

# EBP *briefs*

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THE EFFECTIVENESS OF ACADEMIC  
ACCOMMODATIONS FOR SCHOOL-AGE STUDENTS  
WITH TRAUMATIC BRAIN INJURY

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# EBP Briefs

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## Structured Abstract

**Clinical Question:** What are the evidence-based classroom accommodations for school-age students with traumatic brain injury who are struggling academically, and do they improve academic performance as compared to no classroom accommodations?

**Method:** Literature Review

**Study Sources:** Google Scholar, ASHA, PubMed, Academic Search Premier

**Search Terms:** Several different combinations of the following terms were used: traumatic brain injury, TBI, accommodations, classroom accommodations, students, and academic accommodations

**Number of Included Studies:** 6

### Primary Results:

Empirical evidence is needed regarding the effectiveness of classroom accommodations for students with TBI.

Students with TBI should be included in decision making about their academic accommodations, and school professionals should implement academic and vocational goals.

Educators and peers should be taught about TBI and the outcomes associated with it, as well as how students with TBI may be affected by their return to school.

As they continue to recover, school professionals should assess students with TBI regularly to ensure the appropriateness of their accommodations as their educational needs change.

**Conclusions:** There is a paucity of research regarding the efficacy of academic accommodations for school-age individuals with TBI. Many review articles and theoretical manuscripts exist; however, the effectiveness of these accommodations has largely only been examined qualitatively. There is a critical need for more evidenced-based practice in this area, particularly in the United States, as the educational system and process of special-education qualification and implementation is markedly different from that of other countries.

# The Effectiveness of Academic Accommodations for School-Age Students With Traumatic Brain Injury

Erin J. Bush and Emily A. Burge

## Clinical Scenario

Kelly has worked as a speech-language pathologist for three years in a rural school district. Her caseload includes kindergarten through high school students. One of Kelly's colleagues, Mrs. Altig, recently asked her to participate in a pre-referral team meeting about a student that is not on her caseload. Blaire, a high school sophomore, was involved in a one-car accident last year, during the spring of her freshman year. Blaire sustained a severe traumatic brain injury (TBI). She was in a coma for one week and subsequently completed inpatient rehabilitation for three weeks, including physical therapy, occupational therapy, and speech-language therapy. She then went to a residential, post-acute facility for approximately two months and completed further rehabilitation and community reintegration activities. She was unable to attend school for the remainder of her freshman year but finished the required academic work throughout the summer with the help of the rehabilitation professionals, a hired tutor, and family members.

Blaire was not referred to Kelly or evaluated for special education upon returning to school. Currently, as a high school sophomore, Blaire is struggling academically. She is in the regular classroom for all of her courses, but after failing the first exams in two classes, Blaire's parents contacted the school with concerns about their daughter. The principal informed them of the school district's prereferral process and suggested they hold a Building Intervention Team meeting. Blaire's parents agreed to this process, preceding having Blaire evaluated for eligibility of services. They stated that they are hesitant to get her into special-education classes because of how it may affect Blaire socially. They claim she has already had some problems fitting back in with her peers since her return. Blaire's parents will attend the meeting along with the special-education teacher, Mrs. Altig, the principal, and some of Blaire's classroom teachers. Mrs. Altig, starting her fourth year of teaching, has never worked with a student with a brain injury. She invited Kelly to attend the Building Intervention Team meeting, as she knows that Kelly did an internship at a medical facility and worked with survivors

of brain injury during her graduate schooling. Specifically, she asked Kelly to present evidence-based recommendations about classroom accommodations at the meeting.

## Background Information

### Traumatic Brain Injury

The Centers for Disease Control (CDC) define traumatic brain injury (TBI) as occurring when an individual sustains:

A bump, blow, or jolt to the head or a penetrating head injury that disrupts the normal function of the brain. Not all blows or jolts to the head result in a TBI. The severity of a TBI may range from *mild* (i.e., a brief change in mental status or consciousness) to *severe* (i.e., an extended period of unconsciousness or memory loss after the injury)." (CDC, 2003).

The severity of the outcome following the injury is dependent upon the severity of the incident, as well as many others factors such as age at the time of injury, health status prior to the injury, concomitant health problems at the time of the injury, access to rehabilitative and medical services, and family and support personnel in the individual's life. Because TBI is so variable, a wide range of symptoms and disabilities can occur. Three major areas of deficit that result from TBI are emotional/behavioral impairments, neurological/physical impairments, and cognitive/intellectual impairments (Mancinelli & Klein, 2014).

For Blaire, the problem appears to be difficulty with academic tasks. Many impairments resulting from a TBI can affect a student's ability to perform academically, such as difficulties with organizational skills, integrating information, and generalizing information to a similar circumstance or situation (Mancinelli & Klein, 2014). This can change an individual's ability to process information as she did before her injury, making academic success difficult and an adjustment to the learning process necessary. This adjustment period may be more successful when school personnel implement appropriate accommodations.

## Accommodations

Academic accommodations serve as useful tools for students with TBI when transitioning from a medical to a school setting. Professionals implement them for many children who have impairments or a disability so that they may display their knowledge without hindrance by their disability. According to the National Center for Learning Disabilities (NCLD; 2006), “Accommodations are alterations in the way tasks are presented that allow children with learning disabilities to complete the same assignments as other students.” It is crucial that accommodations do not alter the assignment’s content or give the students an unfair advantage (NCLD).

Educational professionals may implement academic accommodations when a parent requests them for a student with a formally identified disability or when a school-based team deems them necessary and the student’s parents or legal guardians agree. Children and youth ages 3 through 21 can receive special-education services under part B of the Individuals with Disabilities Education Act (IDEA, 2004). Within IDEA, an Individual Education Plan (IEP) is used to delineate which appropriate accommodations are selected by the IEP team; the team includes the parents and, depending on the child’s age, the child as well. Many different accommodations are available, and those implemented should be contingent on the specific needs of the child (NCLD, 2006). Individuals identified as having a mental or physical impairment can also receive services through Section 504 of the Rehabilitation Act of 1973. This protects the individual from discrimination in educational agencies and holds the schools accountable for ensuring that qualified individuals receive reasonable accommodations (Paul & Cascella, 2007).

## The Clinical Question

Kelly used the PICO (population, intervention, comparison, and outcome) framework, as recommended by the American Speech-Language-Hearing Association (ASHA), to structure her question as follows:

- P** – students with traumatic brain injury that are struggling academically
- I** – classroom accommodations
- C** – compared to no accommodations
- O** – improved academic performance

Kelly’s formal question was:

What are the evidence-based classroom accommodations for school-age students with traumatic brain injury who are struggling academically, and do they improve academic performance as compared to no classroom accommodations?

## Search for the Evidence

Kelly searched three major electronic databases (Google Scholar, Academic Search Premier, and PubMed) and the ASHA website to locate research articles. She used combinations of the following keywords to identify possible studies: traumatic brain injury OR TBI AND accommodations OR classroom accommodations OR academic accommodations AND/OR students. The initial search process resulted in 341 entries. Kelly narrowed her search down quickly, to 180, after eliminating entries with titles and/or abstracts that clearly were unrelated to this field of study (e.g., articles regarding work accommodations or hotel accommodations for guests with brain injuries). She decided to select only peer-reviewed journal articles. Thus, she excluded textbooks, non-peer-reviewed journals, and unpublished literature. Kelly wanted to search specifically for articles pertaining to high school students’ accommodations but knew that she may find more information if her search included a larger age range. She decided to include any research pertaining to school-age children and adolescents but to exclude higher education or early intervention research. Kelly knew that higher education accommodations, governed by the Americans with Disabilities Act of 1990 (ADA) compliance and not by IDEA, followed an entirely different process. Additionally, Kelly felt that if Blaire were a senior, research on higher education may be more pertinent, but Blaire had nearly three more years of high school. Kelly also excluded articles without accommodations or closely related topics (e.g., classroom strategies, environmental modifications). Other types of acquired brain injuries (e.g., brain tumor, birth trauma, hypoxia/anoxia) were generally excluded. Kelly employed other exclusion criteria as follows: perspectives on providing services or implementing accommodations by professionals, studies only pertaining to assessment of students with TBI, legal documents, professional training articles, and those unavailable in English.

Kelly excluded 161 articles after employing the aforementioned exclusion criteria, leaving 19 for further

review. After accounting for duplicates, (largely due to the use of multiple search engines), 17 articles remained. Kelly examined several systematic and literature reviews but selected only one, as it cited evidence-based effectiveness for a specific learning strategy and the others did not (Glang et al., 2008). Thus, Kelly rejected an additional four articles. Kelly omitted seven final articles because they were theoretical in nature and had only recommendations or guidelines but did not evaluate or measure academic accommodations' effectiveness or use.

## Evaluating the Evidence

In addition to the one literature review, Kelly chose to include two articles that were qualitative, as they were more evaluative of classroom accommodations (Mealings & Douglas, 2010; Sharp, Bye, Llewellyn, & Cusick, 2006). These articles also encompassed family members' perspectives, which Kelly thought was important considering Blaire's parents' concerns and because she knew that survivors of brain injury have memory deficits as well challenges with self-awareness and insight. Initially, Kelly was unsure about one these qualitative articles (Sharp et al., 2006) because not all survivor participants had a *traumatic* brain injury. Upon looking more closely at this study, Kelly realized that six of the eight survivors had a TBI, and she chose to include the study given the relevance of all of the study's findings to her clinical question and because it included family members' perspectives. The final three articles Kelly selected had evidence to support her case, but she only used the relevant portion of their quantitative findings (Hawley, Ward, Magnay, & Long, 2002; Hawley, 2003; Taylor et al., 2003).

## Is There a Need for Accommodations?

After Kelly's initial appraisal of the six studies remaining for full review, she thought it best to evaluate the evidence for the need for and use of classroom accommodations (Hawley et al., 2002; Hawley, 2003; Taylor et al., 2003). In the study by Hawley et al. (2002), parents reported that for the combined group of moderate and severe injury survivors, 32% had problems keeping up with schoolwork, 52% had concentration problems, and 39% had memory problems.

Hawley (2003) conducted another study to examine further the problems experienced by children and adolescents after sustaining a TBI by interviewing 48

children and adolescent survivors and their parents. The researcher reported results in groups based on severity of injury (mild and moderate/severe). Kelly decided to focus only on those with moderate and severe injuries since that pertained to Blaire. Among the most enduring problems (those that stayed the same over one year's time or got worse), four domains related to school were reported by participants: schoolwork, behavior problems at school, general problems at school, and school personnel perceived as unsympathetic to the students' needs. Between 67% and 80% of student survivors of moderate/severe injuries reported some or all of these problems.

Taylor et al. (2003) examined three groups of students: two participant groups with brain injuries (42 students with a severe TBI and 42 students with a moderate TBI) and one control participant group (50 students with orthopedic injuries). Kelly noted that there were significant differences between the three groups of students regarding how long they received accommodations. More students with brain injury were receiving accommodations than the control group at every follow-up period, and more students with severe TBI were receiving accommodations than were the students with moderate TBI at every follow-up. While that seemed positive, Kelly noted that at 6 months post-injury the percentage receiving accommodations dropped from 54% to 39% of students with severe injuries, and from 29% to 20% for students with moderate injuries. However, at the 4-year follow-up the percentage of students receiving accommodations had risen again to 62% and 31% for moderate and severe injuries, respectively. Kelly thought that the increase in accommodations over 4 years may have several different explanations. It may suggest that students succeed academically directly after injury because they can rely on past knowledge or because educators and parents showed them lenience because of their injury. This potential lenience would certainly decrease over time. It may suggest that the students struggled with more cognitively demanding materials as they got older or that they were expected to have age-appropriate executive functioning skills (i.e., time management, planning, and organizational skills, the ability to prioritize). Finally, the results could suggest that the students were not given accommodations initially or were under-accommodated. In other words, their academic challenges or potential challenges were initially underestimated.

From her review of this research, Kelly found it alarming that of the 27 students (21 severe, 6 moderate)

with TBI who were receiving services at the 4-year follow-up, only 10 of the students were qualified under the TBI special-education eligibility category. This may indicate a lack of knowledge among educators about the student's brain injury, about the criteria for eligibility, or possibly about the existence of a special education TBI category. Twelve students were qualified under specific learning disabilities, and the remaining students were qualified under developmental handicap, severe behavior handicap, speech or language impairment, or other health impaired (Taylor et al., 2003). This information seemed related to the findings of several other studies (Parkin, Maas, & Rodger, 1996; Sharp et al., 2006; Savage, Pearson, McDonald, Potoczny-Gray, & Marchese, 2001), which suggested that educational professionals need more training regarding TBI and how to assist student survivors of TBI.

### Receiving Academic Support

Next, Kelly evaluated the frequency with which students with TBI received educational interventions, as reported by Taylor et al. (2003). Academic accommodations were among several of the factors tracked over a 4-year period. The researchers did not report specific information about the accommodations provided but reported that the majority of accommodations consisted of individual or small-group assistance for one period a day, strategic seating arrangements, and modifications to assignments or testing processes. Similarly, Sharp et al. (2006) described the following accommodations as those most frequently recommended by either the survivors' parents or the medical/rehabilitation team: a) enrollment changes (part-time status temporarily or permanently); b) changes to course load or course type (dropping certain subjects; not participating in physical education because of mobility or fatigue issues); c) receiving an aide or paraprofessional (for mobility/access issues, reading, and/or notetaking); and d) changes to assignment or testing procedures (extended time, breaks, a reader and/or writer).

In her search for specific, effective accommodations, Kelly chose one literature review (Glang et al., 2008), although the article pertained to instructional practices for teachers rather than classroom accommodations and did not evaluate accommodation effectiveness. Kelly decided that the article partially fit her evidenced-based criteria because the instructional practices had been validated and one recommendation from the article could be

converted into an accommodation. The authors reviewed instructional practices for students in other disability categories but provided evidence regarding the likelihood of their applicability to students with TBI. Because graphic organizers have been shown to be effective for other student populations, Glang and colleagues recommended them to address executive functioning deficits, with which survivors of TBI commonly contend. Graphic organizers typically consist of a combination of circles or boxes with lines to visualize a connection between concepts or ideas. Kelly felt they could be useful in many of Blaire's classes because they are flexible in structure and content. She also felt that once Blaire had practice using them, she might implement them independently.

### Students' Outlook on Accommodations

Kelly found important information regarding accommodations and their implementation when she appraised the two qualitative studies (Mealings & Douglas, 2010; Sharp et al., 2006) reported that student participants felt both positively and negatively about their academic accommodations. Positive reports regarding accommodations included seeing the utility in them, wanting to be a part of the decision-making process (Mealings & Douglas, 2010), and desiring an increase in independence over time (Sharp et al., 2006). Negative comments centered on teachers not reliably implementing academic accommodations and instances of a poorly organized school return (Sharp et al., 2006). Students from both participant groups discussed their dislike of feeling singled out from their peer groups.

Mealings and Douglas (2010) reported that when the students looked retrospectively on the changes in the academic supports, they were likely to see the utility in them, despite feeling negatively about them at the time of implementation. The study also revealed that the students desired to be part of the decision-making process about their supports. They wanted to help develop the plan for accommodations and for those on the team to understand their individual needs (Mealings & Douglas, 2010). The students stated that they needed academic goals to motivate them to attend school and complete assignments. Further, academic goals were particularly beneficial if they were associated with the students' vocational aims (Mealings & Douglas, 2010). Both students and their parents frequently recommended the continual evaluation of accommodations

and supports, as the students' deficits and needs continually evolved (Mealings & Douglas, 2010; Sharp et al., 2006). Specifically, students that received an aide felt it was important for that support to fade over time and to increase the students' autonomy (Sharp et al., 2006).

When the students spoke about interactions at school, regardless of whether they were meeting academic standards, their attitudes related directly to their personnel interactions. If the students had good interpersonal relationships with school personnel, they did not comment negatively about school in general. Contrarily, if the students experienced negative interactions, they cited the school professionals as targeting them or treating them differently than their peers. The students expressed the same feelings regarding peer interactions as well (Mealings & Douglas, 2010). Students from both studies explained feelings of discomfort with the change in their academic supports because they felt different from their peers and their needs had been different prior to injury. Potentially further contributing to students' negative comments about accommodations, Sharp et al. (2006) found that academic accommodations were not implemented reliably by all teachers, despite the fact that they were guaranteed to students upon their school return. Finally, students and parents wanted a more organized school return that involved: a) collaboration between the student, his/her parents, school professionals, and medical professionals; b) educating the school professionals and the student's peers about brain injury; and c) preparing the student (Sharp et al., 2006). Ideally, all of these components would take place prior to the student returning to school.

## An Organized School Return

Sharp et al. (2006) determined that organizing the school return was crucial to the student's academic success and needed to involve educating the teachers and peers, organizing academic accommodations, preparing the student, and making decisions about parent involvement. Sharp et al. (2006) also discussed what happened when there was an unorganized school return and found that it often contributed to academic struggles and negative feelings about school from both the student and his/her parents. Kelly began to suspect that unorganized returns occur more often than organized returns based on another article she reviewed. Hawley et al. (2002), after surveying the parents of students with brain injury, found that schools made special arrangements for the return of the injured student

in only 20% of the cases, although there were significant differences depending on the severity of the injury. Severely injured children ( $N = 49$ ) had special arrangements made prior to their return in 55% of the cases, while only 35% of the students in the moderately injured group received planned arrangements ( $N = 57$ ).

## The Evidence-Based Decision

In general, Kelly felt that the evidence was clear regarding the need for accommodations for students with TBI that struggle academically. However, the evidence was unclear regarding which accommodations are effective for students with TBI. This was largely due to the overall lack of quantitative data regarding accommodation effectiveness. Kelly also felt that it was evident that many students do not receive appropriate accommodations, likely due to a lack of education among school professionals regarding the needs of TBI survivors and ways to implement supports.

Kelly felt that there were several helpful findings in the qualitative studies reviewed but questioned the validity of the evidence given the small numbers of participants. Ultimately, she decided to address her question with the evidence available to her and, given the idiosyncratic nature of the problems experienced by survivors, felt that the qualitative articles were pertinent to the upcoming pre-referral meeting to address Blaire's academic needs.

After reviewing the findings of Sharp et al. (2006), Kelly recognized that Blaire had returned to school without the proper supports in place. The researchers had given two choices of how to respond to this problem. First, the student, parents, and school professionals could revisit the organization of the return-to-school process and try again. The second option was for the student to seek alternative placement or pursue another avenue other than public schooling. Kelly did not find the latter option appealing and felt that she may be able to influence the Building Intervention Team to reorganize Blaire's academic plan.

Specifically, Kelly planned to ask the principal and Mrs. Altig if she could invite Blaire to the meeting. She now realized it was important that Blaire felt part of the process regarding her educational supports. Kelly planned to suggest the following accommodations cited in two of her articles but knew that Blaire's academic accommodations, as well as the implementation of them, should be tailored to her specific needs, as opposed to just recommending typical accommodations. Kelly knew that Blaire's academic



accommodations, as well as the implementation of them, should be tailored to Blaire's specific needs. Kelly planned to suggest the following accommodations cited in two of the articles (Sharp et al., 2006; Taylor et al., 2003) she reviewed:

- Enrollment changes (either to school in general or to specific classes)
- Receiving a paraprofessional for reading and/or notetaking
- Changes to assignment or testing procedures (extended time, breaks, a reader and/or a writer)
- Changes to seating (in all classes or specific classes)

Kelly planned to recommend the use of graphic organizers and planned to bring a sample for the team members to view. She intended to point out that any accommodation implemented needed to be continually evaluated to ensure that it was still needed and was not inhibiting Blaire's autonomy. Finally, Kelly planned to ask the principal, Blaire, and Blaire's parents if she could give an in-service presentation about brain injury to the staff and students at her school. She felt equipped to do this using several articles she had found in her search. Kelly looked forward to revisiting Blaire's educational needs, emphasizing the need for academic and vocational goals for Blaire, and encouraging positive interactions between Blaire and school personnel as well as Blaire's peers.

## Authors' Note

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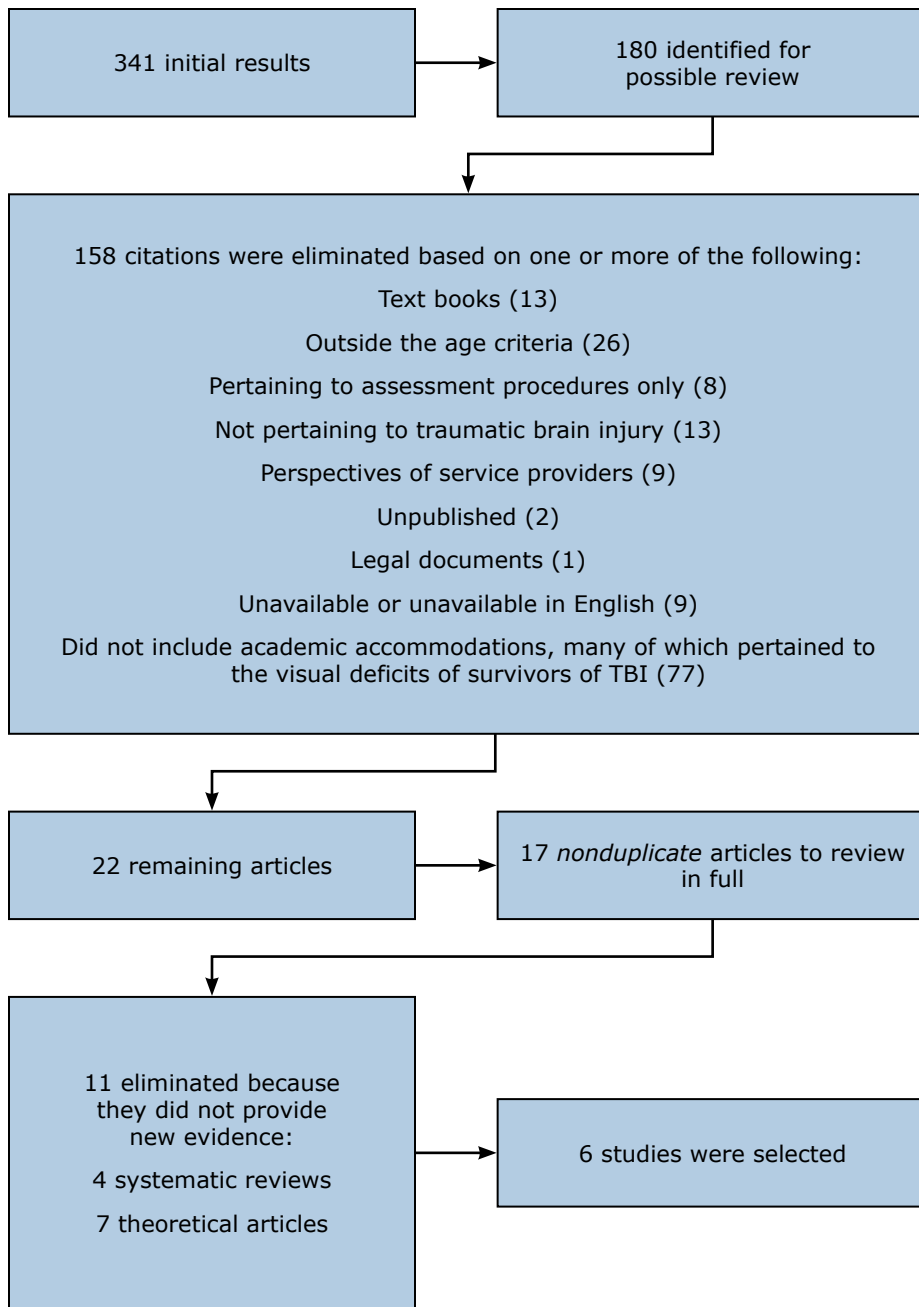
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**Table 1. Articles Selected for Review**

Reference Location	Participants	Design Type & Features	Major Findings
Mealings & Douglas (2010) Australia	3 male survivors of severe TBI in public secondary education; approximately 1–3 years post-injury	<ul style="list-style-type: none"> <li>• Qualitative</li> <li>• Grounded theory</li> </ul>	<ul style="list-style-type: none"> <li>• Regarding school, students with TBI desire academic goals, positive personal interactions, feeling a part of the decision-making process, and continual evaluation of accommodations</li> </ul>
Glang et al. (2008) United States	N/A	<ul style="list-style-type: none"> <li>• Literature review of instructional strategies</li> </ul>	<ul style="list-style-type: none"> <li>• Graphic organizers are likely useful for students with TBI, as they have evidence-based effectiveness with other students who have special needs.</li> </ul>
Taylor et al. (2003) United States	134 children (42 with severe TBI, 42 with moderate TBI, and 50 control subjects with orthopedic injuries only)	<ul style="list-style-type: none"> <li>• Quantitative</li> <li>• Longitudinal (4 years)</li> </ul>	<ul style="list-style-type: none"> <li>• Of students with moderate/severe TBI, more were receiving accommodations at 6 months post-injury than at 1 year. By 4 years post-injury, the number had surpassed the 6-month post-injury total</li> <li>• Most students with TBI that were receiving services were not qualified under the TBI eligibility category</li> </ul>
Sharp, Bye, Llewellyn, & Cusick (2006) Australia	8 adolescent survivors of a recent, severe TBI and their families	<ul style="list-style-type: none"> <li>• Qualitative</li> <li>• Grounded theory</li> <li>• Longitudinal (2 years)</li> </ul>	<ul style="list-style-type: none"> <li>• Participants felt accommodations and support should continually be evaluated, due to changes in the survivor and their educational needs and demands</li> <li>• Accommodations were not reliably implemented by school personnel</li> <li>• An <i>organized school return</i> was key to a survivor's successful return to school</li> </ul>
Hawley, Ward, Magnay, & Long (2002) United Kingdom	Parents/guardians of 525 children who sustained a brain injury (419 mild, 57 moderate, 49 severe), 1–6 years post-injury	<ul style="list-style-type: none"> <li>• Quantitative</li> <li>• Postal questionnaire</li> </ul>	<ul style="list-style-type: none"> <li>• Students with TBI and their caregivers report problems at school or problems that negatively impact academic achievement</li> <li>• Schools made special arrangements for a student's return following a TBI only 20% of the time, although it was more likely to occur if the injury was severe or moderate, rather than if it was mild</li> </ul>
Hawley (2003) United Kingdom	2-year follow-up of participants from Hawley et al. (2002): 97 children with brain injury (49 mild, 19 moderate, 29 severe), ages 5–15 years and their family members	<ul style="list-style-type: none"> <li>• Quantitative</li> <li>• Interviews conducted, structured checklists, and validated scales used</li> </ul>	<ul style="list-style-type: none"> <li>• Students with moderate/severe TBI report problems at school as some of the most enduring</li> </ul>



*Figure 1. Study Search and Selection Process*