et al., 2013; Sparks, 2011; Voulgarides, 2018). For instance, in a study of special education funding in Vermont, researchers found that the state's long-standing cost reimbursement formula incentivized local educators to compartmentalize programs and services for students with disabilities apart from general education programming (Kolbe & Killeen, 2017). These unintended consequences undermined the state's other policy initiatives to encourage districts and schools to implement multitiered systems of support as well as early intervening supports and services for students who are struggling.

Administrative Efficiency

State funding formulas can be evaluated on their administrative efficiency (Hartman, 1992; Kolbe, 2021; Parrish, 1994). State aid calculations should be transparent and understandable by both state and local policymakers. Funding levels should be predictable. State policymakers should be able to accurately estimate annual appropriations and districts should be able to budget for state revenues. Both state and local decision makers should be able to track revenues and spending for cost accounting. Administrative burden—to both states and localities—also should be considered, as are data, record-keeping, and reporting requirements.

Summary of State Funding

State aid for local special education programs is an integral part of states' overall special education policy systems, and all states provide some amount of additional funding to LEAs to pay for what is spent for special education services.

The existing policy landscape comprises 50 distinct state-specific approaches to allocating state aid. Even though each state policy is unique, they share common attributes with respect to (a) how the state contribution is determined and (b) the mechanisms used to distribute funding to localities.

There is no "one best" approach to designing and implementing a state's special education funding formula. Rather, a state's formula should align with its goals for special education programs and practices, while also recognizing that local educators view state special education funding with their own financial interests in mind.

When designing a state special education funding formula policymakers should consider (a) the cost of ensuring FAPE for students with disabilities; (b) the share of special education costs that will be paid for by the state; (c) the extent to which a state's aid calculation will account for differences in local wealth; (d) the motivational effects that underlie different bases and mechanisms in the funding formula; and (e) administrative efficiency.

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