

similar to those presented in the present study; that is, social and self-determination skills were ranked highly, and academic and daily and community living skills were ranked lower (Agran & Alper, 2000). An expanded survey involving general educators would be of great value to conduct. Last, it remains unknown what specific problems the teachers may have experienced in their efforts to include their students in the general curriculum. Along these lines, 41% of the respondents indicated that their students were participating in the general curriculum either fully or in a modified manner. Determining how this was done would have been of great value to educators, but remains known at present.

In summary, the findings suggest that, despite the federal mandate to ensure access for all students, respondents do not believe it has much relevance for students with severe disabilities, and have done little to advance it. It is likely that the lack of a clear school policy and the failure to be involved in related planning have contributed to this situation. Further, the high ranks given to the social, communication, and self-determination skills areas and the relatively lower ranks for academic skills suggest that the skills the students are learning are not being referenced to the general curriculum (although, we would note, the general curriculum in most states or districts include these content areas). It is interesting to learn that many of the teachers indicated that their students' challenging behaviors represented a major burden to ensuring access. Regrettably, these teachers continue to believe that students need to "earn" their way into general education. In response to this, we hope that as the access initiative picks up more momentum and as districts have a clearer idea on how to achieve it, the planning and collaboration that will result will aid everyone in understanding that education is truly a shared responsibility, involving not two curriculums, but one sufficiently broad to address the needs of all students.

References

- Agran, M., & Alper, S. (2000). Curriculum and instruction in general education: Implications for service delivery and personnel preparation. *Journal of the Association for Persons with Severe Handicaps*, 25, 167-174.
- Billingsley, F. F., & Albertson, L. R. (1999). Finding a future for functional skills. *Journal of the Association for Persons with Severe Handicaps*, 24, 298-302.
- Bogdan, R., & Taylor, S. J. (1989). Relationships with severely disabled people: The social construction of humanness. *Social Problems*, 36(2), 135-148.
- Boundy, K. (2000). Including students with disabilities in standards based education reform. *TASH Newsletter*, 26(4), 4-21.
- Brown, L., Nietupski, J., & Hamre-Nietupski, S. (1976). Criterion of ultimate functioning. In M. A. Thomas (Ed.), *Hey, don't forget about me! Education's investment in the severely, profoundly, and multiply handicapped* (pp. 2-15). Reston, VA: Council for Exceptional Children.
- Chesley, G. M., & Calaluce, P. D., Jr. (1997). The deception of inclusion. *Mental Retardation*, 35, 488-490.
- Downing, J. E., Ryndak, D. L., & Clark, D. (2000). Paraeducators in inclusive classrooms: Their own perceptions. *Remedial and Special Education*, 21, 171-181.
- Federal Register. (1999, March 12). Washington, DC: US Government Printing Office.
- Fisher, D., & Sax, C. (1999). Noticing differences between secondary and postsecondary education: Extending Agran, Snow, and Swaner's discussion. *Journal of the Association for Persons with Severe Handicaps*, 24, 303-305.
- French, N., & Pickett, A. L. (1997). Paraprofessionals in special education: Issues for teacher educators. *Teacher Education and Special Education*, 20, 61-73.
- Kavale, K. (2000). *Inclusion: Rhetoric and reality surrounding the integration of students with disabilities*. Des Moines: Fine Foundation, the Iowa Academy of Education.
- Kavale, K. A., & Forness, S. R. (2000). History, rhetoric, and reality: Analysis of the inclusion debate. *Remedial and Special Education*, 21, 279-296.
- Kleinert, H. L., & Kerns, J. F. (1999). A validation study of the performance indicators and learner outcomes of Kentucky's alternate assessment for students with significant disabilities. *Journal of the Association for Persons with Severe Handicaps*, 24, 100-110.
- Knowlton, E. (1998). Considerations in the design of personalized curricular supports for students with developmental disabilities. *Education and Training in Mental Retardation and Developmental Disabilities*, 33, 95-107.
- Koegel, L. K., Koegel, R. L., & Dunlap, G. (1996). *Positive behavioral support: Including people with difficult behavior in the community*. Baltimore: Paul H. Brookes.

Promoting Access to the General Curriculum for Students with Mental Retardation: A Multi-Level Model

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Abstract: The 1997 amendments to the Individuals with Disabilities Education Act included requirements that students with disabilities have access to and progress in the general curriculum. Most discussions of efforts to promote such access and progress do not take into account the unique needs of learners with mental retardation. Wehmeyer, Lattin, and Agran (2001) introduced a decision-making model to enable IEP teams to make decisions about the educational program of students with mental retardation taking into account both the general curriculum and unique student learning needs. This article places that decision-making process into the context of other steps needed to ensure access for students with mental retardation, providing a multi-step and multi-level model to ensure access for students with mental retardation.

Ensuring that students with disabilities have access to the general curriculum was a key feature of the 1997 amendments to the Individuals with Disabilities Education Act. Those amendments included statutory and regulatory language pertaining to providing such access. Section 300.347(a) (3) in the IDEA requires that the IEP of students with disabilities include:

A statement of the special education and related services and supplementary aids and services to be provided to the child, or on behalf of the child, and a statement of the program modifications or supports for school personnel that will be provided for the child

- (i) to advance appropriate toward attaining the annual goals;
- (ii) to be involved and progress in the general curriculum;

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- (iii) to be educated and participate with disabled and non-disabled children.

While there are a growing number of efforts to conceptualize how to gain access to the general curriculum for students with disabilities, few of these have addressed the needs of learners with mental retardation and other cognitive disabilities. Wehmeyer, Lattin, and Agran (2001) introduced a decision-making model to enable IEP teams to make curriculum decisions pertaining to the educational program of students with mental retardation that takes into account both the general curriculum and a student's unique learning needs. However, making a decision about the student's formal curriculum is only one step in achieving the outcome that students with mental retardation both have access to and progress in the general curriculum. This article presents a multi-step process and multi-level model to gain access to and promote progress in the general curriculum for students with mental retardation and intensive support needs.

A Multi-level Model

Wehmeyer, Sands, Knowlton, and Kozleski (2002) identified five action steps to ensure that students with mental retardation progress in the general curriculum, listed in Table 1.

Figure 1 summarizes the key elements of

TABLE 1

Steps to Gaining Access to the General Curriculum for Students with Mental Retardation

<i>Action Step</i>	<i>Description</i>
Standard Setting and Curriculum Design	Standards are written as open-ended and the curriculum is planned and designed using principles of universal design that ensure that all students can show progress.
Individualized Educational Planning	The individualized planning process ensures that a student's educational program is designed based on the general curriculum, taking into account unique student learning needs.
School-wide Materials and Instruction	There is school-wide use of universally designed curricular materials and high quality instructional methods and strategies that challenge all students.
Partial School and Group Instruction	Groups of students who need more intensive instruction are targeted and building and classroom instructional decision-making activities focus at the lesson, unit, and classroom level to ensure students can progress in the curriculum.
Individualized Interventions	Additional curricular content and instructional strategies are designed and implemented to ensure progress for students with learning needs not met by school-wide efforts or partial school efforts.

this approach, which involves 3 levels of action (planning, curriculum, and instruction), 3 levels of the scope of instruction (whole school, partial school, and individualized), and 3 levels of curriculum modifications (adaptation, augmentation, and alteration). A brief description of each of the five steps to access indicated in Table 1 follows.

Step 1: Curriculum Planning and Design

The standards-based reform movement emphasizes the establishment of high standards and the alignment of curriculum and assessment with those standards. Thus, ensuring access to the general curriculum for students with mental retardation must begin with the curriculum planning and design process and the development of state and local standards. If students with widely varying skills, backgrounds, knowledge and customs are to progress in the general curriculum, the standards upon which the curriculum is based, as well as the curriculum itself, must embody the principles of universal design, discussed in greater detail subsequently, and be written to be open-ended and inclusive, not close-ended. The terms open- and close-ended refer to "the

amount of specificity and direction provided by curriculum standards, benchmarks, goals or objectives at both the building and classroom levels" (Wehmeyer, Sands, et al., 2002). Close-ended standards are specific and require narrowly defined outcomes or performance indicators, like "writing a 5 page paper on the history of the United States." Obviously, students who cannot write will be unable to meet this standard even if they could provide evidence the knowledge being assessed (e.g., history of the United States) through alternative means. If, on the other hand, the standard was written such that students could demonstrate knowledge of the history of the United States using other means of expression, it would be an open-ended curriculum target. Open-ended standards do not restrict the ways in which students exhibit knowledge or skills and focus more on the expectations that students will interact with the content, ask questions, manipulate materials, make observations, and then communicate their knowledge in a variety of ways (orally, through video tape, writing and directing a play, etc.). Research suggests that open-ended designs allow for greater flexibility as to what when and how topics will be addressed

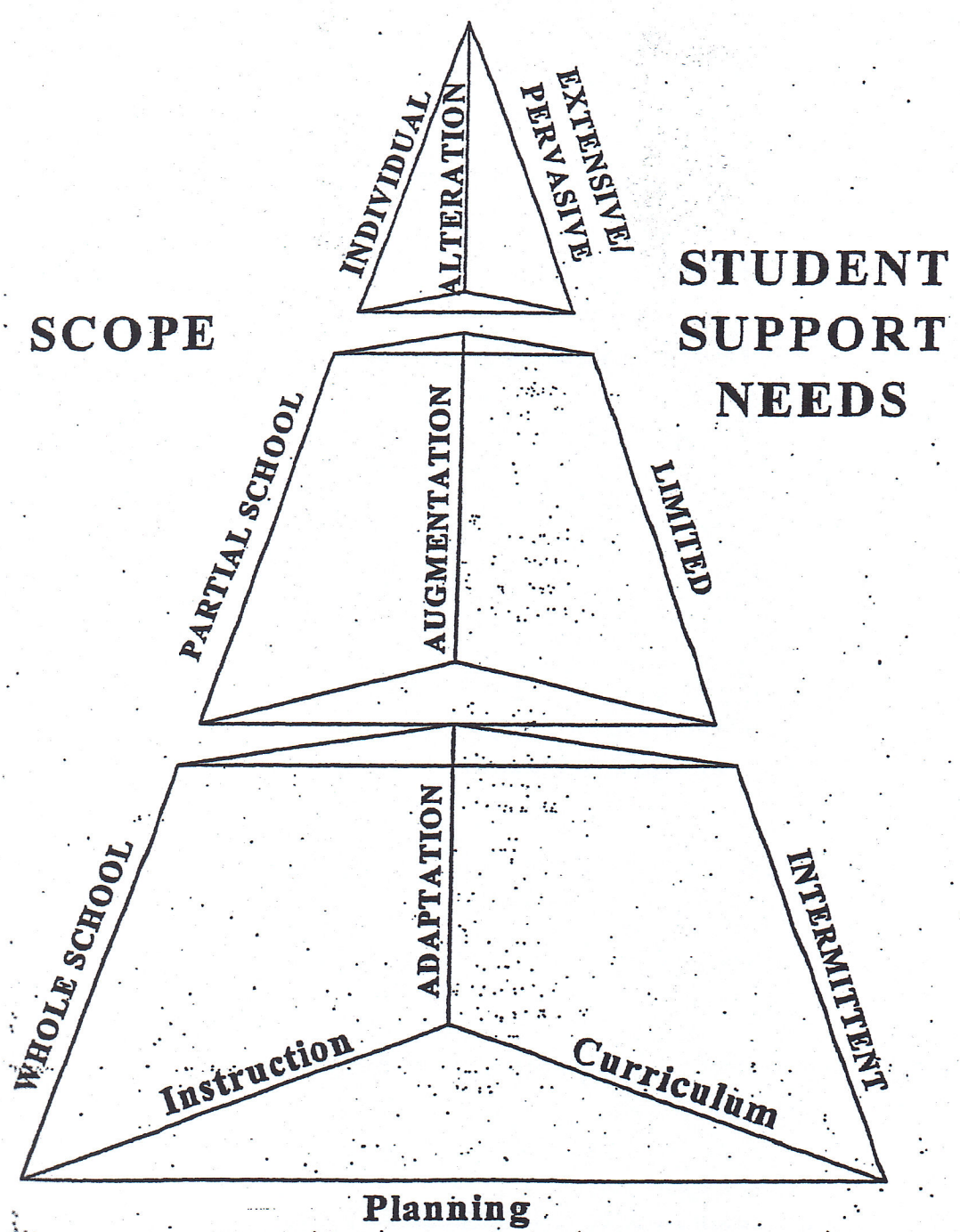


Figure 1. Multilevel focus for gaining access to the general curriculum (from Wehmeyer, Sands, Knowlton, & Kozleski, 2002).

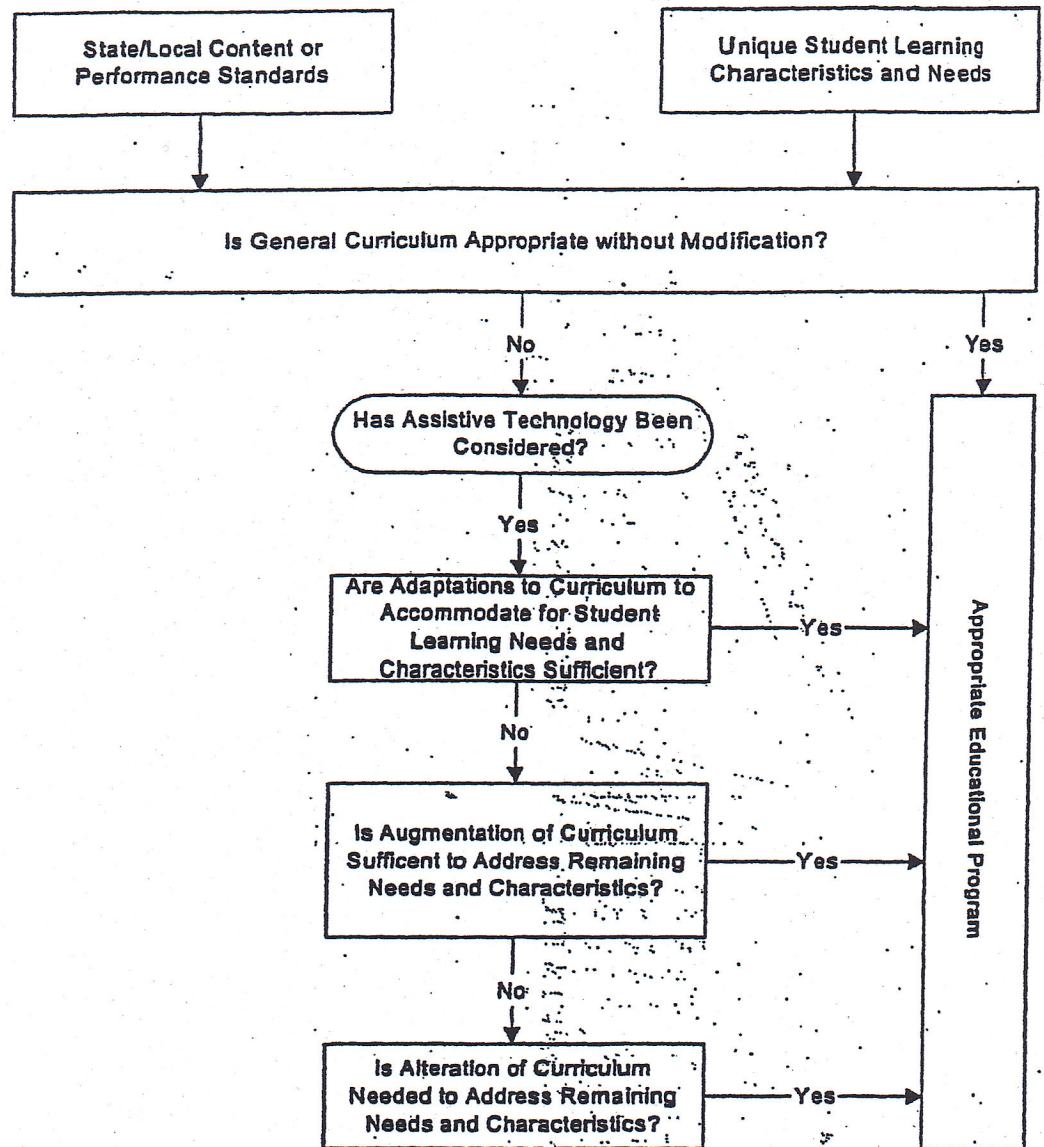


Figure 2. An individualized education planning process incorporating both the general curriculum and unique student needs (from Wehmeyer, Lattin, et al., 2001).

in the classroom (Stainback, Stainback, Stefanich, & Alper, 1996) and are more consistent with universally designed curriculum, ensuring that more students, including students with mental retardation, can show progress in the curriculum (Wehmeyer, Sands, et al., 2002). We will return to the issue of universal design in discussing curricular materials.

Step 2: Individualized Educational Planning

The education of students with disabilities has always emphasized the importance of individualized planning, a value that should not be abandoned when focusing on the general curriculum. Figure 2 (Wehmeyer, Lattin, et al., 2001) presents a decision-making model to

ensure that IEP teams begin educational planning with both knowledge of the general curriculum (standards and curriculum) for students who are the same age and grade level as the student for whom the IEP is being designed, as well as with information about unique student learning needs (based on input from multiple stakeholders and assessment sources). This model is detailed in Wehmeyer, Lattin, et al. (2001), so will only be summarized in this article. When considering a student's formal curriculum, it may be that some students can progress on portions of the general curriculum without accommodations or curriculum modifications and as such that portion of the general curriculum will be the "most appropriate" formal curriculum. It is likely, however, that most students with mental retardation or developmental disabilities will need some accommodations or modifications. To achieve that, the IEP team is first encouraged to consider how assistive technology can accommodate for student limitations and can enable the student to progress without curriculum modifications. Once assistive technology has been considered, teams consider three levels of curriculum modifications. The first is curriculum adaptation, which refers to efforts to adapt the curriculum's presentation and representation or the student's engagement with the curriculum (as discussed subsequently). A second level of modification is curriculum augmentation, where additional content is added to the curriculum to enable students to progress. Such efforts typically include teaching students additional 'learning-to-learn' or self-regulation strategies that, in turn, enable students to progress more effectively in the curriculum. Neither of these levels of curriculum modification changes the general curriculum content. The third level, curriculum alteration, does change the general curriculum to add content specific to students needs, which might include traditional functional skills or other needed skills not in the general curriculum. This also, presumably, necessitates the elimination of content in the general curriculum. For many students with mental retardation, the third level of curriculum modification (e.g., alternative curriculum) is where planning currently begins, but if students are to maximally benefit from and progress in the general curriculum, IEP teams

need to consider accommodations and curriculum adaptations and augmentations before considering alternative curricula. It is also evident that if the general curriculum is broad enough to cover functional areas, that will limit the need to move to an alternative curriculum.

Step 3: School-wide Materials and Instruction

The 1997 amendments to the IDEA emphasized school-wide interventions to provide greater access for all students. School-wide interventions are, quite simply, those that are implemented throughout the school campus and which benefit all students. With regard to students with mental retardation gaining access to the general curriculum, there are three school-wide interventions that warrant consideration.

School-wide implementation of high quality instructional strategies. The implementation of high-quality, empirically validated instructional strategies campus-wide is a critical feature of providing access for students with mental retardation. Too often, instructional strategies that benefit other students are not attempted with students who have mental retardation. Sometimes, the implementation of such strategies is simply, inadvertently, not considered. Of greater concern are those instances in which such an omission is erroneously based on the assumption that, because of the cognitive demands inherent in a particular strategy, it is not deemed "appropriate" for students who have mental retardation.

Generally, it is important to remember that just as alignment of curriculum, instruction, and assessment practices is central to a high quality educational program for students who do not have a disability (English, 1992), the same is true for students who do have a disability—including mental retardation. Instructional strategies that nurture the development of problem solving and critical thinking skills, as well as those that provide for active learning opportunities are important for all students. Conversely, the fact that many instructional strategies developed for the purpose of individualizing instruction for students who have a disability, including mental retardation, might well be of benefit to all students should not be overlooked. For example, schools would be

well advised to consider the implementation of data-based decision making—the deliberate revision of daily instruction in accordance with student performance data collected on an ongoing basis (Farlow & Snell, 1995), throughout their campuses.

During the course of any given school day, a teacher will utilize a variety of instructional groupings or arrangements (e.g., whole class instruction, teacher-directed small group instruction, cooperative learning groups, peer-directed instructional activities, independent seat work) through which to present lesson content. For students with mental retardation (indeed students with disabilities in general), “whole-class and independent seat work arrangements often pose the most problems” (Udvari-Solner, 1993, p.4). Large group instruction and independent seatwork require all students to maintain attention over extended periods of time, interact only passively with the information to be learned, and to self-reliantly receive and process information that is presented in the same manner. To increase the likelihood that students who have mental retardation will truly have access to the general curriculum, teachers should be encouraged to diversify their selection of instructional arrangements and not rely solely on these two strategies.

Inherent in the idea of designing instruction that allows opportunities for all students to be actively involved in assigned work tasks to the greatest meaningful extent possible is the practice of differentiated instruction. Differentiated instruction involves a teacher implementing a wider range of learning methodologies, increasing students' accessibility to instructional materials in a variety of formats, expanding test-taking parameters, and varying the complexity and nature of content presented during the course of a unit of study. “(T)he curriculum does not always need to be modified—even when considering students with more significant disabilities. . . . Differentiating instruction allows the students a variety of ways to demonstrate knowledge while continuing to meet the standards and requirements of the class” (Castagnera, Fisher, Rodifer, & Sax, 1998, p. 21)—that is, while continuing to access the general education curriculum.

Research has demonstrated that teachers can

effectively differentiate curricular content, the instructional process, product requirements, and/or assessment practices to facilitate students' access to, and success within, the general curriculum (Kronberg, 1999). Curricular content differentiation might involve applications as straightforward as reducing the number of math problems assigned to certain students in an elementary class, or affording students the choice of taking a weekly spelling pre-test to opt out of spelling for a particular week. Individualized differentiations of content can, also, be achieved by restructured concept-based teaching; in partnership with hierarchical questioning techniques, this approach can result in a larger number of students meaningfully participating in a lesson drawn from the general curriculum. Kronberg (1999) refers to the utilization of “fat” and “skinny” questioning techniques (i.e., “skinny” questions are those that require a one-word or yes or no answer; “fat” questions require expanded answers, such as synthesis or evaluation of information presented) as an effective vehicle for involving a class of students of diverse abilities in class discussion.

Differentiating the instructional process can be accomplished through a myriad of techniques that themselves should be implemented school-wide to the benefit of all students, including providing visual or graphic organizers to accompany oral presentations; incorporating the use of models, demonstrations, or role play; utilizing teacher presentation cues (e.g. gestural, visual, or verbal) to emphasize key points; scaffolding key concepts to be learned; and getting students more actively involved in the learning process, through the implementation of every pupil response techniques (e.g., lecture response cards, thumbs up/thumbs down) or the incorporation of manipulatives for student use (Janney & Snell, 2000; Kronberg, 1999; Udvari-Solner, 1993).

In addition to the efficacy of these more direct instructional strategies, research has demonstrated empirical validation of a number of ecological or environmental adaptations to the physical conditions in which learning is to take place that can be applied in order to facilitate the access of students with mental retardation to the general curriculum.

It is commonly accepted that the environmental context of the school and classroom

affects students' abilities to acquire information and demonstrate what they have learned. Adaptation of environmental conditions for students with mental retardation enables them to better attend to and cope with the multitude of demands that typify an ongoing stream of instruction in the classroom (Ault, Guy, Guess, Bashinski, & Roberts, 1995; Janney & Snell, 2000; Siegel-Causey & Bashinski, 1997; Udvari-Solner, 1993). The most obvious ecological modifications are those made with students who have sensory impairments in mind. The sensory characteristics of a learning environment (e.g., lighting, glare, noise level, movement requirements), just as the modalities of instructional materials, affect other students as well, however, including non-disabled students.

Positive behavior supports. A second school-wide emphasis is the implementation of positive behavior supports. Carr et al. (2000) over-viewed the literature pertaining to positive behavior interventions and supports. These authors, noting that problem behaviors like aggression, self-injury or tantrums have been barriers to the successful integration and inclusion of some people with cognitive and developmental disabilities, stated that the goal of positive behavior support is to apply behavioral principles in the community in order to reduce problem behaviors and build appropriate behaviors that result in durable change and a rich lifestyle" (p. 3). The foundations of positive behavior supports (PBS), these authors noted, were in early efforts to apply behavioral principles to improve the lives of children with severe problem behaviors, with particular focus on the role of the functional assessment process to guide the development of behavioral interventions. Positive behavior supports focus on two primary modes of intervention, altering the environment before a problem behavior occurs and teaching appropriate behaviors as a strategy for eliminating the need for problem behaviors to be exhibited (Carr et al., 2000).

Significantly for educators, positive behavior supports have focused considerable attention on addressing problem behaviors in school settings and in addressing school violence (Horner, Albin, Sprague, & Todd, 2000; Sugai & Horner, 1994; Turnbull & Turnbull, 2001; Warren, Edmonson, Turnbull, Sailor,

Wickham, & Griggs, 2000) by providing interventions at an individual, classroom or whole-school level. Positive behavior support has been demonstrated to reduce office referrals in schools, create classroom environments more conducive to learning, and assist students with behavior problems to improve their behavior. Positive behavior support involves application of behaviorally based approaches to enhance the capacity of schools, families, and communities to design environments that improve the fit or link between students and the environments in which teaching and learning occurs. Attention is focused on creating and sustaining school environments that improve lifestyle results (personal, health, social, family, work, recreation, etc.) for all children and youth by making problem behavior less effective, efficient, and relevant, and desired behavior more functional (Wehmeyer, Wickham, & Sailor, 2000). Additionally, we would suggest, such school-wide efforts create a learning climate in which all children have the opportunity to learn.

Universal design. The third school-wide focus is that of ensuring that educational materials used in school incorporate the principles of universal design. Since this has become a focal point for attention in the area of gaining access to the general curriculum, it is worth examining this issue in greater detail.

Orkwis and McLane (1998) defined 'universal design for learning' as "the design of instructional materials and activities that allows the learning goals to be achievable by individuals with wide differences in their abilities to see, hear, speak, move, read, write, understand English, attend, organize, engage, and remember" (p. 9). The onus is on curriculum planners and designers to employ principles of universal design to ensure that students with a wide range of capacities can access, advance, and succeed in the curriculum.

Researchers at the Center for Applied Special Technology (CAST; 1998-1999) suggested three essential *qualities* of universal design for learning. These qualities are that the curriculum is designed to: (1) provide *multiple representations* of content; (2) provide *multiple options for expression* and control; and (3) provide *multiple options for engagement* and motivation.

1. Curriculum provides multiple means of repre-

sentation. Researchers at CAST suggested that "universally designed materials accommodate this diversity through alternative representations of key information. Students with different preferences and needs can either select the representational medium most suitable for them, or gather information from a variety of representational media simultaneously." World Wide Web pages designed to be accessible present an example of using multiple means of representation. One of the benefits of the WWW over traditional mediums is the capacity to use graphic images in a variety of ways; from icons to hyperlinked pictures to streamed video. However, for a person who is blind or visually impaired who is using a text-reader to access the site, graphic depictions may make the site and the information contained therein inaccessible. As an alternative, accessible web sites include text descriptions of images and pictures. Similarly, the design of curricular materials should include multiple representations of important topics, features, or points. Such multiple representations include a variety of methods of presentation of the material based on learner needs and characteristics. Students with mental retardation, for example, need print-based information presented with graphic depictions, free from unnecessary clutter and with key information repeated or highlighted.

2. *Curriculum provides multiple means of expression.* CAST researchers noted that the dominant means of expression used in schools has been written expression. However, there are a variety of ways of student responding that could indicate progress, including "artwork, photography, drama, music, animation, and video," (CAST, 1998-1999) that would enable students to express their ideas and their knowledge. Once again, technology promises to provide avenues for expression that have, heretofore, been unavailable.

3. *Curriculum provides multiple means of engagement.* Student engagement in learning has long been an indicator of motivation in the classroom. By the utilization of multiple representation and presentation modes, particularly those that involve digital representation of knowledge which are graphically-based and incorporate video, audio and other multimedia components, student engagement, and as such student motivation, can be enhanced.

Universally designed curriculum takes into account individual student interests and preferences and individualizes representation, presentation and response aspects of the curriculum delivery accordingly. Current technologies allow that level of individualization and, thus, provide greater flexibility in ways for the student to engage in learning (CAST, 1998-1999).

Universal design should be distinguished from simply using assistive technology to provide access to the general curriculum for students with mental retardation. The use of assistive technology comes *after* curriculum materials have been made and, in most cases, after teachers have planned instruction. The major advantage to universal design for learning is that it takes place before materials are made and teachers decide how to teach. Access is built-in from the beginning, thus eliminating the need for many time-consuming adaptations or purchase of expensive assistive technology devices (Bowe, 2000; CAST, 1998-1999).

Examining some of the seemingly neglected principles of universal design is critical to a discussion of the applicability of universal design to the education of students with mental retardation. Most people think of universal design only as captioning videos, offering documents so that students can change the font face, size and color, or providing texts on computer disks so that students can listen to them through screen reading software. Providing flexible materials is certainly an important part of universal design for learning. However, for students with mental retardation to succeed in accessing the general curriculum, educators must apply the principles of universal design to other aspects of the learning experience, including their teaching routines. Based on Bowe's (2000) examination of the principles of universal design (which emerged from architecture and technology design) as they applied to education, Lance and Wehmeyer (2001) developed a list of principles (Table 2) for use in evaluating the degree to which instructional materials incorporate principles of universal design. Our purpose here is to expand the discussion about universal design by examining how teachers might incorporate these principles to increase

TABLE 2

Principles of Universal Design Applied to Education (Lance & Wehmeyer, 2001)

<i>Principle</i>	<i>Explanation</i>
Equitable Use	Materials can be used by students who speak various languages, address a variety of levels in cognitive taxonomies, provide alternatives that appear equivalent and, thus, do not stigmatize students.
Flexible Use	Materials provide multiple means of representation, presentation and student expression.
Simple and Intuitive Use	Materials are easy to use and avoid unnecessary complexity, directions clear and concise, examples provided.
Perceptible Information	Materials communicate needed information to user independent of ambient conditions or users sensory abilities, essential information highlighted and redundancy included.
Tolerance for Error	Students have ample time to respond, are provided feedback, can undue previous responses, can monitor progress, and are provided adequate practice time.
Low Physical and Cognitive Effort	Materials present information in chunks that can be completed in a reasonable time frame...

access to the curriculum for students with mental retardation.

1. *Principle One: Equitable Use.* The equitable use principle in universal design proposes that the "design" (traditionally referring to the design of a building or the design of assistive technology) be useful and marketable to people with a diverse array of needs. In the context of educating students with mental retardation, this principal proposes that standards, curriculum, instructional interventions and educational materials be "designed" so that they can be used by students with diverse abilities. One feature of equitable use is that to the largest degree possible designs should incorporate features that are necessary for people with disabilities, but which benefit everyone. Thus, as adapted materials are made available to students with disabilities, there is a need to ensure that they appear as similar as possible to materials that their peers are using as possible. One reason that there is an emphasis on designs that benefit everyone is to avoid stigmatizing or segregating people who need the universal design feature (Bowe, 2000). If students feel singled-out or stigmatized, they may not be motivated to use the materials, independent of whether those materials are effective or not. As such, if a student needs a text in electronic form, on audio tape, or one that is written at a lower reading level,

it might be wise to let students have the standard book to carry and refer to during class discussions. A better solution, more consistent with school-wide interventions, would be to let all students choose the version of the text with which they are most comfortable or have access to all versions.

2. *Principle Two: Flexibility in Use.* The principle of flexible use suggests that the design should appeal to a wide range of user preferences and abilities. In relation to education, this principle refers to the need to accommodate for a wide range of individual learning preferences and abilities. This principle generally receives the primary focus in discussions of universal design for learning, probably because it is compatible with other student-centered approaches education, including emphasis in issues of self-determination and student-directed learning (Wehmeyer, Agran, & Hughes, 1998; Wehmeyer & Sands, 1998). In their explorations of universally designed learning, researchers at CAST (1998-1999) emphasized the need for students to have access to materials in various modalities and levels of complexity, engage in different learning activities, and be allowed to demonstrate knowledge through multiple means. Considering the "flexibility in use" principle in material design and instructional planning will contribute to providing access to the general

curriculum for students with mental retardation. However, most of the research demonstrating the effectiveness of such flexibility has not included students with mental retardation and, as such, there is a need to examine these issues with that population.

3. Principle Three: Simple and Intuitive Use. This principle refers to the need to design buildings or technology for easy use, independent of a user's previous experience, knowledge and ability, language skills or other factors. With regard to its application to the education of students with mental retardation, materials and interventions should be designed so that directions are explicit and easily understood, with steps for success clearly communicated in discrete, manageable steps. For example, to facilitate the success of students with mental retardation in tasks related to the general curriculum in line with the "simple and intuitive use" principle, teachers should pair written instructions for materials completion with an oral overview of the task, should model the task or work through sample problems, and provide picture cues for the steps in a task if possible. Advance organizers, for example, are an instructional strategy that can be implemented school-wide that provide the type of information needed to succeed and contribute to 'simple and intuitive use. Bowe (2000) identified the strategy of giving students study guides so that they know what information they should focus on when reading and providing study guides for exams as means to simplify use.

4. Principle Four: Perceptible Information. This principle refers to the need to design features so that information needed for use is available and perceptible, independent of environmental conditions or the user's sensory abilities. Most people probably have, at one time or another, struggled to turn off an unfamiliar alarm clock (e.g., at a hotel) in the dark and, in the process, come to a fuller understanding of how often technology in our daily lives violate both the simple and intuitive use and perceptible information principles! As it applies to the education of students with mental retardation, curriculum and instructional design should incorporate different modes of presentation and representation, including graphic, audio, or tactile presentation and

representation, as discussed by the CAST features of universal design, to ensure that student perceptual limitations, whether they result from sensory, cognitive or attention deficits or impairments. For example, Bowe (2000) noted, instruction must be presented in "digestible" chunks with the most important information repeated throughout the lesson in as many modes as possible.

5. Principle Five: Tolerance for Error. One focus of universal design is to minimize the negative consequences resulting from errors. That is, the design tolerates errors or misuse. In education, this means that students can make mistakes and still complete the activity and achieve success. Error can be a function of the student's capacity to complete the exercise or task successfully, certainly, but also may be related to temporal or other issues. For example, a computer software program intended to teach reading that has timed intervals in which students must respond may unintentionally limit learning opportunities for students who need more time to respond. This feature of universal design is not often highlighted in discussions around its application to education, but may be particularly important to students with mental retardation and cognitive disabilities.

6. Principle Six: Low Physical Effort. In universal design as applied to assistive technology, this principle refers to ensuring that designs "can be used efficiently and comfortably and with a minimum of fatigue" (Bowe, 2000, p. 40). Universally designed technology devices are those that can be used by people who have limits to physical stamina or capacity. One of the reasons that the angles at which ramps leading into buildings are specified by federal law is to ensure that they are navigable by people who use wheelchairs (or a walker/stroller or cane) who have limits to their physical strength and endurance. Certainly physical stamina is less of an issue in education, but curriculum designers do need to keep in mind that some students, with and without mental retardation, who also have physical disabilities or poor visual-spatial skills may need to have these features considered if they are to succeed. We might also recommend that these issues of fatigue be extended to cognitive and psychological fatigue as well, making sure that instructional sessions fit the attention capaci-

ties of students, and alternating between easy and difficult tasks.

7. *Principle Seven: Size and Space for Approach and Use.* The final principle in universal design emphasizes that there is appropriate space and that spaces are accessible so that students can physically access materials and learning activities.

These principles of universal design can (and most likely should) be applied to standard-setting, curriculum design and planning, and instruction to ensure that all students are better able to access the curriculum and, we suggest, benefit from that curriculum.

Step 4: Partial School or Group Instruction

Even when school-wide efforts are in place, there will be students who do not progress without additional supports. The next level of intervention is at the group level, where more targeted interventions are designed and implemented for smaller groups of students. This includes classroom-level instructional decisions that focus on lesson and unit design so that all students in the class will progress, as well as specific learning experiences for groups of students. In order to adhere to school behavior rules, for example, 9th grade students who recently transitioned to high school might need specific opportunities to learn what is expected of them when going from class to class.

Step 5: Individualized Interventions

For a small group of students, including many students with mental retardation, there will be a need to design highly individualized and intensive interventions to enable them to succeed. This is also the group that will likely need alternative curriculum options. However, these students should also be involved in school-wide interventions and engaged in learning activities driven by the general curriculum.

Summary

The intent of the IDEA access to the general curriculum mandates was to ensure that all students with disabilities have access to and benefit from a challenging curriculum and

are held to high standards and expectations. If this is to be an outcome achieved by students with mental retardation, educators and other stakeholders in the education process need to focus on every aspect of the education process, from the planning and design of curriculum and standards, the implementation of such curriculum and standards at the building and campus level, the educational decision-making process, and the design and implementation of instruction. Materials will need to take into account all aspects of universal design, and there will need to be school-wide and partial-school interventions and instructional activities. In the end, it is likely that such efforts will not only ensure that students with mental retardation gain access to the general curriculum, but that all students benefit

References

- Ault, M. M., Guy, B., Guess, D., Bashinski, S., & Roberts, S. (1995). Analyzing behavior state and learning environments: Application in instructional settings. *Mental Retardation, 33*, 304-316.
- Bowe, F. G. (2000). *Universal design in education: Teaching nontraditional students*. Westport, CT: Bergin & Garvey.
- Carr, E. G., Horner, R. H., Turnbull, A. P., Marquis, J. G., McLaughlin, D. M., McAtee, M. L., Smith, C. E., Ryan, K. A., Ruel, M. B., & Doolabh, A. (2000). *Positive behavior support for people with developmental disabilities: A research synthesis*. Washington, DC: American Association on Mental Retardation.
- Castagnera, E., Fisher, D., Roediger, K., & Sax, C. (1998). *Deciding what to teach and how to teach it: Connecting students through curriculum and instruction*. Colorado Springs, CO: PEAK Parent Center, Center for Applied Special Technology (CAST; 1998 - 1999). The National Center on Accessing the General Curriculum [On-line]. Available: http://www.cast.org/initiatives/national_center.html
- English, F. (1992). *Successful schools series: Vol. 4. Deciding what to teach and test: Developing, aligning, and auditing the curriculum*. Newbury Park, CA: Corwin Press.
- Farlow, L., & Snell, M. E. (1995). *Making the most of student performance data. (AAMR Research in Practice Series)*. Washington, DC: American Association on Mental Retardation.
- Horner, R. H., Albin, R. W., Sprague, J. R., & Todd, A. W. (2000). Positive behavior support. In M. E. Snell & F. Brown (Eds.), *Instruction of students with*

- severe disabilities. (5th ed., pp. 207-244). Upper Saddle River, NJ: Merrill Publishing.
- Janney, R., & Snell, M. E. (2000). *Teachers' guides to inclusive practices: Modifying schoolwork*. Baltimore: Paul H. Brookes.
- Kronberg, R. (1999, March). *Creating and nurturing inclusive school communities*. Paper presented at the 5th Mid-West Regional Conference on Inclusive Education, Omaha, NE.
- Lance, G. D., & Wehmeyer, M. L. (2001). *Universal design checklist*. Lawrence, KS: Beach Center on Disability, University of Kansas.
- Orkwis, R., & McLane, K. (1998). *A curriculum every student can use: Design principles for student access*. ERIC/OSEP Topical Brief, Fall, 1998. Reston, VA: Council for Exceptional Children.
- Siegel-Causey, E., & Bashinski, S. M. (1997). Enhancing initial communication and responsiveness of learners with multiple disabilities: A tri-focus framework for partners. *Focus on Autism and Other Developmental Disabilities, 12*, 105-120.
- Stainback, W., Stainback, S., Stefanich, G., & Alper, S. (1996). Learning in inclusive classrooms: What about the curriculum? In S. Stainback & W. Stainback (Eds.), *Inclusion: A guide for educators* (pp. 209-219). Baltimore: Brookes.
- Sugai, G., & Horner, R. H. (1994). Including students with severe behavior problems in general education settings: Assumptions, challenges, and solutions. In J. Marr, G. Sugai, & G. Tindal (Eds.), *The Oregon Conference monograph 6* (pp. 102-120). Eugene: University of Oregon.
- Turnbull, A. P., & Turnbull, H. R. (2001). Extending a school-wide approach of positive behavior interventions and support to families and the community. *Families, professionals, and exceptional-ity: Collaborating for empowerment* (4th ed.) Upper Saddle River, NJ: Merrill Prentice Hall.
- Udvari-Solner, A. (1993). *Curricular adaptations: Accommodating the instructional needs of diverse learners in the context of general education*. Topeka, KS: Kansas State Board of Education.
- Warren, J. S., Edmonson, H. M., Turnbull, A. P., Sailor, W., Wickham, D., & Griggs, P. (2000). *School-wide application of positive behavioral supports: Implementation and preliminary evaluation of PBS in an urban middle school*. A manuscript submitted for publication.
- Wehmeyer, M. L., Agran, M., & Hughes, C. (1998). *Teaching self-determination to students with disabilities: Basic skills for successful transition*. Baltimore: Paul H. Brookes.
- Wehmeyer, M. L., Lattin, D., & Agran, M. (2001). Achieving access to the general curriculum for students with mental retardation: A curriculum decision-making model. *Education and Training in Mental Retardation and Developmental Disabilities, 36*, 327-342.
- Wehmeyer, M. L., & Sands, D. J. (1998). *Making it happen: Student involvement in education planning and decision-making*. Baltimore: Paul H. Brookes.
- Wehmeyer, M. L., Sands, D. J., Knowlton, H. E., & Kozleski, E. B. (2002). *Teaching students with mental retardation: Accessing the general curriculum*. Baltimore: Paul H. Brookes.
- Wehmeyer, M. L., Wickham, D., & Sailor, W. (2000). *A whole school model of positive behavior interventions and supports and access to the general curriculum*. An unpublished grant proposal.

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