The Assistive Technology Infusion Project (ATIP) was developed to distribute $9.3 million dollars of assistive technology to students with disabilities in Ohio schools and measure the outcomes. This article describes the two-year start-up period of the project and highlights key procedural aspects of the program's implementation. The project developed several web-based protocols, including announcing the availability of funding, managing electronically submitted grant proposals, conducting a peer review process, and managing the provision of awards. Lessons learned in the process of implementing the ATIP are summarized to assist others in replicating the procedures on either a larger or a smaller scale.

K-12 schools have been involved in the provision of assistive technology devices and services for a long time. Federal legislation, such as the Technology-Related Assistance for Individuals with Disabilities Act (1988), the Assistive Technology Act of 1998, the 1997 reauthorization of the Individuals with Disabilities Education Act, and the Individuals with Disabilities Education Improvement Act of 2004, highlights the value of assistive technology and the responsibility of schools to meet children's needs for a free, appropriate public education through the provision of assistive technology. The importance of assistive technology for students with disabilities is emphasized by the requirement to consider the need for assistive technology for each student with an individualized education program (IDEA, 1997).

As in other service delivery settings, the need to measure the outcomes of assistive technology is becoming increasingly important in the schools. For example, Project OATS examined the measurement of assistive technology in the schools, and included the development of a modified version of the School Function Assessment (SFA-AT) for the purpose of helping teams measure the impact of assistive technology (Coster, DeKeyser, Haltiwanger, & Haley, 1998; Silverman, Stratman, & Smith, 2000). To promote measuring the effectiveness of assistive technology, Reed, Bowser, and Korsten (2002) encouraged the educational community to think through...
the data collection process in their book *How Do You Know It? How Can You Show It? Making Assistive Technology Decisions*. Although practitioners and administrators recognize the need to measure assistive technology outcomes to promote best practice, analyze cost benefit, and facilitate budget planning, few schools or districts are measuring the effectiveness of assistive technology interventions (Silverman et al., 2000). Gelderblom and de Witte (2002) identified additional reasons for measuring outcomes, including the pressure to economize, and the political and economic call to rationalize the resources spent on assistive technology. Fuhrer (2001) identified the need to establish the effectiveness of assistive technology over time and to steer the development of new assistive technology.

Statewide planning for students with disabilities created a unique opportunity to measure outcomes in the state of Ohio as policymakers chose to elevate funding for assistive technology to a level commensurate with other statewide technology implementation efforts. Based on public hearings conducted through the Ohio Department of Education’s State Improvement Grant and a study conducted by the Ohio Coalition for the Education of Children with Disabilities, funding for assistive technology devices and services was determined to be a high priority. In June of 2001, the Ohio Department of Education received a 36 million dollar federal grant from the United States Department of Education School Improvement Grant, IDEA, and Technology Grants, of which 9.3 million dollars were used to assist districts in providing assistive technology devices for students with disabilities and to measure the impact of the technology on critical variables.

This article highlights the two-year start-up period of the Ohio Assistive Technology Infusion Project (ATIP). We focus on the procedural aspects of the ATIP, including announcing the availability of funding, managing an electronic grant proposal submission process, developing a peer review process, and managing the awards, in order to assist others interested in replicating the procedures. We conclude with a summary of the lessons learned and a description of the on-going process of data collection associated with the research questions on the outcomes of assistive technology.

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**Process and Procedures**

**Planning**

Upon receiving notification of the grant, the Ohio Department of Education Office for Exceptional Children established a management and implementation partnership with the Ohio Resource Center for Low Incidence and Severely Handicapped (ORCLISH) and the Ohio SchoolNet Commission. In addition, an advisory board was established. The collaborating agencies developed a process by which local educational agencies had an opportunity to apply for funds for the purchase of specific assistive devices for individual students. The devices were provided based on an assessment by local school personnel and according to the student’s individualized education program (IEP) or Individual Family Service Plan. Districts were responsible for assistive technology services (evaluation, training, repair, and maintenance) as part of their local contribution.

The design of the project facilitated the development of assessment skills by school teams by requiring them to complete the steps of an assessment in order to apply for funding. The process also encouraged greater awareness at the district level of the need to carefully consider the provision of assistive technology devices and services to students with disabilities. Within the field of assistive technology, there is a recognized need to study the outcomes of assistive technology in the school settings (Edyburn, 2003; Reed et al., 2002; Smith, 2000). The designers of the ATIP seized the opportunity to study the impact of the project, including the outcome of assistive technology devices for the individual students. To make the most of this opportunity, the ATIP staff collaborated with the ATOMS (Assistive Technology Outcomes Measurement System) Project. The ATOMS Project is funded by the United States Department of Education National Institute on Disability Related Research as a five-year project to systematically explore, pilot, and test assistive technology outcome measurement ideas in an effort to recommend the next-generation outcome system for assistive technology. The partnership between ATIP and ATOMS created a unique opportunity to study both quantitative and qualitative data related to the provision of assistive technology in the schools. (Further information about the Ohio ATIP may be found at http://www.r2d2.uwm.edu/atoms/archive/technicalreports/tr-atip.
pdf and information about the ATOMS Project can be found at http://www.r2d2.uwm.edu/atoms/about/).

An overview of the process designed by the collaborating agencies of the Ohio Department of Education to infuse assistive technology into the Ohio public schools is illustrated in Figure 1, with additional descriptive detail provided below. The process was designed to promote best practices related to the selection of assistive technology and to support access and progress in general education.

**Disseminating the Call for Proposals**

Informing schools about the opportunity to apply for funds for assistive technology through ATIP was an essential first step to meeting students’ needs. A variety of methods were used to disseminate the call for proposals, including (a) electronic distribution lists to superintendents, technology coordinators, supervisors of special education programs, and principals; (b) electronic monthly newsletters of the Ohio SchoolNet Commission; (c) the print newsletter of the Ohio Department of Education; (d) the print newsletter of the Ohio Coalition for the Education of Children with Disabilities; (e) the print newsletter and listservs of the sixteen Special Education Regional Resource Centers; (f) print brochures; (g) four web sites; and (h) dissemination of information at state and regional conferences and meetings.

The information included the purpose and parameters of the project, the site for the online application form and deadlines, and information about training opportunities, and technology resource and vendor support. Because funding awards were to be made in four phases, four deadlines were established between late 2001 to mid 2003.

**Online Application**

To apply for assistive technology funding through the ATIP, school district personnel were required to complete an online application. The ATIP application served the purpose of guiding the participants through an assistive technology assessment. Team members answered a series of questions that align with the IEP process concerning students’ present level of performance and justify the need for the assistive technology. The assessment process included the same major components as the SETT framework (Zabala, 2002) and Educational Tech Points (Bowser & Reed, 1998). Table 1 provides a summary list of the information that teams provided as a part of the application.

For staff who were new to assistive technology assessment, resources were provided to assist them in the process. Help menus and instructions were embedded within the online application. Teams were directed to online courses in assistive technology that were being offered through Ohio’s Assistive Technology Distance Learning Project, including such classes as “Assistive Technology Fundamentals,” “Augmentative Communication Assessment,” and “Instruments and Strategies for Data Gathering.”

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<th>General Information</th>
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<td>Student identification information</td>
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<td>Student’s disability</td>
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<td>District information</td>
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<td>Building contact</td>
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<th>Problem Identification</th>
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<td>Present level of performance</td>
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<td>Statement of critical need</td>
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<td>Past/current accommodation and modifications</td>
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<td>Continuum of options and trial use</td>
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<th>Solution Selection</th>
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<td>Assistive technology requested</td>
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<td>Goal setting</td>
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<td>Evaluation plan</td>
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<td>Team members and responsibilities</td>
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<th>Local Share</th>
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<td>Supports and services</td>
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<th>Significance</th>
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<td>District impact</td>
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<td>Access to general curriculum</td>
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Table 1

Summary List of Information Gathered on the Assistive Technology Infusion Project Online Application
Flow chart of the Assistive Technology Infusion Project process

Flow Chart of the ATIP Process
Completed for Each Round of Applications

1. Information Disseminated to Schools
2. Applicants select target child and complete online*
   - Training and resources provided to support individuals completing applications
   - Review committees review applications
   - Application requires teams to complete an AT assessment as part of IEP
   - Applicants notified of intent to fund
   - Applicants notified that request was denied; encouraged to reapply
3. Pre-Intervention
   - Districts complete AT District Profile
   - Teams complete Student Performance Profile
   - Teams send a copy of student’s IEP to the ATIP
4. Purchase AT and implement plan with student
5. Post-Intervention (8 months to 1 year after purchase of device)
   - Districts complete AT District Profile
   - Teams complete Follow-up Student Performance Profile-Survey of Contact Person

(For more information regarding these training opportunities, visit the web site at http://www.etech.ohio.gov/programs/elearning/assistive/index.jsp) In addition, technical support was offered to applicants through the Special Education Regional Resource Center or the local Educational Service Centers. To aid Ohio ATIP participants in gaining information on assistive technology products, the project provided links to vendor web sites and also offered vendors the opportunity to provide online “Video Spotlights” as a method of providing information to participants.
Review of Applications

Once the applications had been collected for each round of the ATIP, one or more two-day statewide grant reviews were held. Reviewers solicited from the field to create a pool of reviewers included professionals in both general and special education, many of them with expertise in assistive technology. Following a training session, each reviewer scored a sample application to calibrate his or her scoring in order to adjust for some reviewers being tougher than others. The reviewers then began to score the grant applications using a scoring rubric, with responses recorded on a computerized answer sheet (bubble sheet). Each item of the rubric correlated with a section of the application. Table 2 illustrates one item from the 16-item rubric. Reviewers also wrote qualitative comments regarding the applications.

The process was designed such that three reviewers with varied backgrounds read each grant application, with at least one person having expertise in the student’s area of need (e.g., a speech therapist would review each grant related to a communication need). To increase the validity of the scores, the applications were also randomly distributed to groups of reviewers with appropriate expertise. For each round of applications, approximately 95 reviewers participated in the review process. For grants over $3001, a consensus process was used, in which reviewers scored the grants individually and then an expert facilitator conducted a discussion to assure that the reviewers agreed on the scoring. The facilitator also recorded the consensus comments, which were later reviewed by project staff to make certain that they were appropriate and helpful to the applicants.

To make a final determination, certain questions were weighted more heavily to reflect their importance. For example, evidence of parental involvement in the implementation plan was given greater weight because this is considered essential for proper planning and training in device use. In addition, documentation of a successful trial period was given more weight because this provides the data necessary to demonstrate that the student is able to use the technology effectively. Districts were also awarded points based on their level of financial need. The cutoff point (i.e., threshold for funding) was determined through statistical analysis to ensure the reliability of the scores, as well as equity in the distribution of the awards.

Table 2

<table>
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<tr>
<th>Score</th>
<th>Description</th>
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<tr>
<td>1</td>
<td>No evidence is provided that other technology options were considered. No justification is provided for not considering other options. No trial use or simulation was conducted.</td>
</tr>
<tr>
<td>2</td>
<td>No evidence is provided that other technology options were considered; minimal justification is provided as to why only this assistive technology was considered. No trial use or simulation was conducted.</td>
</tr>
<tr>
<td>3</td>
<td>Provides evidence that at least one other technology was considered. Minimal justification is provided as to why this technology is best for the student. Trial use or simulation assessment was conducted, but results are unclear.</td>
</tr>
<tr>
<td>4</td>
<td>A continuum of several options was considered with minimal justification on the system that is best for the student. Trial use or simulation assessment was conducted, but results are unclear.</td>
</tr>
<tr>
<td>5</td>
<td>A continuum of several options was considered with basic justification on the system that is best for this student. Trial use or simulation assessment was conducted, but results are unclear.</td>
</tr>
<tr>
<td>6</td>
<td>A continuum of several options, including those that are comparable, was considered with clear justification on the system that is best for this student. Realistic trial use or simulation was conducted with clear results.</td>
</tr>
</tbody>
</table>

Note. This rubric item relates to the ATIP application section related to solution generation “List the assistive technologies that were considered in meeting the student needs identified in this assistive technology process. Indicate trial use, duration, and results. If no trial period was implemented, please explain.”

Notification

A listed contact person, the building contact, and the superintendent were notified of either a denial or the intent to fund a request. Districts that did not receive awards received written feedback regarding the application’s strengths and weaknesses and were encouraged to follow-up with their local Special Education Regional Resource Center or Educational Service Center for technical assistance in resubmitting their applications in a later round.
Applicants who failed to include the student and/or parent in the assessment process and those that did not complete a trial with the requested technology were unlikely to have their grant request approved.

For grant requests that were approved, applicants were required to provide a copy of the IEP to the ATIP project, complete an online AT District Profile and an online Student Performance Profile (pre-intervention), and submit a signed copy of a financial assurances document. The IEP copy was required for teams to demonstrate that they had recorded assistive technology in the IEP document according to the Model Policies and Procedures for the Education of Children with Disabilities (2000, p. 337-340). A description of each of the data collection instruments follows.

**The AT District Profile**

The AT District Profile is an online data-collection instrument designed to measure the impact of ATIP on the delivery of assistive technology devices and services in Ohio’s schools. The instrument is divided into two sections, one focusing on services and the other on devices. Part one presented a self-assessment of best practices under the following headings: procedural guidelines, planning and budgeting, student need, qualitative evaluations, planning, training, and management and repair. Part two consisted of an equipment inventory for various categories of devices as well as documentation of resources used to acquire devices.

Each district was required to complete an AT District Profile the first time an ATIP grant was awarded. In addition to establishing a baseline of assistive technology services and devices, the Profile provided a summary of the acquisition, implementation, and utilization of assistive technology in Ohio. At the end of the project a follow-up profile (Post) was completed. The combined data provided a means to guide the state in future policy and resource decisions concerning assistive technology infrastructure, deployment, and professional development initiatives. In addition, local districts would be able use the data to support their technology planning and to assess local implementation of assistive technology.

**Student Performance Profile**

School teams completed the Student Performance Profile (see Table 3 for a summary) prior to using devices obtained with ATIP funding, and again as a follow-up measure eight months to one year later. The Student Performance Profile provides a way to begin analyzing student outcomes resulting from the provision of assistive technology in the schools. In the absence of outcome measurement instruments tailored to widespread use in the school setting, the profile was designed to begin examining important factors that impact educational progress with assistive technology. All funded technology must directly support the student’s IEP goals, and the rate of progress on these goals must be documented on the Student Performance Profile. The impact of assistive technology on access and progress in general education is also assessed.

Smith (2000) highlighted the importance of teasing out the impact of assistive technology from the many other interventions that the student is receiving in the school setting. Christiansen and Smith identified six general approaches to improving performance of individuals with disabilities: (a) remediate the impairment, (b) teach the individual to compensate for the impairment, (c) provide assistive technology, (d) redesign the activity, (e) redesign the environment, and (f) use a personal assistant (Christiansen, 1991; Smith, 1991, 1993; Smith, Benge, & Hall, 1994). These were later expanded to include the pre-intervention approaches of health promotion and universal design (Smith, 2000, 2002).

By adapting and expanding the intervention approaches to address the specific needs of the educational setting, the framework for the Student Performance Profile was developed. The Student Performance Profile identifies 10 factors that may make a contribution to goal achievement for students: (a) natural development, (b) compensation for impairment by the student, (c) adaptations of specific curricular tasks, (d) redesign of instructional environment, (e) performance expectations changed, (f) participation in general education instruction, (g) related and support services, (h) personal assistance, (i) assistive technology devices, and (j) assistive technology services. The Student Performance Profile attempts to identify the unique contribution of assistive technology by requesting teams to rate, on a scale of zero to ten, the contribution of various interventions toward a student’s progress.
in the area of need supported by the assistive technology (see Figure 2). By rating the contribution of the different interventions, the teams are beginning to determine the unique contribution that assistive technology is making to the students’ progress.
Results

Analysis of data from the first 18 months of implementation indicates that the grant program equitably distributed assistive technology to students with disabilities across the state of Ohio, funding applications from more than 525 districts. In the four rounds of funding, 4,979 applications were received and 3,479, or nearly 70%, were funded. A summary of the grants awarded in the first four rounds is presented in Table 4.

A requirement of the ATIP process was that requests for assistive technology devices for an individual student total over $100. The average amount for grants awarded at Level 1 ($3000 and under) was $1,594, and the average for those at Level 2 (over $3000) was $6,200. The widespread application for funding by teams across the state of Ohio indicates that the Internet was effective for large-scale data collection. Of the 1,725 contact persons who have responded to the Student Performance Profile-Post and completed the Contact Person Survey, 885 indicated that they “strongly agree” and 682 indicated that they “agree” that the effort to complete the grant process was “well worth the time and effort” to obtain the assistive technology for their students (see Figure 3).

Descriptive Analysis of Applications and Awards

Applications for assistive technology were received for 3,310 males, with 2,311 receiving awards, and for 1,669 females, with 1,168 receiving awards. Although all potential ages and grades were represented, the number of applications received began to steadily decline beginning at grade 6. Figure 4 provides additional details on the distribution of awards by grade level.
Across all disability groups, those applying for grants were equally successful; the percentage of applicants who received awards was similar across all disability groups. However, the frequency of requests for ATIP funding did not coincide with the frequency of occurrence of the various disabilities in the school population. Some disabilities requested more assistive technology than would be expected based purely on the incidence of the disability in the schools, and others were less likely to request technology.

The pattern of applying for technology is not surprising, given the needs of students with various disabilities and the traditional pattern of assistive technology provision and use in the schools. In the past, assistive technology had been provided primarily to students with physical and sensory impairments, and moderate or severe needs (Edyburn, 2000). Disability areas that received more assistive technology funding than would have been expected based simply on the occurrence within the population of students with disabilities included students with visual impairments, hearing impairments, orthopedic impairments, multiple disabilities, and autism. Students with deaf-blindness and traumatic brain injury also fell into this group; however, the low incidence of these populations makes the differences less apparent. On the other hand, students with specific learning disabilities, serious emotional disturbances, speech and language impairments, and developmental disabilities received less technology than would have been expected based purely on the incidence of these disability groups within the population of students with disabilities served in Ohio. Figure 5 provides a summary of applications submitted and awarded by disability and Figure 6 offers a comparison to the incidence of the various disabilities in the state of Ohio to the number of awards that were granted.

### Discussion

#### Web-Based Data Collection

This project demonstrates the success of a large-scale web-based data-collection system. Although the use of the Internet to gather information is becoming increasingly common in business and government, it is less frequently used in education. Several benefits were achieved by using the Internet to administer the grant. Although constructing web-based materials requires greater expertise than constructing paper forms, a cost reduction is achieved by reducing variable costs, or costs per form, associated with printing paper copies and distributing them across the state (Cobanoglu, Warde, & Moreo, 2001). The forms were readily available to anyone with Internet access, which is available in all Ohio’s public schools. In addition, completing forms electronically allowed participants to edit their applications and return to the partially completed forms at any point prior to submission. Further, the use of the Internet meant that the electronic...
forms were readily accessible for use with electronic reading and writing tools. For the administrators of the ATIP, having the data in an electronic format facilitated tracking and retrieving information on the nearly 5,000 applications received. Because the information is electronic, a large amount of data is available for analysis by both the ATIP and the ATOMS Project personnel.

**Decline in Applications for Higher Grades**

As mentioned, a steady decline in the number of submitted applications began at grade 6 and continued through grade 12. Although the reason for the decline is not clear, possible explanations should be considered. First, the decline could indicate that the older students’ needs for technology had been addressed. Because they had attended school for more years, it is possible that the required equipment already had been procured from other funding sources prior to the ATIP. However, it is also possible that the teams supporting older students assumed that if technology would have helped the students, it would have already have been identified. Therefore, they might have been less rigorous in considering assistive technology for the student. In this case, the needs of older students were not necessarily being met. A third explanation involves differences between the elementary schools and the middle and high schools levels that impacted the likelihood that an application would be completed. For example, the amount of training provided and the amount of support available from professionals knowledgeable about assistive technology could vary by grade level. Or, as students progress through their school careers, the teachers become less optimistic about the potential benefits of the technology and, therefore, they were less likely to complete an application for older students. Further research into the factors that impact this trend should be explored to ascertain whether the needs of older students are indeed being met, or whether a need for improved services exists to specifically address the needs of older students.

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**Summary of responses to the statement, “From the team’s perspective, completing the grant process to obtain this student’s assistive technology was well worth the time and effort.”**

![Figure 3](chart.png)
Future Data Analysis

Because the ATIP application, the ATIP Student Performance Profile, and the AT District Profile were all completed online, a vast amount of data has been collected, with more to come as additional post-intervention measures are completed. These data can be analyzed for a variety of purposes. First, data can be used to provide a summary of the impact of assistive technology on student performance. From the perspective of a student’s team, the impact of assistive technology on the student’s educational performance can be examined relative to the other interventions that the student received during the same time period. No identifying information is collected using the electronic forms, so only the person completing the forms can match the information to a specific student. However, data can be aggregated to examine variables that contribute positively to outcomes for groups of students. For example, we can examine a group of students who all received a particular type of device in an attempt to determine why the intervention was successful for some students and not for others. Another possibility is to examine the data on students for whom assistive technology made a major contribution to progress to determine what these students have in common. Because of the wealth of information collected, there is great potential for examining the impact of assistive technology on students’ educational performance from a variety of perspectives and using a number of different approaches.

Second, data can be analyzed for the purpose of assessing and supporting local implementation of assistive technology. The AT District Profile lends itself particularly well to this purpose, by encouraging school districts to examine their own practices and policies relative to assistive technology. It provides a mechanism for tracking improvement over time by requiring districts to complete the profile at repeated intervals. In addition, the data can be used to analyze the impact that a particular variable
had on the implementation of assistive technology. For example, are there differences in the implementation of assistive technology between districts that have a strong systemic training program in place, compared to those that are lacking training programs for staff, students, and parents? Analysis of the data could be used as a support for local districts. By demonstrating positive outcomes from the provision of assistive technology, local districts are able to justify expenditures for devices and services that result in successful outcomes for students.

Third, the data can be used to guide policymakers at a variety of levels concerning assistive technology infrastructure, deployment, and professional development. Successful outcomes are important to justify the expenditure of money for both devices and services. By demonstrating which assistive technologies are effective, policymakers will have a clearer understanding of practices that should be promoted and funded.

Fourth, analyzing what was funded through the grant provides an opportunity to examine other potential funding sources and to investigate why those sources have not been tapped by the participants. The ATIP application asks applicants to “List funding sources, other than ATIP, that have been considered or pursued for this student.” For those requesting less than $3,000, this section was optional. A list of alternatives funding sources was provided including Medicaid, personal insurance, and the Ohio Department of Health. Applicants document the results or an explanation of their attempts to pursue other sources. This information may provide helpful information about assistive technology funding mechanisms, responsibilities, and procedures that impact school age students.

Fifth, the data can be used to inform the development of an assistive technology outcomes measurement system. The Ohio ATIP represents an initial attempt at a large-scale outcomes tracking system in the public schools. This model, or a variation of it, could be expanded to public schools in other states, or to other service delivery settings.
Figure 6

Percent of applications awarded by disability and the incidence of each disability in Ohio public schools

Guiding Decisions and Promoting Change

Love (2002) highlighted 10 ways to use data to guide decisions and promote change. The potential use for the data being collected in the schools of Ohio will be explored using nine of Love's “top 10” list as a framework.

1. “Data can uncover problems that might otherwise remain invisible” (Love, 2002, p. 28). Part of the excitement in collecting and analyzing the Ohio ATIP data is that we don’t know what we will find. For certain technologies, the advantage to the user seems obvious (Fuhrer, 1999); yet, collecting data
on a large scale provides an opportunity to examine our assumptions about which AT devices and services work in the educational setting and why. We have the opportunity to take a fresh look and examine the data from a variety of perspectives, and may indeed uncover problems that have been left unexamined.

2. “Data can convince people of the need for change” (Love, 2002, p. 28). Love pointed out that compelling data can “stop people in their tracks, break through their denial, and motivate change” (p. 28). With the IDEA requirement to consider the need for assistive technology, many teachers, therapists, and parents are now required to think about assistive technology and how it might benefit students with disabilities. Because this is a change for many, data could be a factor that will convince them of the value of assistive technology and the need to consider assistive technology seriously. Data should provide us with the evidence we need to provide effective services and, in some cases, may spur us to make important changes.

3. “Data can confirm or discredit assumptions about students and school practices” (Love, 2002, p. 28). Examining our assumptions based on data should assist us in building evidence for assistive technology practice. Because we lag behind other areas in building support for our practice, it is important to either verify or refute our commonly held beliefs about what works and what doesn’t. In so doing, we build support for our field while improving student outcomes through the use of effective practices.

4. “Data can get to the root cause of problems, pinpoint areas where change is most needed, and guide our resource allocation” (Love, 2002, p. 29). In a time of fiscal restraint and budget deficits, containing costs associated with ineffective practices is particularly important. Therefore, identifying the factors that interfere with successful assistive technology outcomes is essential. Data can then be used as a guide for policymakers as they decide which AT devices and services are most effective and should receive continued or expanded support, and which may require re-examination or reallocation of funds.

5. “Data can help schools evaluate program effectiveness and keep the focus on student learning results” (Love, 2002, p. 29). In the school setting, assistive technology is one of a variety of services and interventions that students receive in an effort to provide them with a free, appropriate public education. By analyzing the data on assistive technology as well as other interventions used to assist the child, the state and individual districts are better able to evaluate the effectiveness of their assistive technology programs. The AT District Profile provides one method for examining services at a broader level.

6. “Data can provide the feedback teachers and administrators need to keep going and stay on course” (Love, 2002, p. 29). In addition to providing a source of feedback regarding the effectiveness of services, data can show the need for redirection when services are getting off track. When progress is slow or when teams are facing barriers, energizing can be important. Implementation of assistive technology can be very time and labor intensive. Without feedback about the impact of the technology and services provided, a practitioner could become discouraged, particularly when he or she does not regularly observe the person using the technology. As Love noted, “Data about results can energize and empower staff” (2002, p. 29). Data can help you see small changes and can make visible changes that might otherwise be overlooked.

7. “Data can prevent one-size-fits-all and quick-fix solutions” (Love, 2002, p. 30). Using data objectively is a difficult challenge. Each person brings past experiences, training, biases, and opinions to the assistive technology consideration and assessment process. Data can provide additional input to inform decision making. Teams are encouraged to explore other options, rather than simply apply what they have used in the past, particularly when the quick-fix solution doesn’t have the desired result.

8. “Data can give schools the ability to respond to accountability questions” (Love, 2002, p. 30). The No Child Left Behind legislation has called schools to accountability. As the National Governors Association points out, this call to accountability is not new, but the focus on student achievement, rather than on school inputs and processes, is new,
“Policymakers are turning to performance-based accountability measures for districts, schools, educators, and students” (National Governors’ Association, n.d.). The data being collected in Ohio focus on student performance and will help to address the accountability and monitoring questions which schools are currently facing.

9. “Data can help build a culture of inquiry and continuous improvement” (Love, 2002, p. 30). The hope is that the Ohio data indeed promotes a culture of inquiry and continuous improvement on a variety of levels. Teams working with individual students are required to collect data to support the request for funding of a device. This data-collection process promotes inquiry as teams ask themselves, “Is this working? How well? What might work better?” In addition to promoting inquiry at the team level, the data may be used by districts to examine their own assistive technology services. The Ohio Department of Education is eager to improve assistive technology service provision to better meet the needs of all students, and the collection of data should promote this progress. Beyond this, the ATOMS Project will probe the data to investigate how the field of assistive technology can better measure the outcomes of assistive technology.

**Lesson Learned**

Implementation of the ATIP has been a learning process. The pace of development of the entire project was rapid. Because the Ohio ATIP was interested in measuring outcomes, they seized the opportunity to team up with the ATOMS Project staff to collaborate on an outcome measurement system. The timelines for notification of funding for both the ATIP and Project ATOMS demanded the rapid development of the outcome measurement component. Had more time been available, it may have been helpful to further pilot the data collection instruments prior to widespread use. Because the project was implemented in four phases, there have been opportunities to improve the process as the project progressed. ATIP and ATOMS are considering further development of the instruments for national dissemination.

One small, but significant lesson learned is the importance of providing applicants with a list from which to select their choices to maintain consistency, and aid in later analysis of the data. For example, when filling in the application, if participants made spelling errors, used inaccurate names for devices, or were inconsistent in their use of terminology (e.g., EC vs. Early Childhood), searching for specific words was difficult and required extra work. Examining each field to determine whether selection from a menu is an option may reduce problems with data summary and analysis.

Because the people who provide the direct training and implementation in the use of assistive technology play a pivotal role in whether or not a positive outcome is achieved, gathering additional information about the key implementers might have been informative. The person completing the application was required to respond to the question “As you initiate this project, what expectations do you have about how assistive technology might help this targeted student?” However, whether there was team consensus regarding this issue was not clear. Additionally, the degree of training in assistive technology that the student's team had received was not readily available. This additional information would be helpful in examining outcomes of the assistive technology.

Applicants were required to identify measurable goals related to the requested technology and to develop a related evaluation plan. The evaluation plan was to include information about the techniques used and the frequency for collecting data to evaluate student progress. This is an area in which teams require ongoing training, and the field may need improved instrumentation.

**Conclusion**

The implementation process created to administer the distribution of $9.3 million dollars of funding for acquisition of assistive technology and measure the outcomes of these efforts has been briefly described. The instruments developed as a part of this process, including the ATIP application, the AT District Profile, and the Student Performance Profile, have made available a wealth of information that will be used for the analysis of the outcomes of assistive technology in the public schools. Implementation of the project required significant vision and energy. In addition, the project would not have been possible without teamwork, including those individuals directing the project and designing the instruments,
those providing support, the teams who completed the application and the profiles, and those who reviewed the applications. The next step in the process involves additional analysis the of the outcome data to address critical questions about the effectiveness of assistive technology in school settings.

References

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