

Evidence-Based Practices for Special Education Teachers: A Review of Current Literature

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Article Info	Abstract
<i>Article History</i>	<p><i>The overarching objectives of this review were to aid teachers of students with disabilities in determining EBPs by identifying what current research details as the process and criteria applicable to the practice selection process. In addition, the review sought to elaborate the recommendations of contemporary literature regarding some of the notable EBPs that currently feature in special educational settings. Accordingly, the thematic analysis herein generated four sets of criteria by which special educators can evaluate the basis of evidence underpinning a practice under consideration, namely: the research designs, quality, and quantity of supporting studies; and the magnitude of effect associated with the given practice. Moreover, the review explored, thematically, the current EBP recommendations regarding how to teach, what to teach, and how to support students with disabilities. Systematic instruction, self-directed learning, and peer-tutoring emerged as the most notable EBPs relating to how to teach. Additionally, the review established the feasibility of specific EBPs to specific content areas, including reading-alouds for the language arts, time delays for teaching academic vocabulary, and graphic organizers for teaching mathematical concepts. Finally, the analysis established that collaborative teaming is a potential evidence-based intervention for supporting the educational and social achievements of students with disability.</i></p>
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Introduction

Teachers of students with disabilities require evidence-based insight concerning the specific approaches that work with learners, particularly when the said approaches are appraised in terms of the characteristics of disability to which they are applicable; the learners' personal needs; and related students' skill deficits and strengths. Researchers, instructors, and school administrators have, over the past decade, focused increasingly on the identification and implementation of evidence-based practices (EBPs) (Cook, Haggerty, & Smith, 2018). The educational policies of most countries around the world have also shifted systematically to reflect this self-evident need. In the United States, for example, the Individuals with Disabilities Act of 2004 and the 2001 No Child Left Behind Act mandated the execution of instructional paradigms that are founded on scientific research (Webster, 2019).

Extant literature on EBP in the context of special education defines it as an instructional technique designed to achieve specific pre-conditions prescribed by various research design paradigms, and as an approach that presents the greatest opportunities to bolster the achievement of meaningful outcomes by students with disabilities (Cook et al., 2018). Additionally, there exists a well-established body of research indicating that EBPs have four inherent characteristics (Scheeler, Budin, & Markelz, 2016; Spooner et al., 2019) including, firstly, the fact that they are not guaranteed to work for every learner with disability. Secondly, EBPs present unique and notable challenges in their implementation on a broad scale. Thirdly, they do not constitute the sole variable taken into account in instructional decision-making and, fourthly, they are often underpinned by varying standards and prerequisites and may therefore result in confusion as to what can be considered and what cannot be considered an EBP.

Accordingly, this paper seeks to present a comprehensive thematic analysis of the content of contemporary research on EBPs in special education. The overarching objectives of this review are, firstly, to aid teachers of students with disability in identifying the criteria that are critical to the evaluation of the evidence basis of a given practice. Secondly, the review seeks to provide the latest guidance on the recommended EBPs for students with severe disabilities, including guidelines on how to teach, what to teach, and how to support the said learners.

Literature Analysis

Criteria for Determining EBPs

Current literature that is drawn from education and related disciplines offers a wide spectrum of approaches and organizations for the identification of EBPs. Each approach presents research consumers with its own perspective of the criteria that a practice must satisfy for it to be considered evidence-based. However, the provisions of the said approaches tend to coalesce around a set of four universal criteria, namely the magnitude of effect that a practice demonstrates within supporting studies, the quality of research, the research design, and the quantity of research (Cook et al., 2018; Russo-Campisi, 2017). The vast majority of extant studies thus define EBPs as practices that demonstrate sufficiency and validity in meeting the four criteria aforementioned.

Regarding the criterion of research design, a practice is considered evidence-based within the context of special education if it is supported by studies from which research consumers can make an inference about causality. Scholars recommend that instructors of students with disabilities utilize studies featuring single subjects, quasi-experiments, and group experiments in their determination of EBPs (Webster, 2019). These studies enable the instructor to determine whether the practice as an independent variable causes a change in the dependent variable of student outcomes (Wang & Lam, 2017). Using studies with research designs that facilitate inferences regarding causality allows the instructor to rule out alternative causes other than the practice under evaluation.

Secondly, even with the desired research design, studies of poor quality may be limited in terms of the validity of the results that they generate. Therefore, current research recommends that instructors pay particular attention to the requirement that EBP supporting studies achieve pertinent quality indicators (Hudson et al., 2016). Williamson et al. (2019) recommend that the group experimental and quasi-experimental studies, which educators of students with disabilities utilize to support their determination of EBPs, must meet nine out of ten of the specified quality indicators required of the two research designs. Similarly, the recommendation to teachers using group studies to determine the evidence basis of a practice in special education is that the group studies must meet at least four out of the eight quality indicators required of that research design (Cook et al., 2018). Single-subject studies, on the other hand, must meet all of the twenty-one quality prerequisites that are proposed for the single-subject research design (Reichow, 2016). Generally, the methodological rigor of research is a critical variable for special educators to consider as they appraise the studies necessary to determine whether a practice under analysis is sufficiently evidence-based.

Thirdly, the current literature shows that one of the most important points to note during the process of determining the appropriate EBPs in the special education context is that the confidence in scientific research is never absolute. However, the convergence of research findings from multiple studies strengthens the certainty that special educators can accord to specific hypotheses and propositions regarding a practice being evidence-based. Accordingly, the identification of EBPs must not be based on a single study but, rather, be achieved on the basis of multiple, high-quality studies, which demonstrate practicable improvements with respect to student outcomes (Russo-Campisi, 2017). For example, special educators using quasi-experimental or group-experimental research to determine the evidence basis of a particular practice must undertake an analysis of at least two and four supporting studies, respectively (Spooner et al., 2019). Scholars also offer other alternatives for achieving the appropriate quantity of studies to support EBPs in special education, including the requirement of a specific maximum number of studies showing indeterminate or negative effects relating to a particular practice (Scheeler et al., 2016). Another qualification may be a minimum number of researchers who conducted the studies under appraisal, and a minimum number of different geographical locations where the practice is replicated (Ledford et al., 2016). Broadly, special educators are best served by giving particular consideration to recommendations regarding the appropriate quantity of studies to utilize in supporting the evidence basis of a practice under examination.

Fourthly, EBPs must demonstrate robust positive and valid effects on the outcomes of students with disabilities. The weighted effect size, in this regard, should be significantly higher than zero in the underlying supportive studies (Spooner et al., 2019). An additional criterion against which to evaluate the magnitude of a practice's effect, according to Hudson et al. (2016), is to appraise the supporting studies for the demonstration of socially important student outcomes, post-intervention. In the education context, a practice should only be considered evidence-based if there is a substantial body of evidence amassed through a scientific process.

How to Teach

Several approaches to the instruction of learners with severe disabilities have emerged over time as effective EBPs when appraised against the criteria delineated in the previous section of the paper. Because of this review's limited scope, this paper shall elaborate upon three notable ones, namely systematic instruction, self-directed learning, and the use of peer tutors.

Firstly, the use of peer tutoring as an instructional strategy is supported by a robust and strong body of empirical evidence linking it to a wide variety of academic and social benefits (Webster, 2019; Cook et al., 2018). This practice, as currently implemented across a diverse range of content areas and settings, typically

involves the delivery of instruction to students with disabilities by a same-age student drawn from a general education classroom (Webster, 2019). It can also involve training a designated group of peers in the delivery of instruction to specific or all learners in a class. Some of the evidence-based benefits associated with this instructional approach, as demonstrated by multiple studies, include positive achievements in skill development, particularly among the peer tutors (Williamson et al., 2019). Studies also indicate that the approach generates empirical benefits in promoting learners' academic engagement and social interaction (Cook et al., 2018). Broadly, therefore, peer tutoring enjoys a substantial body of literature supporting it as an EBP in the context of students with severe disabilities.

Contemporary research equally highlights the need for complementing teacher-delivered instruction with opportunities for self-directed learning in the context of students with severe learning disabilities. Notably, pictorial self-instruction and the Self-Determined Learning Model of Instruction (SDLMI) are two self-directed instructional strategies with robust research support, which indicates the suitability of the strategies as EBPs for students with disabilities (Webster, 2019; Wang & Lam, 2017). Specifically, studies show that pictorial self-instruction is effective in aiding students with autism to accomplish their academic tasks more efficiently by use of graphic planners and organizers (Webster, 2019). Remarkable improvements are also associated with the SDLMI in bolstering the achievement of learning outcomes among students with severe learning disabilities, by intervening- positively- in their abilities to set goals, take actions, and undertake effective planning (Wang & Lam, 2017). There is a sufficient body of evidence, therefore, supporting the implementation of self-directed learning strategies as EBPs in special education.

Thirdly, systematic instruction has more than sixty years of research evidence supporting its effectiveness in improving teaching and learning within the sub-population of students with moderate to severe intellectual disabilities (Hudson et al., 2016; Russo-Campisi, 2017). For example, the time delay strategy of systemic instruction is proven empirically to be highly effective in teaching word and picture recognition to students with severe intellectual disabilities (Russo-Campisi, 2017). It has also been shown to enhance the same student sub-population's acquisition of vocabulary across a range of content areas including history, foreign languages, and science (Hudson et al., 2016). Generally, extant research consistently demonstrates that various strategies that are included under systemic instruction, including time-delay, prompting, and generalization qualify to be conceptualized as EBPs.

What to Teach

Over the past two decades, special educators have focused their emphasis specifically on extending EBP interventions to grade-aligned content standards. These efforts have, in turn, resulted in the emergence of a strong body of research that links specific EBPs to specific content areas. Notably, there is sufficient evidence supporting the implementation of read-alouds as EBPs for improving the outcomes of students with disabilities in the specific content area of language arts (Ledford et al., 2016; Scheeler et al., 2016). Research shows that when special educators use read-alouds for instruction in reading comprehension among both learners with moderate to severe intellectual disability and those with visual impairments, the students achieve an enhanced understanding of the text, as measured by the accuracy of their answers (Ledford et al., 2016). Some studies also suggest that read-alouds can help students with moderate to severe disabilities achieve autonomous reading skills (Scheeler et al., 2016). In mathematics, emerging research evidences the validity of graphic organizers and familiar stories as EBP interventions for improving the performance of students with moderate to severe intellectual disabilities and those with autism spectrum disorders in algebra, geometry, data analysis, and computation (Spooner et al., 2019). High-quality studies also demonstrate that graphic organizers can improve the ability of students with autism spectrum disorder to acquire content in the subject area of science (Spooner et al., 2019). Other EBPs shown to be beneficial for the learning process of students with disabilities in the field of science are hands-on experiments and directed inquiry, when both are combined with training in vocabulary (Reichow, 2016). Special educators can achieve the said vocabulary training by using other complementary EBPs, particularly the aforementioned peer tutoring and time delay.

Furthermore, the breadth of evidence supporting the instruction of students with severe disabilities in academic vocabulary, via time delay, is strong and extensive. Multiple studies demonstrate that time delay empowers students with disabilities in their expression and communication of their current levels of understanding (Williamson et al., 2019). Moreover, the intervention is emerging strongly as one of the most promising EBPs by which to prioritize and deliver instruction within the special educational context, in a manner that is more consistent or closely aligned with the academic instruction delivered in the non-disabled context.

Beyond the academic context, there is a strong base of literary evidence showing the effectiveness of task analysis, and systematic prompting and feedback as EBPs that are designed to improve the learning outcomes of students with severe disabilities, in relation to a variety of daily living skills. Several studies consistently demonstrate and replicate the success of task analysis in teaching students with autism to prepare

food and to perform various daily living tasks (Cook et al., 2018). Additional empirical research also proves that the intervention is applicable and feasible among students with different mild to severe intellectual disabilities.

Studies also indicate the need for establishing alternatives to community-based experiences in facilitating students with disabilities' acquisition of daily living skills. In this regard, technological interventions play a pivotal role in enhancing the effectiveness of pertinent EBPs (Spooner et al., 2019). For example, virtual simulations can be embedded into the EBP of generalization to promote the learning outcomes of students with moderate and severe disabilities, in terms of the acquisition and retention of knowledge concerning their daily routines. In their review of literature, Scheeler et al. (2016) establish that simulations can improve the effectiveness of generalization as an EBP. Strong evidence also exists presently, supporting the use of video modeling to teach a variety of target skills among learners with severe disabilities (Williamson et al., 2019). Broadly, technology can not only facilitate the implementation of several EBPs but it can also serve as an effective intervention in itself.

Finally, current research shows that the outcomes of students with disabilities in relation to the acquisition of skills of daily living can be improved significantly and sustainably through the EBP interventions of self-management-skills and social narratives (Hudson et al. 2016; Russo-Campisi, 2017). Hudson and colleagues find that the implementation of a self-management-skills strategy generates the desired results among students with autism and other developmental disabilities (Hudson et al., 2016). The scholars establish concrete evidence indicating that self-management as an intervention assists the sub-population aforementioned in acquiring the skills requisite for monitoring their behaviors, discriminating between acceptable and unacceptable behaviors, and rewarding themselves for achieving desirable behavioral changes. Similarly, Russo-Campisi (2017) notes the existence of moderate evidence supporting the use of social narratives in teaching students with pervasive developmental disorders about critical skills like choice making. His research suggests that social narratives can be effective in teaching participation in novel activities to this sub-population.

How to Support

There is ample evidence in current research proving that the use of collaborative teaming is critical to the provision of support to students with disabilities in multiple areas of their lives (Webster, 2019; Wang & Lam, 2017; Scheeler et al., 2016). The vast majority of studies on the subject of collaborative learning find a high frequency of multifaceted needs among students with severe disabilities (Webster, 2019). The implication of this finding is that this sub-population often requires collaborative teaming as a prerequisite for developing and implementing effective educational supports (Williamson et al., 2019). The intervention requires that professionals work in unison toward the consensual goal of achieving the learners' needs in an open and flexible way that is characterized by shared decision-making. A quintessential collaborative team should draw upon a diversity of members including parents, case-managing special educators, general educators, and other related service providers.

Notably, several studies have investigated the impact of collaborative team operations on the social and academic outcomes of students with severe disability. These studies show improvements in all of the students' reciprocal interactions and academic engagement (Webster, 2019; Williamson et al., 2019). Reichow (2016) finds that regular collaboration among the members of the team reinforces the positive effects aforementioned, and that the benefits are replicable across sub-populations located in linguistically and culturally diverse contexts. Therefore, collaborative teaming shows great promise as an intervention for formulating in-depth plans to support the learning activities of students with disabilities, and as a mechanism for bolstering their educational and social outcomes. However, the quantity of experimental studies conducted to ascertain the intervention's empirical validity is minimal, and this dearth of studies limits the generalizability of current research on the topic.

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