Validation of an Inventory of Best Practices in the Provision of Augmentative and Alternative Communication Services to Students With Severe Disabilities in General Education Classrooms

Stephen N. Calculator
Tibbany Black
University of New Hampshire, Durham

Purpose: To compile and then validate a set of evidence-based best practices related to augmentative and alternative communication (AAC) and its role in fostering the inclusion of students with severe disabilities in general education classrooms and other inclusive settings.

Method: A comprehensive review of the literature pertaining to AAC and inclusive education for students with severe disabilities in inclusive classrooms resulted in an inventory of possible best practices. Reliability testing was conducted to verify levels of evidence assigned to each source and corresponding practice. Practices were reviewed and validated by a panel of 8 experts. Statistical analysis revealed a high level of internal consistency across items composing the inventory.

Results: An inventory of 91 practices, each assigned to 1 of 8 predetermined categories, was uncovered. Themes arising in experts’ comments related to items in the inventory are discussed.

Conclusions: Possible uses of the inventory are discussed along with suggestions for future research.

Key Words: augmentative and alternative communication, inclusion, best practices

Students with severe disabilities and complex communication needs present special challenges to speech-language pathologists (SLPs) and other educators who are attempting to provide them with an appropriate education in the least restrictive environment, which may be a general education classroom. For purposes of this article, the term severe disabilities refers to students with severe to profound intellectual disabilities and associated challenges with adaptive behaviors, including communication. These students typically require relatively high levels of support from family, educators, related service providers, classmates, and others to be effectively included in general education classrooms while also meeting the demands of daily living and enjoying the best possible quality of life (Calculator, 2009).

The ability to benefit optimally from their education is related strongly to students’, classmates’, teachers’ and others’ access to effective and efficient methods of communication (Calculator & Jorgensen, 1994; Downing, 2005; Kent-Walsh & Light, 2003; Soto, Muller, Hunt, & Goetz, 2001). For students with severe disabilities, this often entails the use of various forms of augmentative and alternative communication (AAC).

Best Practices: A Moving Target

Questions and disagreements may arise with respect to characteristics of AAC programs that constitute best practices. The term best practices is used with reservations because what constitutes best practices today may later be refuted and replaced as fields continue to evolve and the knowledge base continues to expand. For purposes of this investigation, it was conjectured that best practices are evidenced by successfully including students in general education classrooms where they participate in the general education curriculum, as well as other settings outside the classroom where functional skills are required for full participation.

The attainment of best practices is conceptualized to be dependent on effective collaboration between SLPs, teachers, administrators, parents, and other stakeholders who share a common vision and overall mission. It becomes highly

Research
important to delineate what that means and what it is we should be striving for in designing AAC and related programs that promote the full inclusion of all students.

The purpose of this investigation was to compile and then validate a set of best practices related to AAC and its role in fostering inclusive education. The American Speech-Language-Hearing Association (ASHA) discussed the principle of inclusive settings with typical peers in reference to interventions involving persons with mental retardation/developmental disabilities (ASHA, 2005a). That document identified strategies found to be effective in classroom settings but did not address the issue of inclusive education in terms of general education classrooms or general education curriculum. It was reasoned that an inventory of best practices related more specifically to inclusive education could contribute to all stages of program implementation and could constitute an important step in the subsequent development of an instrument for assessing the presence of best practices.

Review of Literature

A comprehensive review of the literature was carried out to identify evidence-based practices (EBPs) pertaining to the role of AAC in inclusive education. The literature, and associated practices, fell into eight predetermined categories: promoting inclusive values; collaboration between general and special educators; collaboration between educators and related service providers; family involvement; choosing and planning what to teach (which included the topic of challenging behaviors); scheduling, coordinating, and delivering inclusive services; assessing and reporting student progress; and instructional strategies. This taxonomy was originally devised by Jackson, Rnydak, and Billingsley (2000) to classify useful practices in inclusive education rather than AAC in particular. However, review of the taxonomy suggested surface validity with respect to capturing a diverse representation of AAC practices as well. It appeared plausible to assume it would be unlikely for a student to be educated effectively in an inclusive classroom without effective methods of communication. The following sections summarize literature pertaining to AAC and inclusive education in relation to each of the eight categories.

Promoting Inclusive Values

Investigators have commented on the importance of teaching AAC skills that foster students’ membership in the school community, networking, and friendships (Blackstone & Hunt-Berg, 2003; Calculator, 2009; Doyle, 2004; Light, Parsons, & Drager, 2002). Ability or disability awareness training may be used to enhance teachers’, classmates’, and other’s overall awareness and acceptance of students who use AAC (Jackson et al., 2000; Kennedy & Itkonen, 1994; Kent-Walsh & Light, 2003; Soto et al., 2001). All students, irrespective of the nature and severity of their disability, have the right to be treated respectfully by others (National Joint Committee for the Communication Needs of Persons With Severe Disabilities [NJC], 1992).

For inclusion to be successful, it is usually necessary to have the support of principals and other school administrators. Among other things, these individuals provide general and special educators the time and resources they need to support students using AAC in inclusive classrooms (Jorgensen, McSheehan, Sonnenmeier, & Cicolini, 2002; Kent-Walsh & Light, 2003; Nochajski, 2001; Thousand & Villa, 1992). Administrative support may also be important for educators and other team members to adapt physical environments to foster all students’ participation (Avramdis, Bayliss, & Burden, 2002; Kent-Walsh & Light, 2003).

Administrators may also demonstrate leadership by enabling and encouraging team members to collaborate when planning and evaluating instructional outcomes (Kent-Walsh & Light, 2003) and by affording staff opportunities to engage in shared planning time (Jackson et al., 2000). This may permit them to analyze classrooms and lesson plans to identify modifications that might optimize learning opportunities for all students, including those who rely on AAC (Calculator, 2009; Dover, 2005; Downing, 2002; Kent-Walsh & Light, 2003).

Inclusive values may also be promoted when schools have a universal mission statement governing the education of all students rather than unwittingly pitting general and special educators against one another (Ainscow, Booth, & Dyson, 2004; Avramdis et al., 2002; Carrington & Robinson, 2004; Kane, Head, & Cogan, 2004; Vlachou, 2004). The mission statement and corresponding policies and practices may convey an expectation that all students are assigned to chronologically age-appropriate classrooms with typical peers (Cushing, Clark, Carter, & Kennedy, 2005; Horn, Lieber, Shouming, Sandall, & Schwartz, 2000; Wehmeyer, Lance, & Bashinski, 2002). The goal is to ensure students are participating in all classroom activities and accessing the general education curriculum at a level that is appropriate for their individual needs (Jorgensen et al., 2002; Kent-Walsh & Light, 2003; Wren & Parkhouse, 1998).

Educators have been encouraged to maintain the highest of expectations for all students (Downing, 2005). If they err, it is generally assumed preferable to set expectations that may be later proven to be too high than to aim low and underestimate students’ capabilities. This principle has been termed the least dangerous assumption (Donnellan, 1984; Sonnenmeier, McSheehan, & Jorgensen, 2005). Finally, inclusive values are reflected in family-centered practices that are sensitive to different families’ cultural values and beliefs (ASHA, 2002, 2005b, 2005c; Cress, 2004; Downing, 2005; Giangreco, Cloninger, & Iverson, 1998).

Collaboration Between General and Special Educators

Calculator and Jorgensen (1994) discussed the importance of educators understanding why a particular student is in their general education classroom and how the student is expected to benefit from instruction in that setting. Meeting individualized and developmentally appropriate needs in general education classrooms requires time to be set aside on a regular basis for collaboration between general and special educators (Dover, 2005; Hunt-Berg, 2005; Jorgensen, McSheehan, & Sonnenmeier, 2006; Wolfe & Hall, 2003). Time is needed to identify classroom and
curriculum modifications that will foster students’ full and active participation in the general education curriculum (Armstrong, Armstrong, Lynch, & Severin, 2005; Calculator, 1999, 2000; Kent-Walsh & Light, 2003) while also addressing individualized education program (IEP) goals (Beukelman & Mirenda, 2005b; Calculator, 2009; Cushing et al., 2005; Downing, 2005; Sonnenmeier et al., 2005).

**Collaboration Between Educators and Related Service Providers**

Although the responsibility for implementing an AAC program is shared by many, its coordination often resides primarily with the SLP (ASHA, 2004; Calculator, 2009). This necessitates an array of knowledge and skills that enable SLPs to (a) assess needs and abilities of students using AAC, as well as their communication partners, in a variety of settings; (b) evaluate outcomes of AAC; (c) advocate for EBPs designed to increase students’ levels of participation and quality of life; (d) provide training to teachers and other team members; and (e) locate funding sources (ASHA, 2002).

SLPs are encouraged to operate in consultative and collaborative models of service delivery (Ainscow et al., 2004; ASHA, 2005b; Avramidis et al., 2002; Calculator, 2009; Jackson et al., 2000; Sonnenmeier et al., 2005; Soto et al., 2001; Swengel & Marquette, 1997) and to “provide services that are family-centered, culturally appropriate, comprehensive, compassionate and produce meaningful life outcomes” (ASHA, 2005b, p. 6). Consultations should include discussions regarding opportunities for teachers to incorporate AAC into the general curriculum (Downing, 2002; Rainforth, York, & McDonald, 1992; Robinson & Sadao, 2005). They may also involve SLPs sharing strategies teachers can use to address specific communication objectives in their classrooms (Calculator, 2000; Kent-Walsh & Light, 2003; Soto et al., 2001).

**Family Involvement**

Effective AAC programs acknowledge the importance of family involvement in all aspects of decision making (Jackson et al., 2000; Robinson & Sadao, 2005), including discussions about how AAC skills targeted at school may be generalized to daily activities at home, when appropriate (ASHA, 2004; Calculator, 1988; Cress, 2004). This may include providing direct coaching to parents and siblings. Families should have ample opportunities to provide input regarding what they perceive to be their children’s greatest communication needs and their own highest priorities (ASHA, 2005b, 2005c; Cress, 2004; Downing, 2005; Giangreco et al., 1998). Similarly, parents’ voices should be heard when selecting AAC methods, goals, and objectives that are sensitive to family values and beliefs (ASHA, 2002; 2005b, 2005c).

**Choosing and Planning What to Teach**

Whenever possible, we are encouraged to rely on procedures that are evidence-based and thus empirically and/or socially validated (Schlosser & Raghavendra, 2004). Decisions about what AAC skills to teach should be team decisions, rather than residing with any one member (Knowlton, 1998). These decisions should also consider students’ wishes and priorities. Students may signal their priorities overtly and/or covertly (Cress, 2004; Cushing et al., 2005; Downing, 2005; Horn et al., 2000; Wehmeyer et al., 2002).

The AAC program should target content students find motivating and reinforcing, increasing their attentiveness, interest, and likelihood of success. Some important factors may include response effort, rate of reinforcement, and quality of reinforcement (Calculator, 1999; Johnston, Reichle, & Evans, 2004). Students may also prefer acquiring skills that foster their assuming increasing self-determination or responsibility for the choices and decisions that affect them directly or indirectly (Calculator, 2009; Jorgensen et al., 2006; Palmer, Wehmeyer, Gipson, & Agran, 2004; Wehmeyer, Lattin, Lapp-Rincker, & Agran, 2003).

When students are unable to influence others’ actions because they lack conventional means of doing so, they may channel their frustration into challenging, or problematic, behaviors. Johnston et al. (2004) noted that when individuals have multiple ways of conveying the same communicative function, they will typically elect to use the method they find to be most efficient. Investigators have recommended building on conventional and easily understood behaviors that individuals are already using to communicate while replacing problem behaviors with preferable alternatives. Alternative behaviors are designed to net the same desired outcomes, functional equivalents, as the behaviors we are trying to replace (ASHA, 2004, 2005b, 2005c; Bopp, Brown, & Mirenda, 2004; Mirenda, 1997, 2003).

It is thus important to understand the purposes, or functions, of students’ behaviors when they respond as well as when they spontaneously initiate communication. Investigators recommend teaching students to use their AAC systems to express a full range of communicative functions (Cress & Marvin, 2003; Downing, 2005; Glennen & Calculator, 1985; Jorgensen et al., 2002). Students who are able to use a symbol to label may be unable to use that same symbol for a different function, such as requesting an object from their communication partner (Cress & Marvin, 2003; Glennen & Calculator, 1985).

In many cases, students’ priorities may revolve around AAC skills that they have multiple opportunities and reasons to use functionally throughout the day, including those fostering successful engagement in the general education curriculum and classroom (ASHA, 2004; Calculator, 1999, 2009; Cushing et al., 2005; Jackson et al., 2000; NJC, 1992; Sonnenmeier et al., 2005; Von Tetzchner, Merete, Sjothun, & Grindheim, 2005). The criterion of ultimate functioning (Brown, Nietupski, & Hamre-Nietupski, 1976; Calculator, 2009) may be a useful construct in helping us decide whether to teach a particular skill on the basis of its functional value. Skills taught are ones that will need to be carried out by others if the student fails to acquire these skills him- or herself. For example, a child who is unable to make choices will rely on others to do so. It thus constitutes a functional skill.

Functional skills include those that students will find to be useful now as well as in the future (Beukelman & Mirenda, 2005e). Some instruction may target skills we can expect students to acquire in a reasonable amount of time, suggesting ease of acquisition (Calculator, 1999; Johnston et al.,
2004). We might also emphasize skills that will contribute to students growing up to be productive and contributing members of society (Dover, 2005; Downing, 2002). Many of these skills can be found in the general education classroom and the corresponding curriculum.

Functional skills may also have bearing on students’ memberships and friendships in and out of school (Blackstone & Hunt-Berg, 2003; Calculator, 2009). We previously discussed the importance of AAC in fostering friendships and other relationships. As pointed out by Light et al. (2002), “There’s more to life than cookies” (p. 187).

To build social networks, students need to acquire methods of communication that are effective with persons familiar with them and their methods of communication as well as those unfamiliar with both (Calculator, 2002; Johnston et al., 2004). We may thus be drawn to readily understood methods of communication.

AAC systems are selected largely on the basis of a process of matching students’ skills, abilities, and needs to characteristics of different AAC systems, referred to as feature matching or predictive assessment (Beukelman & Mirenda, 2005a; Calculator, 2000; Cress, 2004; Glenn, 1997). Rather than identifying a single aided or unaided method of communication, we are encouraged to explore multiple methods of communication with our students (ASHA, 2004; Calculator, 1999).

Scheduling, Coordinating, and Delivering Inclusive Services

Investigators have highlighted the importance of administrators, teachers, parents, and others all buying into collaborative and consultative models of service delivery (Calculator, 2009; Downing, 2005; Swengel & Marquette, 1997). SLPs and other related service providers can provide valuable input to special education and general education teachers about ways of modifying the curriculum to support the inclusion of all students (Calculator, 2009; Rainforth et al., 1992; Robinson & Sadoa, 2005). This may often include teaching classmates and other peers how to use the AAC system when interacting with a student, including how to respond to students’ communicative attempts (Light, Drager, & Nemser, 2004; NJC, 1992; Sonnenmeier et al., 2005; Von Tetzchner et al., 2005). Investigators have tied children’s intentional uses of communication to others’ responsiveness to their communicative attempts (Yoder & Warren, 1998).

The instructional process may include teaching others to implement communication programs traditionally associated with SLPs. This permits AAC interventions to be carried out by the persons naturally expected to be interacting with the student in any particular situation. Jorgensen (1992) emphasized the importance of relying on natural and least intrusive supports whenever possible.

Inclusive and integrated AAC services are typically provided in the general education classroom and other natural settings (Calculator, 2009). Numerous investigators have emphasized the need to integrate communication objectives into the general education curriculum rather than working on communication skills in isolation (Calculator, 2002, 2009; Cushing et al., 2005; Downing, 2005; Downing & Eichinger, 2003; Giangreco et al., 1998; Jorgensen et al., 2002). Guess and Helmstetter (1986) introduced the notion of skill clusters, pointing out that any given activity may require a combination of different skill sets, one of which might involve communication.

As discussed earlier, integrated models of service delivery require collaboration. IEPs and other planning tools should specify the role of the AAC system in facilitating students’ access to the general education curriculum (Calculator, 2009; Cushing et al., 2005). If they are to participate actively and meaningfully in the curriculum, students need AAC systems that are consistently accessible in all settings (Calculator, 2009; Downing, 2005; Meyer & Eichinger, 1994; Nietupski, Schultz, & Ockwood, 1981; Sonnenmeier et al., 2005). AAC systems must not only be accessible but also operational at all times. Local supports are necessary to ensure devices are in good working order. This can be facilitated by students and others having access to persons who are proficient using the AAC system (Von Tetzchner et al., 2005).

Such individuals are also in a position to model effective uses of AAC for the student and others (Goossens’ Crain, & Elder, 1992; Light, 1997; Von Tetzchner et al., 2005).

Assessing and Reporting Student Progress

Particularly in this era of accountability, it is advisable to assess AAC progress in relation to students’ mastery of specific objectives designated in the general education curriculum as well as students’ IEPs (Downing, 2005). Jackson et al. (2000) found that experts in the area of severe disabilities stressed the importance of performance-based, authentic, in-context assessments. This represented a shift from norm-referenced comparisons with quantitative and qualitative measures of personal progress. In addition, respondents cited the need to ensure that targeted outcomes are viewed as important by significant others (i.e., social validation).

Generalizing this information to AAC, and conjecturing about possible implications, we might wish to identify AAC outcomes that relate to changes in quality of life as perceived by students, peers, their families, and other important people in their lives. This may include evidence that improved communication skills are enabling students to forge new friendships and acquaintances. It may also correspond to enhanced skills meeting communication demands of daily living (ASHA, 2004) and greater self-determination. Importance might also be placed on evidence that students and others are satisfied with AAC outcomes. These may include data supporting students’ ongoing acceptance rather than rejection and abandonment of their AAC systems (Johnston et al., 2004). It is recommended that data collection occur regularly and systematically, preferably in natural settings that offer students multiple opportunities and reasons to use their AAC systems (ASHA, 2005c; Calculator, 2009; Calculator & Jorgensen, 1994; Cushing et al., 2005; Downing & Eichinger, 2003; Jorgensen et al., 2002).

Students’ communication needs and abilities change over time, as do the corresponding communication demands and opportunities they experience. It is thus important to monitor and reassess students’ uses of their AAC systems longitudinally. Equally important are ongoing assessments of teachers’,
paraprofessionals’, classmates’ and others’ interactions with the child, with as well as without the AAC system (Calculator & Dollaghan, 1982).

**Instructional Strategies**

Previously noted themes of collaboration and integrated models of service delivery are certainly integral concepts here as well. The idea is to embed AAC in naturally occurring activities that necessitate its use (Calculator, 2009; Downing, 2005; Horn et al., 2000; Jackson et al., 2000; Sonnenmeier et al., 2005). When AAC instruction does not occur in natural settings, there should be systematic efforts to foster students’ generalizing corresponding skills outside these instructional contexts (NJIC, 1992).

Instruction should target students’ as well as their communication partners’ uses of AAC (Johnston et al., 2004). The latter include methods of initiating and responding to students’ communicative attempts (Calculator, 2009; Downing, 2005; Iacono, 2003; Light et al., 2004; Yoder & Warren, 1998). Sonnenmeier et al. (2005) reported that teachers may need to be taught to use AAC systems functionally with their students.

As discussed earlier, best practices encourage the use of natural and least intrusive supports. Students with disabilities are expected to solicit assistance from the same persons a student without disabilities would seek out in a similar situation. In many cases this might be a classmate rather than a paraprofessional (Jorgensen et al., 2002).

Students may be more successful communicating with others when they have access to multiple methods of communication, including vocalizations and speech (Calculator, 1988; Kent-Walsh & Light, 2003), and are able to shift from one method to another depending on the circumstances (Calculator & Dollaghan, 1982). Students also benefit when they are taught to use a single symbol or sequence of symbols for a variety of purposes (Glennen & Calculator, 1985).

AAC systems should be introduced as soon as a student is determined to be already, or at risk of being, unable to use speech as a primary method of communication. Still, efforts to teach effective uses of AAC should not imply abandonment of speech and other forms of oral communication, all of which may be incorporated in the overall communication system (Blischak, Lombardino, & Dyson, 2003; Cress & Marvin, 2003).

We previously discussed the importance of teaching skills that students may continue to find useful in adulthood. These include earlier covered themes, such as social closeness (Blackstone & Hunt-Berg, 2003; Light et al., 2002) and participation. Students’ skills will change over time, as will communication demands. It is thus important that AAC systems consider students’ present levels of communication while promoting more sophisticated systems associated with more robust communication (Calculator, 2007).

In some situations, students may have access to their AAC systems but lack opportunities and reasons to use them. In these circumstances, we may need to encourage teachers and others to engineer or to modify classrooms and other environments to foster students’ uses of AAC, thus increasing their levels of participation (Avramdis et al., 2002; Calculator, 1999, 2002, 2009; Downing & Eichinger, 2003; Kent-Walsh & Light, 2003). This may be facilitated by providing students, classmates, and others with opportunities to see more experienced communicators modeling effective uses of students’ systems or similar devices (Carter & Maxwell, 1998; Goosens et al., 1992; Light, 1997; Von Tetzchner et al., 2005).

Environmental modifications such as these should promote students assuming increasing responsibility for events affecting them directly and personally. We discussed this principle earlier in relation to self-determination. AAC programs should be modified before students display evidence that they devalue these efforts and are thus prone to rejecting or abandoning different AAC systems (Johnson, Inglebret, Jones, & Ray, 2006).

**Method/Results**

The preceding review was conducted in conjunction with a search of the literature that spanned several databases, including EBSCOhost, Academic Search Premier, Cochrane Database of Systematic Reviews, ERIC, MEDLINE, PsycARTICLES, and PsycINFO. Key words used for the searches included “augmentative and alternative communication,” “inclusive education,” and “students with severe disabilities.”

Both investigators reviewed all materials resulting from the search, looking for direct or indirect evidence supporting possible best practices related to AAC. Additional sources were identified by following up on references cited in these initial publications.

Of the 158 references examined, there were 102 journal articles, 43 books and book chapters, 7 unpublished manuscripts and papers, and 6 other sources. To be considered for the best practices inventory, each practice had to be (a) discussed implicitly or explicitly as a best practice, with clear implications for AAC; (b) measurable quantitatively and/or qualitatively; and (c) supported at a level of evidence of five or higher on Schlosser and Raghavendra’s (2004) hierarchy of EBPs. This taxonomy is unique in that it was designed with AAC in mind. Schlosser and Raghavendra defined EBPs as the “integration of best and current research evidence with clinical/educational expertise and relevant stakeholder perspectives in order to facilitate decisions about assessment and intervention that are deemed effective and efficient for a given direct stakeholder” (p. 3).

The two investigators jointly extracted 107 possible best practices from the literature. They then assigned corresponding levels of supporting evidence on the basis of the previous taxonomy, which specifies five levels of evidence on the basis of corresponding threats to internal validity.

Schlosser and Raghavendra (2004) pointed out that the gold standard of EBP—randomized controlled trials—may be inappropriate for AAC research involving individuals with disabilities. Similarly, group designs are often not an option because of the low incidence and heterogeneity of the population of individuals who use AAC. This helps explain why AAC research rarely occurs at these levels of EBP. It may also come as no surprise that their highest ranking level involves meta-analyses of single subject experimental and quasi-experimental designs. Levels 2 and 3 involve a variety
of single subject and group designs. At Level 4, we see pre-
experimental group designs and case studies; finally, Level 5
includes nonexperimental designs, respected opinions, text-
book authors, expert presenters, and scholarly newsletters.
It is important to point out that assignment of a study to a
higher level in the hierarchy does not necessarily ensure greater
certainty of validity. Research assigned a lower level of EBP
may in fact have greater treatment integrity than that conducted
higher in the hierarchy.

Schlosser and Raghavendra (2004) indicated that EBP in
AAC is in its infancy. It is thus perhaps understandable that
much of the current literature falls at Levels 4 and 5. Group
designs are particularly scarce, reflecting the challenge of find-
ing homogeneous samples within the highly heterogeneous
and scarce population of individuals who use AAC. Items
included in the best practices inventory were supported by re-
search at a level of five or higher on Schlosser and Raghavendra’s
hierarchy. This criterion resembled that used in a previous
investigation examining roles and responsibilities of SLPs
serving persons with mental retardation/developmental
disabilities (ASHA, 2005b) that, in light of a lack of empirical
evidence, drew many of its recommended practices from
applications of theoretical models, societal norms, and gov-
ernment mandates and regulations.

Reliability Study for Levels of Evidence

An external rater who was unfamiliar with the specific
purposes of the investigation was asked to review and to
assign levels of evidence to 39 (approximately 25%) refer-
cences that supported practices included in the inventory.
Instances in which the external rater assigned ratings at or
above Level 5 constituted agreements with the investigators
because this was the cutoff for inclusion of practices in the
inventory. A 100% level of agreement was obtained.

Best Practice Categories

The principal investigator assigned each practice to one of
the eight previously discussed categories from Jackson et al.’s
(2000) taxonomy. The second author then reviewed the pri-
mary author’s assignments of practices to categories and
indicated whether she agreed. Discrepancies were resolved
through a process of consensus, and final assignments of
practices to categories were made.

Next, an external rater unfamiliar with the purposes of this
study examined each cluster of practices, as opposed to in-
dividual items, and assigned the cluster to one of the cate-
gories. There was 100% agreement between the investigators
and the external rater.

Two additional external raters were then asked to assign
each individual practice, presented in random order, to a cat-
egory. Assignments by each rater were compared with those
of the investigators. As expected, levels of agreement—
measured by the percentage of practices assigned to the same
categories by the investigators and each external rater—were
low: 46% and 55% for Raters 1 and 2, respectively. It was
clear that the categories were not mutually exclusive. For
example, a practice such as “my child is accepted and treated
respectfully by other students” corresponded to the promoting
inclusive values category. However, another practice, “the
SLP collaborates with classroom teachers and paraprofes-
sionals frequently enough to ensure communication goals are
fully integrated within the special education and/or general
education curriculum,” could conceivably fall into the fol-
lowing categories: collaboration between educators and re-
lated service providers; choosing and planning what to teach;
and scheduling, coordinating, and delivering inclusive ser-
vices. These findings indicate that although individual prac-
tices may be compared and contrasted, the categories to
which they are assigned cannot.

The second author met with the two external raters indi-
vidually and reviewed with them the investigators’ assign-
ments of practices to the various categories in relation to their
assignments. Both raters agreed with all of the investigators’
assignments, even when different than their assignments.
Thus, original assignments of practices to categories were
retained.

Validation of the Best Practices Inventory

Expert panel. An initial call for experts in AAC and in-
clusive education was issued via the Web forum of ASHA’s
Special Interest Division 12, Augmentative and Alternative
Communication. Four panelists were selected from the nine
who responded. Four additional experts were solicited directly
by the principal investigator, who was familiar with their ac-
ademic, clinical, and research credentials.

Experts were identified primarily on the basis of their ex-
pertise in the areas of AAC and inclusive education. In addi-
tion, all held doctoral degrees in speech-language pathology
or related fields and had published and/or presented their work
in refereed journals and other widely disseminated venues.
All of the experts had extensive practical experience in the
fields of AAC and inclusive education. The goal was to arrive
at a panel that was representative of the diverse AAC com-

A summary of panelists’ qualifications can be found in
Table 1. Their experience in the field of AAC ranged from 15
to 31 years, and all had 10 or more years of experience with
inclusive education. The number of individuals with whom
they provided AAC services directly and/or indirectly
ranged from approximately 20 to “in the hundreds.” Cons-
istent with the goal of obtaining a representative sample,
exterts had provided AAC services in a variety of capacities,
most commonly in the roles of AAC specialist (n = 5), con-
sultant (n = 6), university professor (n = 8), and SLP (n = 6).
Two panelists offered a family member/caregiver perspective.

Continuing with the data in Table 1, the experts had con-
ducted AAC activities in a range of settings, most of them
in multiple settings, and all of them in schools. Percentages
of time spent in various settings (e.g., early intervention,
hospitals, AAC centers, university, rehabilitation, and other
medical settings) varied, but between the eight panelists all
settings were represented to some extent. All of the panelists
engaged in university teaching and educational and/or clinical
practice. Scholarly production varied with respect to the num-
ber of articles they had published in peer-reviewed journals
(1–27), books/book chapters (0–10), and elsewhere. All eight
experts had experience providing AAC services to school-age
<table>
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<th>E1</th>
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<th>E3</th>
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<th>E6</th>
<th>E7</th>
<th>E8</th>
</tr>
</thead>
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<td>Years of experience in the field of augmentative and alternative communication (AAC)</td>
<td>20</td>
<td>24</td>
<td>31</td>
<td>30</td>
<td>22</td>
<td>22</td>
<td>15</td>
<td>18</td>
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<tr>
<td>Years of experience with inclusive education</td>
<td>24</td>
<td>10</td>
<td>23</td>
<td>32</td>
<td>15</td>
<td>18</td>
<td>23</td>
<td>12</td>
</tr>
<tr>
<td>Approximate total number of AAC clients with whom you have worked, either directly or indirectly</td>
<td>50</td>
<td>Hundreds</td>
<td>&gt;150</td>
<td>3</td>
<td>&gt;100</td>
<td>55</td>
<td>20</td>
<td>&gt;50</td>
</tr>
<tr>
<td>Occupations or roles in the area of AAC in which you have engaged (check all that apply)</td>
<td>X</td>
<td>X</td>
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<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Settings in which you have conducted AAC activities</td>
<td>30</td>
<td>0</td>
<td>10</td>
<td>30</td>
<td>30</td>
<td>10</td>
<td>15</td>
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</tr>
<tr>
<td>Aspects of AAC in which you have been engaged (check all that apply)</td>
<td>X</td>
<td>X</td>
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<td>X</td>
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<tr>
<td>Aspects of inclusive education in which you have been engaged (check all that apply)</td>
<td>X</td>
<td>X</td>
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<td>X</td>
<td>X</td>
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<td>If you have engaged in research in AAC and/or inclusive education, please note your total number of publications in the following sources</td>
<td>1</td>
<td>7</td>
<td>27</td>
<td>5</td>
<td>4</td>
<td>21</td>
<td>4</td>
<td>6</td>
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<tr>
<td>Estimated number of presentations on AAC inclusive education</td>
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<td>20</td>
<td>18</td>
<td>&gt;30</td>
<td>?</td>
<td>25</td>
<td>10</td>
<td>11</td>
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<tr>
<td>Ages of individuals for whom you have provided AAC services either directly or indirectly</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Ages of individuals with whom you have provided inclusive education services, either directly or indirectly</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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</tr>
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</table>

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children, and most provided AAC services across the lifespan. Similarly, all eight experts had provided inclusive educational services.

**Validation procedure.** Experts used a 7-point Likert scale that ranged from 1 (strongly disagree) to 7 (strongly agree) to rate each of the 107 proposed best practices. Space was also available for the experts to comment on each item if they chose to do so. Of the original 107 items, 99 were retained, each having received a mean rating of ≥6.0 across experts, with no fewer than six of the eight raters assigning a value of six or greater. A Cronbach’s alpha was computed to determine the internal consistency of the 99 items, resulting in a level of .970. This suggests a strong correlation between items reviewed by the expert panel.

Additional practices were included in the inventory if cited by no fewer than two experts. In addition, the practices had to be substantiated by literature that corresponded to a level of evidence of five or higher. This resulted in four additional practices, each of which was assigned to a category by the two investigators.

Experts commented in response to items they judged to be unclear. Three practices were reworded for enhanced clarity. Twelve items were deemed by the experts and/or one or both investigators as important, achieving average scores ≥6.0, but redundant. These items were deleted or combined with remaining items. Consensus was reached between the investigators that the revised items retained the meaning conveyed in the original items. The final inventory consisted of 91 items (see the Appendix).

**Analysis of Experts’ Comments**

A follow-up qualitative analysis was conducted to discern any themes that might have emerged in experts’ comments in reaction to each item. A theme was identified by the principal investigator when mentioned by no fewer than two experts. The most common themes are discussed briefly below in connection with the eight categories.

**Promoting inclusive values.** Several experts cited the importance of teaching AAC skills that foster membership in the school community, including the development of friendships with typical peers. One noted, “this may be the most important contribution AAC makes to their [students’] lives.” Another commented, “Has a student really gained anything substantive if they are no more connected with others at the conclusion of a program than at the onset?” Experts reported experiences of AAC programs targeting social interactions and yet failing to promote friendships.

**Collaboration between general and special educators.** Here, the most frequently cited theme related to the importance of general educators understanding their roles in all students’ education. As one expert phrased it, “some regular educators think it is an inconvenience to have children with special needs in their classrooms and for them to spend time to make accommodations for them.” Two experts cited time to collaborate as a key element.

**Choosing and planning what to teach.** Most comments related once again to the idea of shared responsibility in the design and implementation of AAC programs and to the need to tie these programs to both the general education curriculum and functional life skills or what one expert referred to as “life-goals.” Experts noted “no one system works all the time in all places,” calling for the need to teach students multiple methods of communication. They felt AAC methods selected need to consider children’s priorities (e.g., “all individuals should be involved in determining their future”) as well as the needs of communication partners.

**Scheduling, coordinating, and delivering inclusive services.** Experts cited the need for AAC to be pervasive throughout the curriculum. One expert advised against including specific AAC goals in the IEP, instead encouraging teams to combine AAC objectives with broader curricular goals in and out of the classroom.

**Assessing and reporting student progress.** Several experts noted that evaluations conducted in natural settings are far more useful than those occurring in isolated settings. One commented, “it is unclear to me why evaluations in ‘structured’ settings would provide useful information on the extent to which students are able to effectively communicate in their everyday lives.” At the same time, the need for naturalistic assessments was implicated as a primary reason why AAC assessments were often “not cost effective.”

**Instructional strategies.** Several experts rejected pull-out services, instead advocating for more integrated practices. Another theme related to self-determination (e.g., “when students have tangible and frequent evidence of the value of AAC in enhancing the quality of their lives, we can expect them to place greater value upon these systems and use them without external prodding”).

**Discussion**

The purpose of this investigation was to compile and then validate a set of best practices related to AAC and its role in fostering inclusion. It is important to note that all practices included in the inventory had attained a level of evidence of five (the lowest level of support) or higher on Schlosser and Raghavendra’s (2004) hierarchy. This rather liberal criterion...
was necessary because of the relative paucity of more rigorous and methodologically sound AAC research. Certainly, this is changing as empirical research in this area gains momentum; however, the need for carefully controlled investigations persists.

As indicated in the introduction to this article, the term best practices may be misleading in that it suggests the apex of a continuum of alternatives. That spot typically changes as fields evolve, the knowledge base expands, and new evidence emerges to suggest different practices may hold greater promise. Although the current inventory was conceptualized and implemented with students with severe disabilities in mind, future research may suggest these practices are applicable with the general population of students who use AAC.

This inventory could prove to be beneficial for SLPs, teachers, parents, administrators, and others in at least five ways: (a) eliciting parents’ priorities regarding what they would like to see in their children’s AAC programs, fostering common ground between educators and parents; (b) examining the quality of students’ current AAC programs in relation to best practices; (c) providing ideas for the content and delivery of AAC services within the general education classroom; (d) measuring changes in AAC programs over time; and (e) tracking the impact of broader systems change efforts in schools, school districts, and beyond. Items appearing in the inventory of best practices are purposely worded from the family perspective (e.g., “my child,” “our child,” “our family”). The intention was to foster practices that were child- and family-centered irrespective of the particular team member or other party. As such, they serve as benchmarks that can be shared with all persons involved in students’ AAC programs.

There is currently a strong push to avail all students with access to the general education curriculum and to hold professionals accountable for demonstrating students’ attainment of general education goals and objectives (No Child Left Behind Act, 2002). The proposed inventory of best practices may contribute to SLPs’, teachers’, administrators’, and parents’ efforts to align special education and general education curricula and move toward a model of full inclusion that values all students’ abilities.

Acknowledgments

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Contact author: Stephen N. Calculator, University of New Hampshire, Department of Communication Sciences and Disorders, Hewitt Hall, 4 Library Way, Durham, NH 03824-3563. E-mail: stephen.calculator@unh.edu.
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Inventory of Best Practices in the Provision of AAC Services to Students With Severe Disabilities in Inclusive Education

Promoting Positive Values

1. AAC skills taught foster my child’s membership in the school community.
2. The AAC program fosters my child’s development of friendships and other acquaintances, especially with typical peers.
3. AAC use enhances classmates’ overall awareness and acceptance of my child’s abilities.
4. The school conducts ability/disability awareness activities to foster other students’ and instructors’ understanding and appreciation of my child and how he/she communicates.
5. My child is accepted and treated respectfully by teachers and other staff.
6. My child is accepted and treated respectfully by other students.
7. Our principal and other key administrators provide visible support for inclusive education.
8. The principal provides teachers with the time and resources they need to acquire skills necessary for effectively including my child in their classroom.
9. The school principal gives teachers and related service providers, such as speech-language pathologists, occupational therapists, and physical therapists, sufficient time for team planning so they can discuss curriculum modifications, objectives, and outcomes of instruction.
10. There is a broadly recognized school mission that guides all students’ education. The mission statement is supported by both general education and special education staff.
11. My child is included in age-appropriate general education classes no less than 80% of the day.
12. The AAC program and communication instruction in general is sensitive to and reflective of our family’s cultural values and beliefs.

Collaboration Between General and Special Educators

13. General educators understand their role in including my child in their classroom, including what it is we are expecting our child to learn in general education classrooms and other settings.
14. Special educators understand their role in including my child in the general education classroom, including what it is we are expecting our child to learn in general education classrooms and other settings.
15. General and special educators meet routinely and sufficiently to discuss curriculum supports and accommodations needed to foster my child’s active participation in the general education curriculum.
16. General and special educators meet routinely and sufficiently to discuss my child’s individualized education program (IEP) objectives, including those related to the use of AAC, and how communication and other objectives can be incorporated in instruction in the general education classroom and elsewhere.

Collaboration Between Educators and Related Service Providers

17. Although the speech-language pathologist has primary responsibility for the AAC program, the actual implementation is shared by many, including teachers, paraprofessionals, and peers.
18. The speech-language pathologist has the knowledge and skills necessary to foster effective implementation of AAC in the classroom and other meaningful environments at school.
19. The speech-language pathologist consults with teachers and paraprofessionals to plan how instructional and related communication objectives can be addressed in different environments.
20. Administrators, teachers, parents, and others recognize and support effective uses of a consultative model in which AAC services are implemented by persons in addition to or in place of the speech-language pathologist.
21. Teachers support our child’s access to and effective use of AAC, recognizing the connection to classroom success.

Family Involvement

22. The speech-language pathologist and other team members incorporate the family’s ideas, concerns, and priorities for their child when designing and implementing AAC programs at school.
23. The family receives the supports they need from the school to have an opportunity to play a clear and significant role in helping their child generalize the use of AAC from school to home.
24. Direct coaching from the speech-language pathologist and/or other knowledgeable persons is available to family members if they wish to learn how to incorporate AAC use more effectively and practically at home.
25. There are procedures in place to coordinate AAC instruction between home and school.
26. The family plays an important and active role in the AAC assessment process, including the identification and prioritizing of communication needs at home.
27. The team seeks out and values family input regarding AAC and other goals for their child, including the selection of methods of communication at school and at home.

Choosing and Planning What to Teach

28. The content and delivery of AAC programs draw upon practices found to be effective in the scientific literature (i.e., they are evidence-based).
29. Selection of the AAC system and ideas about its implementation involve a team decision.
30. Communication skills are selected in part based on their importance to our child.
31. The content of the AAC program is selected and implemented in ways that are motivating and reinforcing for my child, increasing his/her attentiveness, interest, and likelihood of success.
32. AAC systems are selected and implemented with considerations of our child’s preferences, whether or not these are signaled overtly.
33. Our child’s AAC system will better enable him/her to have a greater degree of control over decisions affecting him/her, now and in the future. This may take forms such as making choices and regulating the actions of others. This will be sensitive to family and cultural values related to independence, interdependence, and autonomy.
34. Teachers, classmates, and others understand the relationship between communication and challenging, or problematic, behavior (e.g., these behaviors are more likely to occur when children lack other more desirable means of expressing themselves).
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Inventory of Best Practices in the Provision of AAC Services to Students With Severe Disabilities in Inclusive Education

35. If our child exhibits challenging, or problematic, behaviors, the AAC program includes attempts to replace these behaviors with other socially appropriate and conventional methods of communication.
36. AAC goals consider my child’s opportunities and reasons to communicate in different environments and situations.
37. The AAC program targets skills our child is likely to have multiple opportunities to use functionally throughout the day.
38. AAC goals include those designed to address our child’s functional needs in different environments (e.g., classroom, music, art, physical education, cafeteria, and playground) and situations.
39. The communication skills our child is learning are intended to help him/her meet present communication needs and demands more so than those anticipated far off in the future.
40. The communication skills our child is learning for short-term communication needs are ones he/she can be expected to acquire in a reasonable amount of time.
41. AAC goals and objectives are based partially on communication demands of the general education curriculum.
42. There are objectives in place that are designed specifically to foster our child’s membership and active participation in different environments at school.
43. AAC goals selected are ones that may reasonably be expected to foster our child’s becoming a fully participating member of the community, consistent with family and cultural values.
44. Our child’s goals include using the AAC system to initiate and maintain friendships and other relationships with peers and others.
45. The AAC program directly addresses social closeness and includes efforts to promote my students’ development of acquaintances as well as friendships, particularly with typical peers.
46. Our child is learning to interact with a broad range of communication partners, including those who are not familiar with him/her and his/her methods of communication.
47. Our child’s AAC system is one we can expect to be understandable even to those unfamiliar with our child and his/her method of communication.
48. Our child’s AAC system was selected, in part, through a process of matching our child’s various skills and abilities, such as speech, language, motor cognition, vision, and behavior, to features of different AAC systems, such as types of symbols and ways of accessing them, types of output, and so forth.
49. The AAC program builds upon positive communicative behaviors our child was already demonstrating.
50. The AAC program targets not only expressive skills but also receptive skills such as the comprehension of language and ability to respond to others.
51. Our child is being taught to initiate communication exchanges with others.
52. Our child is learning how to use the AAC system for spontaneous communication, rather than solely in response to others’ prompting and cues.
53. If successful, our child’s AAC program will enable him/her to more effectively meet communication demands that arise in different situations.

Scheduling, Coordinating, and Delivering Inclusive Services

54. Classmates and other peers are being taught how to communicate effectively with our child.
55. Paraprofessionals and other staff receive sufficient consultation from speech-language pathologists and others to be able to integrate AAC instruction in relevant activities throughout the day.
56. Communication interventions are rarely carried out in a therapy room but instead occur in classrooms and other natural settings.
57. Communication objectives are integrated into the general education curriculum. Rather than working on communication in isolation, our child is learning communication skills that enable him/her to access and participate more effectively in activities taking place in the classroom, playground, cafeteria, and other environments.
58. The IEP or individualized family service plan specifies how our child will use the AAC system to access the general education curriculum.
59. Our child usually has access to the AAC system when he/she needs it.
60. The AAC system is usually operational and in good working order.
61. Our child has access to persons who use a system the same or similar to our child’s proficiently, thus providing effective models of AAC use.

Assessing and Reporting Student Progress

62. AAC outcomes are examined in relation to my child’s achievement of IEP goals and objectives.
63. Progress is evaluated in relation to changes in the overall quality of our child’s life.
64. Progress is evaluated in relation to my child’s development of new acquaintances and friendships.
65. AAC outcomes are examined in relation to my child’s developing functional skills to meet life demands.
66. There is an ongoing process for assessing our child’s and others’ satisfaction with the AAC system.
67. AAC outcomes are examined in relation to my child’s access to and meaningful participation in the general education curriculum.
68. Evaluations of the effectiveness of the AAC program include assessments of its impact on our child’s ability to control events affecting him/her (i.e., self-determination).
69. Data are collected regularly (e.g., once a week) on the effectiveness of the AAC program and possible needs for modification.
70. The speech-language pathologist reviews data collected by paraprofessionals and others involved in the AAC program as a basis for program modifications, in-service training, and other purposes.
71. Outcomes of AAC are assessed in classrooms and other natural environments.
72. Needs for improved communication are monitored and reassessed regularly since these may change over time.
73. Others’ uses of the AAC system, and associated supports they provide to my child, are monitored regularly and consistently.
74. There is a process in place to monitor the effectiveness with which my child and others use the AAC system over time and in different settings.
75. Evaluation procedures include ongoing observations of teachers’, paraprofessionals’, classmates’ and others’ patterns of interaction with our child, with and without the AAC system.
76. The AAC program includes ongoing assessment of factors that support (e.g., adequate staffing and other resources, and high expectations) or hinder (e.g., certain school policies and regulations, and negative attitudes) positive outcomes.

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Inventory of Best Practices in the Provision of AAC Services to Students With Severe Disabilities in Inclusive Education

Instructional Strategies

77. Rather than providing services in isolation, teachers and related service providers such as the speech-language pathologist are expected to work together, addressing multiple skills concurrently.

78. Teachers and other staff are taught how to foster my child’s success with the AAC system, including how to respond effectively to my child’s communicative attempts.

79. Others, including classmates and teachers, receive direct instruction on how to use the AAC system effectively with our child.

80. Teachers, paraprofessionals, and other staff receive the supports they need to acquire knowledge and skills necessary to implement the AAC program in classrooms and other environments.

81. Our child is learning to communicate through multiple means, rather than through the use of the communication aid alone. This may include any combination of high and low tech devices, gestures, vocalization, and other means.

82. Although it may be unlikely that our child will develop functional speech in the near future based on what we currently know, the AAC program continues to foster speech development (e.g., modeling speech, reinforcing my child’s use of vocalizations and word approximations) as part of a multimodal AAC system.

83. Some of the AAC skills targeted are ones we expect will continue to be useful to our child through adulthood. Some examples may include seeking assistance, requesting and providing information, and indicating preferences.

84. Our child is being taught to use AAC for multiple purposes that may include different types of requests (e.g., information, action, objects, attention, and clarification), commenting, answering, rejecting, and establishing or maintaining social relationships.

85. There are specific procedures in place to ensure the AAC system is in good working order most or all of the time.

86. Our child has ready access to the AAC system throughout the day.

87. The team understands our child’s AAC needs will change over time, as will available technology, and thus considers AAC systems that will parallel our child’s development of new skills over time.

88. When necessary, teachers and others are taught how to engineer, or modify, classrooms and other settings to increase our child’s opportunities and reasons to communicate.

89. Our child has opportunities to see classmates, other students, teachers, and others model effective uses of the AAC system in everyday environments.

90. Our child shows clear evidence he/she values using his/her AAC device in different situations.

91. There is little evidence of our child rejecting or abandoning the AAC system.