Meeting the Needs of Students with Traumatic Brain Injury

Heather K. Koole

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MEETING THE NEEDS OF STUDENTS WITH TRAUMATIC BRAIN INJURY

by

Heather Koole

A dissertation submitted to the Graduate College in partial fulfillment of the requirements for the degree of Doctor of Philosophy Interdisciplinary Health Sciences Western Michigan University December 2014

Doctoral Committee:

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School reintegration following pediatric traumatic brain injury (TBI) presents a number of challenges. This dissertation comprises three studies exploring common themes of best practice, training, and supporting success for students with TBI in school settings.

Study 1 reports the results of a survey of 70 speech-language pathologists (SLPs) who responded to questions about their use of clinical activities that described more or less contextualized services. Current literature supports contextualized service delivery as best practice. Findings indicated that 98% of participants reported using at least one contextualized practice. Higher use of contextualized practices was associated with working in schools (compared to health care settings), access to experts, and having greater experience with TBI. Most frequently cited reasons for not using practices exemplifying contextualized service delivery included not fitting the student and scheduling issues.

Study 2 was a partially randomized controlled investigation designed to evaluate effectiveness of interprofessional TBI training to prepare 26 SLP and 11 special education (SPED) students to work collaboratively. The SLP students were assigned semi-randomly to a control group (n = 16), who received instruction in the traditional
class format of TBI lecture with group discussions, and an experimental group \((n = 10)\), who participated in an interprofessional training with the SPED students. Training incorporated lectures on TBI and collaboration, small group activities, and interprofessional role-plays. TBI knowledge for all three groups increased significantly over time, with the experimental and control groups making similar improvements. SLP students showed more TBI knowledge than their SPED counterparts at pre- and post-testing.

Study 3 used qualitative methods to explore perspectives about reintegration success through semi-structured interviews with children and adolescents with TBI, their parents, and clinical and educational professionals. Four themes emerged from the data associated with defining and supporting students’ success: communication and connection; knowledge and awareness; services, support, and strategies; and student attributes and circumstances.

Collectively, these studies offer new information about the complex process of returning to school following TBI. Insights gained include evidence that education and knowledge have the power to equip professionals and families to collaboratively support students with TBI as they attempt to achieve success.
ACKNOWLEDGMENTS

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Heather Koole
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACKNOWLEDGMENTS</td>
<td>ii</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>viii</td>
</tr>
<tr>
<td>CHAPTER</td>
<td></td>
</tr>
<tr>
<td>I. INTRODUCTION TO THE THREE STUDIES</td>
<td>1</td>
</tr>
<tr>
<td>References</td>
<td>4</td>
</tr>
<tr>
<td>II. FACTORS INFLUENCING THE USE OF CONTEXTUALIZED PRACTICES WITH STUDENTS WHO HAVE TRAUMATIC BRAIN INJURIES</td>
<td>8</td>
</tr>
<tr>
<td>Background</td>
<td>8</td>
</tr>
<tr>
<td>Method</td>
<td>14</td>
</tr>
<tr>
<td>Participants</td>
<td>14</td>
</tr>
<tr>
<td>Procedures and Instrumentation</td>
<td>15</td>
</tr>
<tr>
<td>Analysis Methods</td>
<td>18</td>
</tr>
<tr>
<td>Results</td>
<td>19</td>
</tr>
<tr>
<td>Description of the Sample</td>
<td>19</td>
</tr>
<tr>
<td>Description of Speech-Language Pathologist Practices</td>
<td>21</td>
</tr>
<tr>
<td>Relationships Between Experience and Practices</td>
<td>23</td>
</tr>
<tr>
<td>Reasons for Not Using Contextualized and Traditional Practices</td>
<td>26</td>
</tr>
<tr>
<td>Discussion</td>
<td>29</td>
</tr>
<tr>
<td>Strengths and Limitations</td>
<td>31</td>
</tr>
<tr>
<td>Conclusions</td>
<td>32</td>
</tr>
<tr>
<td>References</td>
<td>33</td>
</tr>
</tbody>
</table>
# Table of Contents—Continued

## CHAPTER

### III. PREPARING PROFESSIONALS TO WORK WITH STUDENTS WITH TRAUMATIC BRAIN INJURY IN EDUCATIONAL SETTINGS .......... 37

- **Background** ......................................................... 37
- **Method** ................................................................. 42
- **Participants** ........................................................... 42
- **Design** ................................................................. 43
- **Procedure for the Experimental Group** ............................. 44
- **Procedure for the Control Group** .................................. 48
- **Measures** ............................................................... 50
- **Analysis Plan** ......................................................... 55
- **Results** ................................................................. 56
- **TBI Knowledge** ....................................................... 57
- **Collaboration Knowledge** ............................................. 61
- **Discussion** ............................................................ 62
- **Strengths and Limitations** ........................................... 67
- **Conclusions** ......................................................... 68
- **References** ............................................................ 70

### IV. MULTI-PARTICIPANT PERSPECTIVES OF SUCCESSFUL SCHOOL REINTEGRATION FOR STUDENTS WITH TRAUMATIC BRAIN INJURY ......................................................... 75

- **Background** ........................................................... 75
- **Use of Interview Methods** ............................................ 78
- **Need for Additional Perspectives on “Success”** ..................... 80
Table of Contents—Continued

CHAPTER

Methods ............................................................................................................. 83
Design .................................................................................................................. 83
Participants .......................................................................................................... 84
Analysis ............................................................................................................... 85
Results .................................................................................................................. 87
Participants .......................................................................................................... 87
Themes and Subthemes ....................................................................................... 91
Discussion .......................................................................................................... 112
Strengths and Limitations .................................................................................. 118
Conclusion .......................................................................................................... 119
References ........................................................................................................... 120

V. IMPLICATIONS OF STUDIES ON SCHOOL REINTEGRATION
FOLLOWING TRAUMATIC BRAIN INJURY ......................................................... 126
Implications for Practice ..................................................................................... 127
Implications for Future Research ........................................................................ 129
Limitations Across the Three Studies ................................................................. 130
Conclusions ......................................................................................................... 130
References .......................................................................................................... 131

APPENDICES

A. Human Subjects Institutional Review Board Letters of Approval ................. 134
B. Role Play Information Sheets .......................................................................... 138
C. Case Studies for Instruction with SLP Control Group .................................... 142
Table of Contents—Continued

APPENDICES

D. ABI Parenting/Teaching Proficiencies Scale .................................................. 145
E. Case Study for Pre- and Posttesting with Experimental Group ..................... 147
F. TBI Knowledge Score Rubric ........................................................................ 149
G. Semi-Structured Interview Questions ......................................................... 152
LIST OF TABLES

2.1 Characteristics of Traditional and Contextualized Practices .......................... 18
2.2 Pediatric Caseloads: Total Clients and Clients with TBI (Current Caseload) .......... 20
2.3 Proportion of 70 Participants (from High to Low) Reporting Educational Experiences Regarding TBI ........................................................................................................ 21
2.4 Reported Intervention and Service Delivery Practices ...................................... 22
2.5 Hierarchical Multiple Regression Results for Predictive Value of Experience-Based and Caseload Variables ......................................................................................... 25
2.6 Point-Biserial Correlation and Chi-Square Results for Contextualized Practices and Key Experience Variables ........................................................................................................ 27
2.7 Frequencies and Proportions of Reasons for Not Using Contextualized and Traditional Practices ........................................................................................................ 28
3.1 Training Time Frames, Topics, and Instructional Methods for Experimental Group and Control Group ................................................................. 45
3.2 Interprofessional Training Role Play Types and Larger Groups ....................... 48
3.3 Variables of Interest and Corresponding Descriptions, Measurement Tools, and Score Ranges ........................................................................................................ 51
3.4 Examiner-Rated Collaboration Knowledge\(^a\) Assessment Questions, Rubric, and Sample Answers ........................................................................................................ 53
3.5 Medians, Means, and Standard Deviations for all Pre- and Posttest Measures by Group ........................................................................................................... 57
4.1 Student Participant Characteristics at Time of Injury and at Time of Interview ................................................................................................................................. 88
4.2 Themes, Subthemes, and Examples of Issues from the Interviews ..................... 92
CHAPTER I
INTRODUCTION TO THE THREE STUDIES

According to the Centers for Disease Control and Prevention (CDC, 2012), approximately 475,000 children survive traumatic brain injuries (TBI) each year in the United States. Various other sources present a wide range of prevalence data suggesting that as many as 30% of people under 25 have sustained a TBI (McKinlay et al., 2008) or more conservatively estimating that 3.8% of the population has sustained a TBI by age 35 (Corrigan, Selassie, & Orman, 2010). Regardless of the prevalence data one chooses to review, the numbers are high. These high numbers result in many children and adolescents living with the significant, long-term sequelae associated with pediatric TBI (Glang, Tyler, Pearson, Todis, & Morvant, 2004).

Research about the problems that children and adolescents face following TBI is plentiful. Along with possible physical injuries that often heal, common areas of persisting deficit encompass cognitive, linguistic, socio-emotional, and behavioral components (Cronin, 2001; Galvin, Froude, & McAleer, 2010; Yeates & Taylor, 2006; Ylvisaker et al., 2005). The fact that children are not “little adults” (Yen & Wong, 2007, p. 63) has been stressed by researchers who make apparent that younger brains are worse off than adult brains after TBI (Anderson et al., 1997; Ylvisaker et al., 2005) The brains of young children are more vulnerable to secondary trauma (Cronin, 2001) and may not be able to acquire developmental skills that would typically be expected as they age (Cook, DePompei, & Chapman, 2011; Galvin et al., 2010). The significant sequelae of
pediatric TBI and the persisting nature of these deficits lead to considerable issues in home, community, and school reintegration (VanTol, Gorter, DeMatteo, & Meester-Delver, 2011; Yeates & Taylor, 2006).

Studies that have examined the lived experiences of children with TBI and their families, and have explored perceptions of the recovery process, make it clear that life after TBI is rife with struggles for both the children and their parents (Adams & Adams, 2008; Rodset, 2008; Roscigno & Swanson, 2011; Sharp, Bye, Llewellyn, & Cusick, 2006; Wade et al., 2001). Difficulties with completing schoolwork, keeping friends, advocating for services, and finding a community of support all are mentioned in these studies as consequences of pediatric TBI. Some authors also have begun to ask questions about whether the most important aspects of life after TBI are being measured and whether the manner in which those aspects are being measured is most appropriate (Badge, Hanock, & Waugh, 2009; Bedell & Coster, 2008; Di Battista, Soo, Catroppa, & Anderson, 2012). In reading the literature on outcomes of pediatric TBI, it becomes evident that future research must include an examination of multiple perspectives in defining indicators of success for children returning to their lives after hospital discharge and in the many years following.

Suggestions stemming from studies for supporting families and children along this journey include educating school personnel and setting up appropriate accommodations (Sharp et al., 2006), developing personal coping strategies (Rodset, 2008), and providing information to families about what to expect (Renstrom, Soderman, Domellof, & Emanuelson, 2012). In addition, the literature provides best practice recommendations for reintegrating students with TBI into school. Research indicates that
these students require ongoing support for academic and social success and that intervention should be contextualized and collaborative (DePompei, Epps, Savage, Blosser, & Catelli, 1998; Taylor et al., 2003). Contextual practices can be defined as those that incorporate real-life, meaningful activities that integrate multiple skills and rely on collaborative efforts among the players in a child’s life (Deidrick & Farmer, 2005; Feeney & Ylvisaker, 2008; Glang et al., 2004; Marcantuono & Prigatano, 2008; Savage, DePompei, Tyler, & Lash, 2005).

On one hand, research supports the fact that students with TBI require long-term and unique support, but the literature also addresses the fact that there are many children and adolescents with TBI who do not receive this support. The American Speech-Language-Hearing Association (ASHA, 2012) reported that 17.4% of SLPs who participated in ASHA’s school-based survey regularly worked with students with TBI. This is in contrast to 90.3% of respondents to the same survey who indicated that they regularly worked with students with autism even though the prevalence rate for autism is lower than that for TBI (CDC, 2012). Glang and colleagues (2008) and Gfroerer, Wade, and Wu (2008) have looked at the concern that services to students with TBI are not being adequately provided. They reported data that indicated many students with TBI who had perceived needs for educational services did not receive formal school-based intervention.

The under-identification of students with TBI for formal school-based services may be related to the limitations in knowledge and experience of professionals working in educational settings. Research has provided evidence about the lack of confidence, training, and experience of speech-language pathologists (SLPs) and educators (Farmer
& Johnson-Gerard, 1997; Glang, Todis, Sublette, Brown, & Vaccaro, 2010; Hux, Walker, & Sanger, 1996; Mohr & Bullock, 2005) in addressing the needs of students with TBI. Although the literature provides information about the attitudes, beliefs, and knowledge of SLPs and educators for working with this population, there is limited empirical data about the actual practices of SLPs and about activities or education that might increase their knowledge, skills, and confidence in providing the supports needed by these students.

In summary, the literature is rich with information about pediatric TBI, but questions remain. The three studies of this dissertation sought to provide insight into the practices of SLPs who work with students with TBI, training methods for preparing SLPs and educators to provide best practice, and definitions of and support for success following pediatric TBI.

References


CHAPTER II

FACTORS INFLUENCING THE USE OF CONTEXTUALIZED PRACTICES WITH STUDENTS WHO HAVE TRAUMATIC BRAIN INJURIES

Background

Traumatic brain injury (TBI) affects 1.7 million people in the United States per year (Centers for Disease Control and Prevention [CDC], 2013). Fifty-two thousand of these individuals die, but many more survive and live with the physical, mental, and emotional consequences that ensue (CDC, 2013). Approximately 475,000 of individuals who live with functional limitations from TBI are children under 14 years of age (CDC, 2013). Consequently, educational professionals and support personnel are faced with the responsibility of providing services for a large number of children and adolescents struggling with the neurological sequelae of TBI, which can range from subtle (but significant) deficits to disabilities that require full-time special education placement. Specific cognitive-communication skills that are often affected in children with TBI include attention, memory, executive functioning, social communication, and emotional and behavioral control (Jantz & Coulter, 2007; Ylvisaker et al., 2005). In addition, children with TBI often demonstrate increased deficits over time in light of increased cognitive demands and decreased ability to develop age-expected skills (Anderson, Catroppa, Morse, Haritou, & Rosenfeld, 2005; Gamino, Chapman, & Cook, 2009).

As these data show, many students in the U.S. currently are dealing with academic and social struggles that ensue from the cognitive and behavioral sequelae associated with TBI. The caseloads of school-based speech-language pathologists (SLPs),
however, do not proportionally reflect the numbers of students with TBI (Schutz, Kenyatta, McNamara, Schutz, & Lobato, 2010). Only 17.4% of SLPs reporting that they regularly work with students with TBI (American Speech-Language-Hearing Association [ASHA], 2012), even though SLPs are uniquely trained to support cognitive communication. The scope of this problem can be grasped more readily when these figures are contrasted with the 90.3% of SLPs who report regularly working with students with autism, even though the reported estimates for prevalence of autism in the pediatric population is only 1.1% (CDC, 2012). The number of children aged 10 to 14 who survive TBI each year is approximately 475,000 (CDC, 2013), with prevalence estimates in school age children as high as 10% (Schutz et al., 2010). To further highlight the underrepresentation of students with TBI on the caseloads of school-based SLPs, one can look to the U.S. Department of Education’s report (2012), which stated that 378,000 students received federally funded special education services under the category of autism while only 25,000 received services under the category TBI.

Consistent with these figures, Glang, Tyler, Pearson, Todis, and Morvant (2004) suggested that educational professionals, advocates, and families are concerned that services to support students with TBI are not being adequately provided. Glang and other colleagues (2008), in their study of 56 students with TBI, found that only 25% were identified for formal school-based services (i.e., having an Individualized Education Plan or 504 Plan). Further, they found that approximately one third of the students received neither formal nor informal services, including 18.5% of the students with severe TBI. Groerer, Wade, and Wu (2008) reported similar findings, in that few students with
perceived needs academic support received formal interventions beyond basic accommodations.

One factor that may play a role in the under-identification of students with TBI for formal support services in the schools is a lack of knowledge, experience, and confidence that professional educators may have about how to work with this population. In conducting focus groups with 21 adults with TBI and their family members, Leith, Phillips, and Sample (2004) reported similar results to Glang and colleagues (2004, 2008) and Gfroerer and colleagues (2008) in that family members consistently perceived a lack of knowledge about TBI on the part of many of the people they interacted with during their family member’s rehabilitation.

In their survey of 184 educators (including SLPs), Farmer and Johnson-Gerard (1997) found that respondents held misconceptions about the effect of TBI on cognition, behavior, and continued development, all of which are reported in the literature to be key elements in understanding how to support students with TBI. Evans, Hux, Chleboun, Goeken, and Deuel-Schram (2009) reported that although SLP graduate students demonstrated more accurate knowledge about TBI than the general public, upon graduation with their master’s degrees, they still held misconceptions that could potentially impact their service delivery with children with TBI. In other surveys of school-based SLPs, Hux, Walker, and Sanger (1996) and McGrane and Cascella (2000) found that only half of the respondents had received specific training in TBI. McGrane and Cascella’s results indicated further that those with training were more likely to include students with TBI on their caseloads. Hawley’s (2005) case study of an adolescent five years post-TBI, painted a picture of potential consequences of these
misconceptions and lack of training. Hawley described a situation in which the adolescent struggled significantly in school, did not receive special education services for the cognitive communication deficits associated with his TBI, and was perceived as “disruptive.” Hawley attributed this to teachers not linking this student’s academic and behavior struggles with his TBI.

Mohr and Bullock (2005) reported findings from focus groups with professional educators (special education teachers, diagnosticians, and behavior specialists). Their results supported the earlier evidence of Hux et al. (1996) and McGrane and Cascella (2000) that only approximately half of the educators had received training related specifically to TBI. They also found that those professionals familiar with TBI were able to offer specific suggestions for student goals, whereas those unfamiliar with TBI were unable to do so. These studies, as well as those mentioned in earlier paragraphs, provided information about basic knowledge and general experience of professionals working with students with TBI. What they did not do is provide adequate insight into the types of intervention and service delivery practices SLPs choose to use with their students with TBI.

Basic knowledge about TBI can provide the background for working effectively with students with TBI, but ultimately, clinicians need to know what to do in treatment that will address these students’ unique needs. One characteristic of service provision for children and adolescents with TBI that is associated with best practice is described as contextualization of practices. This description is based on both expert opinion (ASHA, 2003; Deidrick & Farmer, 2005; Savage, DePompei, Tyler, & Lash, 2005; Ylvisaker & Feeney, 1994) and empirical research (Braga, Da Paz, & Ylvisaker, 2005; Feeney &
Ylvisaker, 2003, 2008; Glang, Todis, Cooley, Wells, & Voss, 1997; Ylvisaker & Feeney, 2009). Using the literature as a guide, contextualized practices can be defined as those that incorporate functional, personally-relevant activities that integrate multiple skills and rely on collaborative efforts among the professionals and family members who play an active role in a child’s life.

An American Speech-Language-Hearing Association technical report (2003) outlined two distinct approaches to working with individuals with TBI, characterized by the terms “traditional paradigm” and “contextualized paradigm.” The authors of the report explained the traditional paradigm as having a focus on repairing the discrete cognitive skills underlying the neuropsychological deficits through hierarchies of structured clinical tasks. In contrast, they explained the contextual paradigm as facilitating participation in real world activities through a collaborative focus on practicing functional tasks with personally relevant content. After reviewing the distinctions between the two paradigms, the authors provided rationale for considering the contextualized paradigm as a viable alternative to the traditional paradigm.

This description of the contextualized paradigm by the American Speech-Language-Hearing Association (2003) is consistent with many aspects of the practices focused on by other leaders in the field. The contextualized paradigm can be seen in the work of Braga et al. (2005), who found that children who participated in family-supported intervention delivered in the context of their everyday routines made more clinically relevant improvements than the children who participated in conventional, clinically driven (decontextualized) treatment. DePompei et al. (2008) also reported success with compensatory intervention implemented in functional contexts; supported
by collaboration between clinicians, teachers, and parents; and driven by the children’s and adolescents’ interests and daily activities.

Along with the research focused on contextualized services are expert recommendations. For example, Ciccia, Meulenbroek, and Turkstra (2009) and Savage, DePompei, Tyler, and Lash (2005) presented a series of best practice suggestions based on the contextualized paradigm that included assessing skills in functional settings, participating in ongoing monitoring following discharge, communicating with family and other professionals in the children’s and adolescents’ lives.

Although results of several studies indicate that SLPs may lack training, experience, and knowledge (Evans et al., 2009; Hux et al., 1996; McGrane & Cascella, 2000; Mohr & Bullock, 2005), the details about SLPs’ service delivery practices with students who have TBI are not clear. Prior studies have provided insight into the knowledge SLPs have regarding basic service provision, but they have not explored how that knowledge translates into routine clinical practice and how well it corresponds with the emphasis in recent literature on contextualized practices. To fill this gap, the current study used a survey method to obtain information from Michigan SLPs about their intervention approaches, service delivery methods, and rationale for their choices. The research questions that guided the investigation were as follows:

1. With what frequencies do SLPs report participating in intervention approaches and service delivery modes that can be characterized as fitting criteria for a contextualized paradigm?
2. Are there experience-based and caseload factors that are associated with the contextualized intervention approaches and service delivery modes chosen by SLPs?

3. What reasons do SLPs identify for not using specific contextualized intervention approaches and service delivery modes?

**Method**

**Participants**

The target population for this study comprised SLPs who—within the past five years—have practiced with children or adolescents who have TBI. Participants were not required to be working in schools; rather the goal was to recruit SLPs who had recent experience working with school-age students post TBI in any setting. The SLPs for this study were recruited using an email list for all SLPs on the Michigan Speech-Language-Hearing Association member list. Additional emails were sent to an SLP Michigan conference registration list to invite them to participate in a survey “Practices of Speech-Language Pathologists with Students with Traumatic Brain Injury.” Limiting the sample to the state of Michigan has implications for the generalizability of findings, but it also introduced a control for differences across states in their insurance laws. Michigan’s no-fault insurance laws allow SLPs employed within rehabilitation networks to sustain therapeutic relationships with clients with TBI much longer than in many other states. Therefore, Michigan SLPs provide a unique window into intervention and service delivery with the pediatric TBI population transitioning from rehabilitation settings to schools.
Following Human Subjects Institutional Review Board (HSIRB) approval from Western Michigan University (Appendix A), survey invitations were sent to 933 email addresses. To elicit responses from clinicians who had experience working with students with TBI (and conversely, to filter out responses from those without TBI experience), the invitation indicated that the survey asked about SLP practices with students with TBI. The first question on the survey asked whether respondents had worked with children or adolescents in the past five years. Respondents who responded “no” were redirected to an exit page. Thus, the sample consisted of SLPs who had worked with children and adolescents in the past five years and had reported working with at least one student with TBI at some point in their careers. Because the survey was set up so that respondents could answer questions about “their most recent students with TBI,” it did not filter out participants who did not have students with TBI on their current caseloads.

**Procedures and Instrumentation**

The research data were collected using an online survey administered via SurveyMonkey™. The survey was constructed after examining the literature for existing surveys related to SLPs’ clinical work with children and adolescents post TBI. Most of these prior survey questions asked about SLPs’ knowledge and beliefs, not about their specific practices (Evans et al., 2009; Farmer & Johnson-Gerard, 1997; Hux et al., 1996; McGrane & Cascella, 2000). Consistent with research and opinions of leaders in the field (e.g., DePompei et al., 2008; Feeney & Ylvisaker, 2003, 2008; Ylvisaker et al., 2001), the survey that resulted represented two distinct approaches, “traditional paradigm” and the “contextualized paradigm,” to cognitive rehabilitation with individuals with TBI, as outlined in the American-Speech-Language-Hearing Association technical report (2003).
To address the three research questions, the survey included questions about experience and caseload, actual practices used, and perceived reasons for using or not using specific practices. The experience and work-related variables that were examined in relationship to SLP practices were caseload size, number of years since graduation from a master’s program, TBI experience (total number of clients with TBI ever worked with across settings), work setting (dichotomized as school or other), and access to experts (dichotomized as having access to a TBI transition team and/or someone to consult for information or not).

The survey also included five multi-part items about choices for using certain practices and, if they did not use them, whether barriers might account for not choosing those practices. In addition, one open-ended item gave respondents the opportunity to contribute comments about their experiences or practices with children and/or adolescents with TBI. Five areas of practice were investigated with the survey: assessment, setting goals, goal content, intervention approaches, and service delivery. For each area of practice, a set of specific practices was presented. The participants selected yes if they used a particular practice and they were permitted to say “yes” to as many options as fit their practices. If participants did not use a particular practice, they could choose as many reasons for not using that practice as were applicable. The options for reasons that a particular practice was not used included: not best practice, didn’t fit the student, time/scheduling issues, not enough support or resources, and not enough confidence or knowledge. Space was not provided for respondents to list their practices that were not included on the predetermined list.
A panel of nationally recognized experts in TBI whose work is represented in the peer-reviewed literature assisted in developing content validity of the survey instrument. The panel members were asked to rank order a series of practice items in an attempt to identify what elements define best practice. In addition, three panel members offered advice about specific subject matter to include on the survey. There was general consensus among panel members that best practice involved using multiple contextualized practice options simultaneously and depended greatly on each individual situation.

Table 2.1 provides criteria that were used to classify practices on the survey as either traditional (clinical, generic, hierarchical, expert-driven) or contextualized (functional, personally relevant, non-hierarchical, collaborative). These criteria were based on recommendations in the literature about working with students with TBI (Braga et al., 2005; Feeney & Ylvisaker, 2008; Wade, Michaud, & Maines-Brown, 2006), the ASHA technical report (Ylvisaker et al., 2001), and the input of the expert panel about what specific practices were most important to include when working with students with TBI. Six of the practices included on the survey were predefined based on these criteria as traditional and 12 as contextualized. The survey participants could not see which practices the authors had defined as traditional or contextualized.

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1 Members of the panel are listed in the acknowledgments.
### Table 2.1

*Characteristics of Traditional and Contextualized Practices*

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<th>Traditional</th>
<th>Contextualized</th>
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<td>Clinical (structured exercises with little personal relevance or connection</td>
<td>Functional (real-life tasks with content and goals that are personally relevant)</td>
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<td>to real-life activities)</td>
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<tr>
<td></td>
<td>Hierarchical (discrete, massed learning trials focused on reducing cognitive</td>
<td>Non-hierarchical (restoration of function through practicing everyday routines</td>
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<td>impairment in a systematic progression)</td>
<td>with compensatory strategies and environmental support)</td>
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<td></td>
<td>Expert-driven (clinician makes decisions)</td>
<td>Collaborative (client, clinician, and others contribute to decision making)</td>
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<td>Survey items*</td>
<td>Drills</td>
<td>Curriculum-based tasks</td>
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<td>Positive behavior supports</td>
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</tbody>
</table>

*Note. The descriptions in this table are directly based on the 2003 ASHA technical report Rehabilitation of Children and Adults with Cognitive-Communicative Disorders After Brain Injury.*

*Complete list of practices included on survey is presented in Table 2.4.*

#### Analysis Methods

Descriptive statistics were used to examine data about professional factors such as years of experience and work setting. Cross tabulations were used to examine frequencies with which participants indicated they used specific practice and, if not, reasons for not using them. To determine the relationships among and between demographic variables and SLP practices, descriptive statistics were used to explore the data followed by inferential analyses using Pearson’s chi-square, multiple regression, and the nonparametric tests Mann-Whitney and Kendall’s Tau. Specifically, five independent variables of interest (caseload size, years since graduation, total number of TBI clients
ever worked with, work setting, and access to experts) were examined in relationship to the total number of contextualized practices chosen and to each individual intervention and service delivery practice using the inferential analysis methods mentioned above. PASW Statistics V18.0 software (IBM SPSS Inc., 2009) was used to conduct all descriptive and inferential analyses in this study.

**Results**

**Description of the Sample**

The initial response rate to the survey was 17% \((n = 160)\). Seventy respondents met the study criteria and completed the survey in its entirety for a final response rate of 7.5%. Descriptive statistics were calculated for the key training and work experience variables (years of experience, pediatric caseload size, work setting, total number of TBI clients ever worked with, TBI training experiences, and access to TBI resources) for the 70 participants who completed the survey in its entirety. Number of years since graduation from an SLP master’s program ranged from 0 to 34 with 11.5 as the median and 13.17 as the mean. Total pediatric caseload size ranged from 10 to 86, with all respondents reporting at least one pediatric TBI client on their current caseloads. Table 2.2 outlines the total number of children or adolescents on participants’ most recent pediatric caseloads and the number of those children or adolescents with TBI.

Of the 70 participants, 85.7% reported their current employment included working in a school setting, with 68.6% reporting working only in a school setting and 17.1% in a non-school setting along with a school setting. The number of clients (children or adults) with TBI with whom participants had ever worked with as an SLP ranged from 1 \((n = 2)\) to over 100 \((n = 5)\) with a mode of 5 clients and nearly a quarter
(24%) of participants working with fewer than 5 clients with TBI over their career. The settings in which participants reported having ever worked with clients with TBI included school, inpatient facility, outpatient clinic, and home health, with the highest number of clients with TBI in inpatient and outpatient facilities, as well as home health (12 participants reported having over 50 clients in these settings), and the lowest number of clients in the school setting (6 participants reported having no clients in this setting).

Table 2.2

*Pediatric Caseloads: Total Clients and Clients with TBI (Current Caseload)*

<table>
<thead>
<tr>
<th>Ages</th>
<th># of clients</th>
<th></th>
<th># of clients with TBI</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Median</td>
<td>Mode</td>
<td>Range</td>
</tr>
<tr>
<td>Preschool</td>
<td>12.2</td>
<td>4.5</td>
<td>1</td>
<td>0-70</td>
</tr>
<tr>
<td>Grades K-5</td>
<td>30.4</td>
<td>30</td>
<td>30</td>
<td>0-80</td>
</tr>
<tr>
<td>Grades 6-8</td>
<td>6.5</td>
<td>1.0</td>
<td>0</td>
<td>0-50</td>
</tr>
<tr>
<td>Grades 9-12</td>
<td>0.9</td>
<td>1.0</td>
<td>0</td>
<td>0-60</td>
</tr>
<tr>
<td>Total (preschool-grade 12)</td>
<td>53.3</td>
<td>57.0</td>
<td>60</td>
<td>10-86</td>
</tr>
</tbody>
</table>

Just over 20% \((n = 15)\) of participants reported having current access to a TBI transition team or consultant affiliated with a school district; 14.2% \((n = 11)\) reported having current access to one affiliated with a hospital (or other agency); and 35.7% \((n = 25)\) reported having someone else to whom they could address clinical questions specific to TBI. Six of the participants \(8.6\%) reported that they were the consultant or part of the transition team. The most frequently reported educational preparation experiences regarding TBI were academic coursework in which TBI was one of many topics \(75.7\%, n = 53\), internships with clients who had TBI \(75.7\%, n = 53\), and journal
articles (71.4%, $n = 50$). The least frequently reported educational experiences were participation in TBI support groups (17.1%, $n = 12$) and watching educational videos (25.7%, $n = 18$). Table 2.3 outlines the frequencies for the educational experiences reported by participants.

Table 2.3

<table>
<thead>
<tr>
<th>Educational experience</th>
<th>$n$</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic coursework in which TBI was one of many topics</td>
<td>53</td>
<td>75.7</td>
</tr>
<tr>
<td>Internship(s) with clients with TBI</td>
<td>53</td>
<td>75.7</td>
</tr>
<tr>
<td>Journal articles</td>
<td>50</td>
<td>71.4</td>
</tr>
<tr>
<td>Relationship(s) with individuals with TBI and their families</td>
<td>36</td>
<td>51.4</td>
</tr>
<tr>
<td>Workshops or conferences</td>
<td>33</td>
<td>47.1</td>
</tr>
<tr>
<td>Websites</td>
<td>29</td>
<td>41.4</td>
</tr>
<tr>
<td>Academic coursework dedicated to TBI</td>
<td>23</td>
<td>32.9</td>
</tr>
<tr>
<td>Educational videos</td>
<td>18</td>
<td>25.7</td>
</tr>
<tr>
<td>TBI support groups</td>
<td>12</td>
<td>17.1</td>
</tr>
</tbody>
</table>

**Description of Speech-Language Pathologist Practices**

The first research question asked about the frequencies with which SLPs reported participating in intervention approaches and service delivery modes that could be characterized as fitting criteria for a contextualized paradigm. Over half of the participants (51.4%, $n = 37$) reported using over 80% of the contextualized practices listed; 98.6% ($n = 69$) of participants used at least one contextualized practice. The most common number of contextualized practices reported was 10 (out of 12 total
contextualized) with 78.6% \((n = 55)\) reporting they used between 7 and 11 of the 12 practices categorized as contextualized. Only four participants did not indicate using more than four contextualized services. Although three participants reported using only contextualized practices, most participants (95.7%) used a combination of contextualized and traditional practices. No respondent used only traditional practices. The most frequently reported contextualized practices were adjusting therapy based on student needs and progress (94.3%), collaborating with other staff (92.9%), and using one activity to target multiple skills (88.6%). Refer to Table 2.4 for complete list of intervention and service delivery practices reported on by respondents.

Table 2.4

**Reported Intervention and Service Delivery Practices**

<table>
<thead>
<tr>
<th>Contextualized practices</th>
<th>n (%)</th>
<th>Traditional practices</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjusted therapy based on student needs</td>
<td>66 (94.3)</td>
<td>Games</td>
<td>59 (84.3)</td>
</tr>
<tr>
<td>Collaboration with other staff</td>
<td>65 (92.9)</td>
<td>Pull-out services</td>
<td>56 (80.0)</td>
</tr>
<tr>
<td>One activity for multiple skills or goals</td>
<td>62 (88.6)</td>
<td>Published therapy materials</td>
<td>53 (75.7)</td>
</tr>
<tr>
<td>Consultation with parents</td>
<td>60 (85.7)</td>
<td>Separate activities for each skill</td>
<td>39 (55.7)</td>
</tr>
<tr>
<td>Social interaction based tasks</td>
<td>60 (85.7)</td>
<td>Drill</td>
<td>38 (54.3)</td>
</tr>
<tr>
<td>Informal education</td>
<td>59 (84.3)</td>
<td>Worksheets</td>
<td>35 (50.0)</td>
</tr>
<tr>
<td>Consultation with teachers</td>
<td>53 (75.7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive behavior supports</td>
<td>52 (74.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Curriculum based tasks</td>
<td>51 (72.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Classroom-based services</td>
<td>43 (61.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monitor student after discharge</td>
<td>29 (41.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staff in-services</td>
<td>12 (17.1)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
After finding that many SLPs reported using a high number of different practices, a follow-up research question was asked to learn whether some SLPs participated in more practices in general or whether a lower number of traditional practices was associated with a higher number of contextualized practices. Kendall’s tau results revealed that there was not a statistically significant correlation (positive or negative) between the number of reported contextualized practices and traditional practices. Thus, there was no trend toward a negative correlational relationship to indicate that a lower number of traditional practices was associated with a higher number of contextualized practices. Nor was there a positive correlation that would suggest that some SLPs merely do more of everything.

**Relationships Between Experience and Practices**

The second research question asked whether training and work experience factors were associated with the contextualized intervention approaches and service delivery modes that SLPs chose. The experience variables (years of experience, pediatric caseload size, work setting, total number of TBI clients ever worked with, and access to experts) were analyzed using descriptive statistics (as reported above) for their association with the practice factors. The Mann-Whitney U test detected a significant difference in the number of contextualized practices used between those who worked in a school setting and those who did not ($U = 171.50, p = .011$), and between those who had access to experts and those who did not ($U = 299.00, p = .001$), with those working in school settings and having access to experts reporting more contextualized practices. Kendall’s tau results indicated that the number of contextualized practices reported were not correlated significantly with caseload size ($\tau = .006, p < .5$) or number of years as an SLP ($\tau = .165, p < .05$), but did show a statistically significant positive correlation with the
total number of clients with TBI with whom participants reported they had ever worked ($τ = .244, p = .006$). In further exploring potential confounders, total number of TBI clients ever worked with was higher for those who reported working in a non-school setting ($U = 182.00, p = .044$) and that caseload total was higher for those who did report working in a school setting ($U = 88.00, p = .000$).

To determine if the addition of access to experts, total clients with TBI ever worked with, and years of experience improved the prediction of number of contextualized practices over and above school setting alone, a hierarchical multiple regression was conducted. Assumptions of linearity, independence of errors, homoscedasticity, unusual points, and normality of residuals were met. When only school setting was used as a predictor (model 1), it accounted for 3% of the variance. When the variables of access to experts, total TBI clients ever worked with, and years of experience were added to the model (model 2), the variance accounted for was 24%. The full model (model 2) was statistically significant, $R^2 = .240$, $F(4, 65) = 5.145, p = .001$, adjusted $R^2 = .194$. In addition, the inclusion of the variables of access to experts, total TBI clients ever worked with, and years of experience led to a statistically significant increase in $R^2$ of .210, $F(3, 65) = 5.998, p = .001$ from model one. Table 2.5 presents the details for both regression models.

When examining each contextualized practice with each key experience variable, years of experience, total TBI clients ever worked with, work setting, and access to experts were significantly associated with using several contextualized practices. Current pediatric caseload size was not associated with the use of any of the contextualized practices. The more years of experience SLPs had, the more they reported consulting
with teachers ($r = .251, p = .036$) and providing in-services to others about TBI ($r = .389, p = .001$). Having worked with more clients with TBI was also positively associated with providing more in-services ($r = .296, p = .013$), as well as with more use of positive behavior supports ($r = .266, p = .026$).

Table 2.5

*Hierarchical Multiple Regression Results for Predictive Value of Experience-Based and Caseload Variables*

<table>
<thead>
<tr>
<th>Step 1</th>
<th>B</th>
<th>SE B</th>
<th>95% CI for B</th>
<th>β</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>7.70</td>
<td>.77</td>
<td>6.16 – 9.24</td>
<td>.17</td>
<td>.000</td>
</tr>
<tr>
<td>School setting</td>
<td>1.22</td>
<td>.84</td>
<td>-.45 – 2.88</td>
<td>.17</td>
<td>.150</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 2</th>
<th>B</th>
<th>SE B</th>
<th>95% CI for B</th>
<th>β</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>5.45</td>
<td>.89</td>
<td>3.67 – 7.23</td>
<td>.18</td>
<td>.101</td>
</tr>
<tr>
<td>School setting</td>
<td>1.28</td>
<td>.77</td>
<td>-.26 – 2.81</td>
<td>.18</td>
<td>.101</td>
</tr>
<tr>
<td>Expert access</td>
<td>1.78</td>
<td>.57</td>
<td>.65 – 2.92</td>
<td>.35</td>
<td>.003</td>
</tr>
<tr>
<td>TBI total</td>
<td>0.01</td>
<td>.01</td>
<td>-.01 - .03</td>
<td>.17</td>
<td>.149</td>
</tr>
<tr>
<td>Years experience</td>
<td>0.05</td>
<td>.03</td>
<td>-.01 - .11</td>
<td>.21</td>
<td>.084</td>
</tr>
</tbody>
</table>

*Note. $R^2 = .03$ for Step 1; $R^2 = .24$ for Step 2; change $R^2 = .21$ for Step 2 ($p = .001$).*

Working in a school setting (either exclusively or in combination with a non-school setting) was positively associated with more consultation with teachers ($X^2(1) = 13.259, p = .000$) and providing class-room based services ($X^2(1) = 8.560, p = .003$).

Providing informal education to other staff ($X^2(1) = 8.451, p = .004$), using curriculum-based tasks ($X^2(1) = 6.452, p = .011$), and monitoring students after discharge ($X^2(1) = 4.062, p = .044$) all showed a statistically significant difference based on having access to experts. For those with access to experts, 93.5% reported providing informal education to other staff (versus 66.7% of SLPs without access), 82.6% reported using curriculum
based tasks (versus 54.2% of SLPs without access), and 50% reported monitoring students after discharge (versus 25% of SLPs without access). Having access to experts did not appear differ based on work setting ($X^2(1) = 1.057, p = .304$). Table 2.6 outlines the relationship between each contextualized practice and each key variable.

**Reasons for Not Using Contextualized and Traditional Practices**

To answer the question about why SLPs might not use specific intervention approaches and service delivery modes, respondents were able to select among the following reasons for not using a practice: *not best practice, didn’t fit the student or situation, scheduling issues, not sufficient resources or support, and not enough confidence or knowledge*. For eight of the contextualized practices, over 70% of those who did not use the practice reported that the reason was because it did not fit the student. Scheduling issues were reported by the second highest proportion of respondents as the reason for not using contextualized practices. Only three contextualized practices were considered not best practice, and each of those was selected by only one respondent.

Regarding traditional practices, not fitting the student was the most frequently reported reason for not using a practice, with over 75% of respondents identifying this reason for half of the traditional practices. The second most common reason for not using traditional practices was that they were not best practice; for half of the practices, 28% to 48% of respondents listed this as the reason for not using them. Table 2.7 shows the frequencies of reasons for choosing not to use contextualized and traditional practices.
Table 2.6
*Point-Biserial Correlation and Chi-Square Results for Contextualized Practices and Key Experience Variables*

<table>
<thead>
<tr>
<th>Key experience variables</th>
<th>Point-biserial correlation</th>
<th></th>
<th>Chi-square</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Years of experience</td>
<td>Pediatric caseload size</td>
<td>Total TBI clients ever</td>
<td>Work setting</td>
</tr>
<tr>
<td></td>
<td>r</td>
<td>p</td>
<td>r</td>
<td>p</td>
</tr>
<tr>
<td>Adjusted therapy based on student</td>
<td>.068</td>
<td>.579</td>
<td>-.164</td>
<td>.175</td>
</tr>
<tr>
<td>Collaboration with other staff</td>
<td>.234</td>
<td>.051</td>
<td>-.087</td>
<td>.473</td>
</tr>
<tr>
<td>One activity for multiple skills</td>
<td>-.022</td>
<td>.856</td>
<td>-.047</td>
<td>.702</td>
</tr>
<tr>
<td>Consultation with parents</td>
<td>.096</td>
<td>.431</td>
<td>-.181</td>
<td>.134</td>
</tr>
<tr>
<td>Social interaction based tasks</td>
<td>.016</td>
<td>.899</td>
<td>-.063</td>
<td>.606</td>
</tr>
<tr>
<td>Informal education</td>
<td>.084</td>
<td>.487</td>
<td>-.066</td>
<td>.587</td>
</tr>
<tr>
<td>Consultation with teachers</td>
<td>.251</td>
<td>.036*</td>
<td>.226</td>
<td>.060</td>
</tr>
<tr>
<td>Positive behavior supports</td>
<td>.161</td>
<td>.184</td>
<td>.044</td>
<td>.720</td>
</tr>
<tr>
<td>Curriculum based tasks</td>
<td>.193</td>
<td>.109</td>
<td>.076</td>
<td>.531</td>
</tr>
<tr>
<td>Classroom-based services</td>
<td>.089</td>
<td>.461</td>
<td>.195</td>
<td>.106</td>
</tr>
<tr>
<td>Monitor student after discharge</td>
<td>.061</td>
<td>.618</td>
<td>-.200</td>
<td>.098</td>
</tr>
<tr>
<td>Staff in-services</td>
<td>.389</td>
<td>.001**</td>
<td>-.126</td>
<td>.300</td>
</tr>
</tbody>
</table>

*p < .05.  **p < .01.  ***p < .001.
Table 2.7

Frequencies and Proportions of Reasons for Not Using Contextualized and Traditional Practices

<table>
<thead>
<tr>
<th># of participants who reported not using practice (out of 70)</th>
<th>Not best practice</th>
<th>Didn’t fit the student</th>
<th>Scheduling issues</th>
<th>Not enough support or resources</th>
<th>Not enough confidence or knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contextualized Practices:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Curriculum-based tasks</td>
<td>19</td>
<td>0 (0)</td>
<td>14 (73.6)</td>
<td>0 (0)</td>
<td>3 (15.7)</td>
</tr>
<tr>
<td>Social interaction-based tasks</td>
<td>10</td>
<td>0 (0)</td>
<td>7 (70.0)</td>
<td>0 (0)</td>
<td>1 (10.0)</td>
</tr>
<tr>
<td>One activity for multiple skills</td>
<td>8</td>
<td>1 (12.5)</td>
<td>5 (62.5)</td>
<td>1 (12.5)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Positive behavior supports</td>
<td>18</td>
<td>0 (0)</td>
<td>15 (83.3)</td>
<td>1 (5.5)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Classroom-based services</td>
<td>27</td>
<td>1 (7.4)</td>
<td>14 (51.8)</td>
<td>12 (44.4)</td>
<td>1 (7.4)</td>
</tr>
<tr>
<td>Consultation with teacher</td>
<td>17</td>
<td>0 (0)</td>
<td>14 (82.3)</td>
<td>2 (11.7)</td>
<td>1 (5.8)</td>
</tr>
<tr>
<td>Consultation with parents</td>
<td>10</td>
<td>0 (0)</td>
<td>5 (50.0)</td>
<td>3 (30.0)</td>
<td>3 (30.0)</td>
</tr>
<tr>
<td>Collaboration with other staff</td>
<td>5</td>
<td>0 (0)</td>
<td>4 (80.0)</td>
<td>1 (20.0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Staff in-services</td>
<td>58</td>
<td>0 (0)</td>
<td>25 (43.1)</td>
<td>18 (31.0)</td>
<td>12 (20.6)</td>
</tr>
<tr>
<td>Information education to staff</td>
<td>11</td>
<td>0 (0)</td>
<td>8 (72.7)</td>
<td>1 (9.1)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Adjust therapy to student needs</td>
<td>4</td>
<td>0 (0)</td>
<td>3 (75.0)</td>
<td>1 (25.0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Monitor following discharge</td>
<td>41</td>
<td>1 (2.4)</td>
<td>29 (70.0)</td>
<td>5 (12.1)</td>
<td>6 (14.6)</td>
</tr>
<tr>
<td>Traditional Practices:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Games</td>
<td>11</td>
<td>1 (9.1)</td>
<td>9 (81.8)</td>
<td>1 (9.1)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Pull-out services</td>
<td>14</td>
<td>1 (7.1)</td>
<td>1 (7.1)</td>
<td>1 (7.1)</td>
<td>1 (7.1)</td>
</tr>
<tr>
<td>Published therapy materials</td>
<td>17</td>
<td>0 (0)</td>
<td>16 (94.1)</td>
<td>0 (0)</td>
<td>1 (5.8)</td>
</tr>
<tr>
<td>Separate activities for each skill</td>
<td>31</td>
<td>15 (48.3)</td>
<td>10 (32.2)</td>
<td>6 (19.3)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Drill</td>
<td>32</td>
<td>12 (37.5)</td>
<td>25 (78.1)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Worksheets</td>
<td>45</td>
<td>13 (28.8)</td>
<td>23 (51.1)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
</tbody>
</table>

\(a\)Percentage = # of participants who reported specific reason / # participants who reported not using specific practice.
Discussion

This study was designed to provide initial answers to questions regarding SLP practices and their alignment with recommendations in the literature regarding TBI. Information about the number of children and adolescents with TBI that SLPs have ever worked with and that are on SLPs’ pediatric caseloads suggested that experience working with students who have TBI in a school setting is limited. This is consistent with the picture presented in the existing literature that SLPs in school settings have limited experience working with students with TBI (Farmer & Johnson-Gerard, 1997; Hux et al., 1996; McGrane & Cascella, 2000; Mohr & Bullock, 2005). It could indicate that students with TBI are not in school or, as suggested by Glang and colleagues (2008) and Schutz and colleagues (2010), they are being under-identified and not being included in school-based SLPs’ caseloads even though their situations may warrant services. Important to note, however, is the fact that, although experience with TBI may be low, many of the respondents in the current study reported providing contextualized services that are supported by experts in the field and did not indicate lack of knowledge as a barrier to providing contextualized services even though that was a choice.

Glang et al. (2008) proposed that the most vital factor contributing to the identification of students with TBI for formal services was the link between hospitals and schools. TBI transition teams, such as those advocated by Glang et al. (2004) and Ylvisaker et al. (2001) can be an important part of this solution. Several of the participants indicated in comments that their local hospital or rehabilitation center sent a representative to a student’s IEP meeting. In addition, 32.8% of participants reported having access to a TBI transition team or consultant, leaving close to two-thirds of
participants without any apparent access to this resource. More positively, however, is that the percentage of participants who reported having access to this type of resource increased to 65.7% when including having anyone with whom to consult about TBI (versus only an official transition team or consultant).

The finding that all but one of the participants used at least one contextualized practice and that none reported using only traditional practices was encouraging. This finding was promising, given that the preponderance of the literature that includes contextualized services as an important element of best practice. One variable of interest stemming from this study was the total number of contextualized practices participants reported using. The work experience factors that showed a statistically significant correlation with this variable were total number of clients with TBI with whom participants had ever worked and having access to experts. This is not surprising in light of the literature suggesting that familiarity with TBI might better equip educators to make appropriate intervention decisions for students with TBI (Mohr & Bullock, 2005) and that involvement of experts such as transition teams is a vital factor in students’ success (Glang et al., 2004; Ylvisaker et al., 2001). Working in a school setting was also correlated with using a higher number of contextualized practices, suggesting that a school setting may be more conducive to using some of the practices.

When individual contextualized practices were examined for associations with work experience factors, several statistically significant findings emerged. Providing in-services to other staff members and using positive behavior supports were correlated with having worked with a higher number of clients with TBI (in any setting) which may indicate that experience specific to brain injury is a key factor. As to be expected, those
who had more years of experience as SLPs reported more consulting, collaborating, and providing in-services than those who had been SLPs for a shorter time confirming that experience in general increases confidence in reaching out to and working collaboratively with others. Having access to experts was associated with using curriculum-based services, providing informal education to other staff, and monitoring students after discharge, supporting further the notion that transition teams or expert consultants may play an important role in ensuring students receive appropriate services following TBI. Not surprisingly, SLPs who worked in school settings reported more consultation with teachers and classroom-based services, again suggesting that certain contextualized practices may be easier to accomplish in a school setting.

**Strengths and Limitations**

Strengths of the current study include the expert panel ratings on the practices included on the survey and new contributions to the literature about frequencies of reported SLP practices and the relationships of these practices and certain demographic variables. Prior studies have provided insight into the knowledge of SLPs regarding basic service provision, but they have not explored how that knowledge translates into clinical action. This study went beyond knowledge of TBI terminology and practice recommendations, and toward an understanding of reports of recent clinical practice choices.

Limitations include the use of a sample of SLPs from one state who are engaged in professional association activities and who attend professional development activities. This group could be expected to be the most informed and interested in the populations of students with TBI. A related issue was the relatively small sample size. In addition, this
study used an experimenter-designed non-standardized survey that included self-reporting of recent past behaviors as its primary mode of data collection. Although the survey items elicited the targeted information about whether SLPs used specific practices, the survey did not glean data about the frequency, timing, and quality of use, which would have added a layer of information important for discovering exactly how SLPs are using contextualized practices. Related is the limitation that respondents selected strategies from a predetermined list. If they had been able to write in their strategies for working with students with TBI, more qualitative information about their practices might have been gleaned. Finally, SLPs most interested in the topic of TBI may have responded in higher numbers and, as a result of their strong interest and likely knowledge, may have used more contextualized practices than other SLPs.

**Conclusions**

The findings of this study suggest that many SLPs have few students with TBI on their caseloads and that, although number of cases is limited, many of these SLPs provide contextualized services that are supported by experts in the field. Opportunities for future research in this area include a follow-up survey that explores the frequency of each practice (versus simply whether or not each respondent used the practice at all), when in the course of intervention the practices are used, and how the SLPs define each practice. Conducting interviews with students with TBI and their families, friends, and school support personnel will help researchers gain deeper insight into the complex issues surrounding successful transition to school following TBI. Improving generalizability by increasing the size of the sample and using random sampling to include a more representative sample will also be an important component of future research.
In addition to providing information about SLP experience and practices regarding TBI, this study contributes important insights into factors that may prevent clinicians from providing contextualized services. Although many SLPs reported using these practices, those that did not use contextualized services provided valuable information about reasons that might prevent SLPs from using these practices. The barriers SLPs reported imply that providers should advocate for creative planning to solve time and scheduling issues, as well as increased education and training to provide SLPs the tools necessary to determine what practices meet the unique needs of their students with TBI. Furthermore, the need for more TBI transition teams or consultants is clear based on the fact that less than two-thirds of the SLPs reported having access to these valuable resources that are supported by prior research. Ultimately, the goal is for students with TBI to experience a successful transition to school and continued success once immersed again in the school environment. SLPs need the knowledge to make effective intervention and service delivery decisions, as well as the time and resources to implement these decisions. This study provides a window into current practices and barriers, contributing a base from which to explore what might facilitate the use of effective methods for supporting children and adolescents living with the challenging consequences of TBI.

References


CHAPTER III
PREPARING PROFESSIONALS TO WORK WITH STUDENTS WITH TRAUMATIC BRAIN INJURY IN EDUCATIONAL SETTINGS

Background

Research indicates that elementary school-age children and adolescents with traumatic brain injury (TBI) require ongoing support for academic and social success using methods that are contextualized and collaborative (DePompei, Epps, Savage, Blosser, & Catelli, 1998; Taylor et al., 2003). Study 1 of this dissertation presented information about a contextualized approach based on an ASHA technical report (2003) and grounded in prior literature, both theoretical (Ciccia, Meulenbroek, & Turkstra, 2009; Savage, DePompei, Tyler, & Lash, 2005) and empirical (Braga et al., 2005; DePompei, Gillette, Goetz, Xenopoulos-Oddsson, Bryen, & Dowds, 2008; Feeney & Ylvisaker, 2008). The contextualized framework facilitates participation in real world activities through a collaborative focus on practicing functional tasks with personally relevant content (ASHA, 2003; Koole dissertation study 1). Collaboration in this context refers to an ongoing partnership that extends beyond an occasional team meeting or the sharing of test results. The respectful interaction between multiple players in the students’ lives is critical for effective and comprehensive assessment, goal-setting, and implementation of services (Szekeres & Meserve, 1998; Ylvisaker & Feeney, 1998).

The collaborative elements that are stressed in the literature are particularly relevant to teachers and speech-language pathologists (SLPs) who have unique roles in working with students with TBI in educational settings. Nevertheless, educators and
SLPs have reported limited experience working with students with TBI in general and working together as members of multidisciplinary teams to support students with TBI in particular (ASHA, 2012; Griffin et al., 2009; Linden, Braiden, & Miller, 2013). Numerous studies also have indicated that SLPs and educators lack confidence, training, and knowledge for addressing the needs of children with TBI in the school setting (Farmer & Johnson-Gerard, 1997; Glang, Todis, Sublette, Brown, & Vaccaro, 2010; Hux, Bush, Evans, & Simanek, 2013; Hux, Walker, & Sanger, 1996; Mohr & Bullock, 2005).

Studies by Evans, Hux, Chleboun, Goeken, and Deuel-Schram (2009) and Hux et al. (2013) have shown that pre-service special education (SPED) teachers are even less knowledgeable about TBI than their SLP counterparts. In fact, Evans and colleagues reported that SPED students about to graduate from university held misconceptions about TBI that were similar to misconceptions held by the general public. Examples of these misconceptions include not realizing that after a head injury it is difficult to learn new things and that complete recovery from a severe TBI is not likely. In reviewing learning materials that college education programs use to prepare their students, Evans et al. (2009) found that many introductory special education textbooks contained minimal information about TBI. The omission of substantial content regarding TBI and their findings that SPED students held significant misconceptions, prompted a statement from Evans and colleagues suggesting that faculty at colleges have “neglected” their duties to adequately prepare professionals to work effectively with students with TBI.

In partial contrast, Hux et al. (2013) found that SLP graduate students—both those entering and exiting master’s programs—held fewer misconceptions than the general public. Exiting SLP graduate students demonstrating more accurate knowledge
than those entering graduate programs. It should be noted that though education was successful at correcting mistaken beliefs about TBI, some misconceptions persisted upon completion of the SLPs’ graduate degrees. For example, graduate students showed low accuracy in recognizing that new learning is difficult for people with TBI, that other cognitive impairments typically accompany memory impairments, that expecting complete recovery after severe TBI is unrealistic, and that TBI is a special education verification category (Evans et al., 2009).

For over 20 years, researchers have concluded that educators’ lack of training is a barrier to successful school reintegration for children with TBI (Blosser & DePompei, 1991; Glang et al., 2010; Linden et al., 2013; Savage, DePompei, Tyler, & Lash, 2005; Schutz et al., 2010). These advocates have argued for more proactive preparation of future and current educational professionals, including SLPs. Glang, Tyler, Pearson, Todis, and Morvant (2004) suggested that improvements in the preparation of those working in educational settings must occur at the university level in order for the needs of children with TBI to be met. Clinical researchers have outlined key elements to include in university training programs, including basic information about pediatric TBI, strategies for designing individualized education plans and intervention, and practice in professional collaboration (Blosser & DePompei, 1991; Dise-Lewis, Lewis, & Reichardt, 2009; Glang et al., 2004).

The potential of interprofessional education programs and case-based learning to improve preparation for health care professionals has been studied by numerous researchers across international and interdisciplinary boundaries (Abu-Rish et al., 2012). Numerous recommendations have been made in the literature supporting best practice in
educating future health care professionals that involve experiences in interprofessional education (IPE) (Gilbert, Yan, & Hoffman, 2010; Goelen, DeClercq, Huyghens, & Kerckhofs, 2006; Lumague et al., 2006; Pinto et al., 2012; World Health Organization, 2010). Thus far, however, there is limited empirical evidence to indicate that IPE can yield improved outcomes that go beyond participants’ perceptions of and reactions to the training experience. A more important question is whether such results extend to improved outcomes in the knowledge and skills of future professionals (Thistlethwait, 2012). In addition, limited evidence exists regarding IPE experiences occurring outside of medical or allied health settings. IPE that has involved educators and SLPs in school settings, in particular, has been implemented mainly with practicing professionals rather than at the university level (Forbes & Welbon, 2001; Hartas, 2004).

Common outcome measures used in IPE studies include scores from student self-assessment and self-perception tools. Examples are the Interdisciplinary Education Perception Scale – IEPS (Luecht, Madsen, Taugher, & Petterson, 1990) and the Readiness for Interprofessional Learning Scale – RIPLS (Parsell & Bligh, 1999). Although positive perceptions of interprofessional collaboration are necessary for IPE to be effective (Greidanus, King, Lo Verso, & Ansell, 2013), self-perception of knowledge and skills may not be reliable or the best measures of targeted competencies. Recent studies have shown that university students tend to overestimate their skills when they respond to questionnaires asking about their perceptions of their own knowledge and skills (Baartman & Ruijs, 2011; Root Kustritz, Molgaard, & Rendahl, 2011). High ratings thus may reflect that students lack the awareness to know that their actual performances might be lower than they think (Sitzmann & Johnson, 2012).
In spite of limitations in the quantity and quality of research related to IPE in educational settings, some research on adult learning does indicate that cooperative or collaborative learning, in which students work together toward a shared purpose, has a positive influence on learning outcomes (McKeachie & Svinicki, 2006). In addition, evidence supports case-based learning as a method that can yield positive learning outcomes in problem solving, information retention, and student self-esteem (Cooper et al., 1990). According to McKeachie and Svinicki, case-based learning involves descriptions of actual problems encountered in the field, which are then solved collaboratively using relevant knowledge, concepts, and skills. Although there appears to be some debate about the most effective time to implement IPE (Morison, Boohna, Moutray, & Jenkins, 2004), some research supports the learning of collaboration and teamwork prior to actual on-the-job experiences in which interprofessional communication is necessary (Barnsteiner, Disch, Hall, Mayer, & Moore, 2007; Carlisle, Cooper, & Watkins, 2004).

To address the critical need for improved preparation of future professionals to work with students with TBI in schools and to fill the gap in the literature regarding IPE in a non-medical context, the current experimental study was designed as a small pilot to compare traditional educational practices with IPE for students earning graduate degrees in speech-language pathology or undergraduate degrees in special education. A semi-randomized controlled experimental design was used to compare the IPE condition with traditional uni-professional classroom instruction for the speech-language pathology (SLP) master’s students. The study also incorporated a pre-post design for the special education (SPED) undergraduate students, all of whom participated in the IPE condition.
Its purpose was to evaluate the effectiveness of IPE activities to prepare these students to provide improved services to meet the unique needs of children and adolescents with TBI in elementary schools.

The research questions for this current pilot project were as follows:

1. Do randomly-assigned preservice SLPs and non-randomly assigned preservice SPED teachers demonstrate increased growth in examiner-rated TBI knowledge and self-rated TBI knowledge after participating in enhanced IPE in TBI compared to SLP students randomly assigned to learn about TBI through traditional, discipline-specific instruction?

2. Do randomly-assigned preservice SLPs and non-randomly assigned preservice SPED teachers demonstrate increased growth in examiner-rated collaboration knowledge and self-rated collaboration knowledge after participating in enhanced IPE in TBI compared to SLP students randomly assigned to learn about TBI through traditional, discipline-specific instruction?

**Method**

**Participants**

Prior to initiation of this project, Human Subject Institutional Review Board (HSIRB) approval was obtained for the recruitment, consent, and experimental procedures. Invitations to participate in this study were issued to all undergraduate special education (SPED) students in an *Introduction to Cognitive Impairments* class (11 students) and all first-year master’s degree SLP students in a *Diagnostics and Appraisal* class (26 students). Informed consent was sought from all invitees; however, they were informed that their participation in the research aspects of the course should be
completely voluntary and that the sealed consent documents (which could be completed or not) would be kept in a locked office and not available to the researcher, who also served as the course instructor, until after the grades for the courses had been awarded. When the documents were unsealed, it was learned that all 36 students (35 of whom were female) had consented to having their course products be used for research purposes. All participants were over 18 years of age and were current master’s or undergraduate students at a private college in a Midwestern state. Invited student participants were aware that two forms of educational experience about working with students with TBI were being compared, but the terms experimental and control were not used in explaining the project to them. It should be noted that the SLP master’s students were all fourth-year undergraduate students participating in a 3-year bachelor’s plus 2-year master’s (3+2) SLP program, which has them complete the first year of their master’s degree as undergraduate students.

**Design**

Twenty-six SLP students were assigned semi-randomly either to the experimental group or the control group. The assignment to group could not be completely random because 7 of the 26 SLP students had reported having work or class schedules that would prevent them from attending the experimental group activities during evening sessions, which were held at that time to coincide with the special education class schedule; thus, these 7 students had to be assigned to the control group, making the assignment nonrandom for a portion of the participants.

The SLP experimental group (SLP-E, $n = 10$) participated in an interprofessional, collaborative training with the SPED students that took place over two weeks of class
time. The SLP control group (SLP-C, \( n = 16 \)) participated in traditional class sessions that covered the information typically covered in that class in the manner in which it is typically taught. Because only 11 students were enrolled in the special education course to start with, it was not feasible to assign them randomly to two groups. All special education (SPED) students in the smaller class were needed to participate in the experimental group so that the participants in the experimental group could work in small groups comprising equal numbers of SLP students and SPED students.

**Procedure for the Experimental Group**

**Sessions for the experimental group.** The experimental group met for two weekly class sessions during the SPED students’ regularly scheduled Monday night 150-minute class period. The first training session comprised the last 90 minutes of the seventh Monday night class of the semester, and the second session, held one week later, lasted the entire 150-minute class period. Thus, the experimental group met together for a total of 240 minutes in the IPE training activities. Table 3.1 displays the breakdown of the session schedules, topics, and instructional methods for both experimental and control groups. It should be noted that, although the experimental group and control group spent approximately the same amount of time in lecture-based learning, the experimental group’s lecture-based learning covered two topics (TBI and collaboration), while the control group’s lecture-based learning covered only one topic (TBI).
Table 3.1

*Training Time Frames, Topics, and Instructional Methods for Experimental Group and Control Group*

| Experimental group (SLP students & SPED students) |  |
| --- | --- | --- |
| **Time frame** | **Topic** | **Instructional method** |
| **Session 1** |  |  |
| 5:00-5:20 | Consent & pretesting | n/a |
| 5:20-6:30 | TBI | Lecture with one small-group activity |
| **Session 2** |  |  |
| 4:00-4:30 | TBI | Lecture |
| 4:30-5:45 | Collaboration | Lecture with one small-group activity |
| 5:45-6:30 | TBI & Collaboration | Interprofessional role plays and small-group discussions |

| Control group (SLP students) |  |
| --- | --- | --- |
| **Time frame** | **Topic** | **Instructional method** |
| **Session 1** |  |  |
| 8:35-8:55 | Consent & pretesting | n/a |
| 8:55-9:50 | TBI | Interactive lecture |
| **Session 2** |  |  |
| 8:35-9:55 | TBI | Interactive lecture with one small-group activity |
| **Session 3** |  |  |
| 8:35-9:20 | TBI | Small group and large group discussion of cases |

**Topics for the experimental group.** Information was presented to the students in the experimental group on two main topics: TBI and professional collaboration. The topic of TBI was broken down into the subtopics of TBI basics (injury definitions, incidence and prevalence information, cognitive communication and processes definitions), common misconceptions about TBI, cognitive communication profiles associated with
TBI, key components to assessment, and key components to intervention. The information that was presented relating to assessment and intervention was consistent with a contextualized approach that is recommended in the literature by numerous experts in the field of TBI rehabilitation.

Approximately 100 minutes were spent directly teaching this information to the students in this group. The topic of collaboration was broken down into the subtopics of basic concept definitions (interaction, consultation, collaboration), understanding frames of reference (personal, professional, self, others), context of interactions, and models of consultation (expert and collaborative). Approximately 75 minutes were spent directly teaching this collaboration information to the students in the experimental group. In addition to the 100 minutes spent teaching about TBI and the 75 minutes spent teaching about collaboration, 45 minutes were dedicated to a role-play activity in which the students had opportunity to synthesize the information about the two topics. This role-play activity is described below in the instructional methods section.

**Instructional methods for the experimental group.** The SLP professor who was one of the co-leaders of the interprofessional training (as well as the author of this dissertation) provided the instruction for the topic of TBI to the control group in their separate class. She presented information in a lecture format supplemented with one small-group brainstorming activity directly related to the lecture material. The SPED professor who was the other co-leader of the interprofessional training provided the instruction for the topic of professional collaboration. He used a PowerPoint lecture format supplemented with one small-group active learning task directly related to the
lecture material. For both topical lectures, the students were provided with guided note outlines.

Following the direct instruction of the two main topics of the training (TBI and collaboration), 45 minutes were dedicated to a role play activity designed to allow the participants the opportunity to synthesize in an interdisciplinary and collaborative hands-on manner the information they learned. There were seven groups of three role players each, with each group consisting of the following roles: 1 general education/classroom teacher, 1 SLP consultant, and 1 SPED consultant. SLP students and SPED students played the roles of general education/classroom teacher, SLP students played the roles of SLP consultants, and SPED students played the roles of SPED consultants in these sequential simulations. Each player received an information sheet corresponding to his or her specific role (to which only the people assigned that particular role had access) that described that participant’s role and details about an elementary student with TBI who was the focus of the case. (See Appendix B for the role information sheets.) All of the general education teacher players received the same information.

Half of the consultant players (SLP and SPED) received information that set them up as “expert consultants,” and the other half of the consultant players (SLP and SPED) received information that set them up as “collaborative consultants.” The role players were not aware of whether they had been given expert or collaborative roles. Prior to dividing into the groups of three, the participants discussed their roles with the other participants who had been assigned the same roles. For example, all of the general education teachers formed a group to discuss the details of their information sheets and how they might portray their assigned roles. Following the role discussions, the
participants separated into their groups of three. Each group of three then joined with another group of three to create three larger groups. Each larger group had at least one role play group with expert consultants (role play type 1) and one role play group with collaborative consultants (role play type 2). Within those larger groups, the individual role play groups acted out their scenarios and discussed their perceptions of the experience (as both role players and observers). Table 3.2 outlines these relationships.

Table 3.2

Interprofessional Training Role Play Types and Larger Groups

<table>
<thead>
<tr>
<th>Large Group 1</th>
<th>Role play type 1</th>
<th>Role play type 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 gen ed teacher</td>
<td>1 gen ed teacher</td>
<td></td>
</tr>
<tr>
<td>1 SLP consultant (expert)</td>
<td>1 SLP consultant (collaborative)</td>
<td></td>
</tr>
<tr>
<td>1 SPED consultant (expert)</td>
<td>1 SPED consultant (collaborative)</td>
<td></td>
</tr>
<tr>
<td>Large Group 2</td>
<td>Role play type 1</td>
<td>Role play type 2</td>
</tr>
<tr>
<td>---------------</td>
<td>-----------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>1 gen ed teacher</td>
<td>1 gen ed teacher</td>
<td></td>
</tr>
<tr>
<td>1 SLP consultant (expert)</td>
<td>1 SLP consultant (collaborative)</td>
<td></td>
</tr>
<tr>
<td>1 SPED consultant (expert)</td>
<td>1 SPED consultant (collaborative)</td>
<td></td>
</tr>
<tr>
<td>Large Group 3</td>
<td>Role play type 1</td>
<td>Role play type 2</td>
</tr>
<tr>
<td>---------------</td>
<td>-----------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>1 gen ed teacher</td>
<td>1 gen ed teacher</td>
<td></td>
</tr>
<tr>
<td>1 SLP consultant (expert)</td>
<td>1 SLP consultant (collaborative)</td>
<td></td>
</tr>
<tr>
<td>1 SPED consultant (expert)</td>
<td>1 SPED consultant (collaborative)</td>
<td></td>
</tr>
</tbody>
</table>

*To even out the numbers of students, there had to be two of the same role play type in the larger group 3.

Procedure for the Control Group

**Sessions for the control group.** The control group met during the SLP students’ regularly scheduled Tuesday/Thursday morning class during the same two-week period when the experimental group was meeting on Monday evenings. To ensure the students in the control group had approximately the same amount of time in lecture-based learning as the students in the experimental group, one out of the four 75-minute class sessions over the course of the two-week training period was cancelled. The control group thus
met together for a total of 195 minutes compared to 240 minutes for the experimental group.

**Topics for the control group.** Information was presented to the students in the control group on one main topic: TBI. As with the interprofessional training sessions for the experimental group, the topic of TBI was broken down into the subtopics of TBI basics (injury definitions, incidence and prevalence information, cognitive communication and processes definitions), common misconceptions about TBI, cognitive communication profiles associated with TBI, key components to assessment, and key components to intervention. The information that was presented relating to assessment and intervention for the control group also was consistent with a contextualized approach that is recommended in the literature by numerous experts in the field of TBI rehabilitation. Collaboration was not a separate topic presented to this group; however, collaboration between disciplines was mentioned as a key component of both assessment and intervention.

Approximately 150 minutes were spent directly teaching TBI information to the students in this group. An additional 45 minutes were spent in small groups reviewing specific cases of children and adolescents with TBI. Thus, even though the control group did not role play different professional perspectives, they did engage in group problem-solving activities. (See Appendix C for case studies that the control group reviewed.)

**Instructional methods for the control group.** The SLP professor (dissertation author) who was a co-leader of the interprofessional training with the experimental group also was the professor who regularly taught the diagnostics course to the SLP students. She taught the information about TBI to the control group in the manner she typically
teaches it in this course. Although the information presented to the control group about TBI was the same as the information presented to the experimental group, a slower pace could be taken in working through the material, as only one topic needed to be covered with the control group versus two (TBI and collaboration) with the experimental group. Since the participants in the control group were all SLP students, more time was spent discussing examples specifically related to the role of the SLP in situations the participants might find themselves in once they enter the workforce. In addition to the lecture-based material and small-group brainstorming activity, the professor provided three case examples for the students to work through in small groups. During this activity, the professor joined the different groups to listen to their discussions and facilitate the direction of conversation. Following each case, the small groups reported their main ideas to the larger group and the professor provided additional insights and clarifications regarding each case.

**Measures**

The four primary variables of interest for this study were examiner-rated TBI knowledge, self-rated TBI knowledge, examiner-rated collaboration knowledge, and self-rated collaboration knowledge. Examiner-rated knowledge was defined for this study as the ability to demonstrate understanding of facts, concepts, and procedures on a written response to questions about a case study. Self-rated knowledge (confidence) was defined as a form of awareness about what one knows. It was measured by response to self-rating scale (ABI Parenting/Teaching Proficiencies Scale; Dise-Lewis et al., 2009).

The goals of the instruction for both groups were to increase their competence and confidence in providing intervention services for school-age students with TBI. The
additional goals of the experimental interprofessional instructional condition were to increase participants’ confidence and competence in the collaborative components of intervention for school-age students with TBI. The following operational definition of collaboration was used: “Interpersonal collaboration is a style for direct interaction between at least two co-equal parties voluntarily engaged in shared decision making as they work toward a common goal” (Friend & Cook, 1992, p. 7). To address limitations of previous studies, the outcome measures included a more direct measure of students’ knowledge about TBI in the form of a series of six essay questions concerning a case study. This was in addition to a self-rating scale regarding TBI intervention proficiencies. Table 3.3 specifies the variables and their corresponding measurement tools.

Table 3.3

Variables of Interest and Corresponding Descriptions, Measurement Tools, and Score Ranges

<table>
<thead>
<tr>
<th>Variable name</th>
<th>Variable description</th>
<th>Measurement tool</th>
<th>Possible score range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examiner-rated TBI Knowledge</td>
<td>Examiner ratings of participants’ responses to a series of short-answer questions about a case study</td>
<td>Questions 1, 2, 3a, and 5 on the TBI case study</td>
<td>0–21</td>
</tr>
<tr>
<td>Self-rated TBI Knowledge</td>
<td>Participants self-ratings of their proficiencies in providing support for a student with TBI</td>
<td>ABI Parenting/Teaching Proficiencies Scale</td>
<td>16–80</td>
</tr>
<tr>
<td>Examiner-rated Collaboration Knowledge</td>
<td>Examiner ratings of participants’ responses to three short-answer questions about a case study questions focused on the element of collaboration</td>
<td>Questions 3b, 4, and 6 on the TBI case study</td>
<td>0–3</td>
</tr>
<tr>
<td>Self-rated Collaboration Knowledge</td>
<td>Participants’ self-rating of their proficiency in collaborating with the parent/school team in supporting a student with TBI</td>
<td>Item #12 on the ABI Parenting/Teaching Proficiencies Scale</td>
<td>1–5</td>
</tr>
</tbody>
</table>

Note. See Appendices D and E for the measurement tools in their entirety.
**Experimenter-designed pre-post case study with short answers.** Two of the primary variables of interest for this study were scores on pre-post tests of examiner-rated knowledge and collaboration regarding TBI principles and intervention and TBI collaboration using a single case study. The case study consisted of a brief description of a child with TBI followed by six open-ended, short-answer questions. (See Appendix E for case study and related questions.) Two scores were drawn from this six-item test. The examiner-rated knowledge score was drawn from ratings of four short answers on questions about knowledge of TBI and TBI intervention. The examiner-rated collaboration score was drawn from ratings of three short answers to questions designed to probe knowledge of the collaborative components of TBI intervention.

*Examiner-rated TBI knowledge.* Questions 1, 2, 3, and 5 were scored with a multi-part, multi-point scoring guide in which each question had its own rubric. (Note that, in addition to being used for the TBI knowledge score, Question 3 was also used for the collaborative knowledge score, but it was scored using a different rubric than for the examiner-rated TBI knowledge score.) Each question included in the examiner-rated TBI knowledge score was open-ended. Questions 1, 2, and 3 each required three answers worth 2 points each, making 6 total points possible for each question. Question 5 required one answer, which had to include three separate components, each worth 1 point, making 3 the total points possible for question 5. The total points possible for the examiner-rated TBI knowledge score was 21. The scoring guide rubric was based on recommendations in the literature that services for children and adolescents with TBI be contextualized in nature (ASHA, 2003; Braga, Da Paz, & Ylvisaker, 2005; Deidrick & Farmer, 2005; Feeney & Ylvisaker, 2003, 2008; Glang, Todis, Cooley, Wells, & Voss, 1997; Savage
et al., 2005; Ylvisaker & Feeney, 2009). The researcher scored all of the answers for each pre- and posttest. An SLP graduate assistant scored a subset \((n = 20)\) of the pre- and posttests. Cohen’s kappa indicated there was moderate agreement between the two raters, \(k = .523, p < .0005\) (Altman, 1999). Appendix F contains the scoring rubric for the TBI knowledge score.

**Examiner-rated collaboration knowledge.** Questions 3, 4, and 6 each were scored with either a 1 or a 0, where 1 indicated that the student included appropriate collaborate elements in his or her answer and 0 indicated he or she did not. The scoring rubric for this area appears in Table 3.4.

Table 3.4

*Examiner-Rated Collaboration Knowledge*<sup>a</sup> *Assessment Questions, Rubric, and Sample Answers*

<table>
<thead>
<tr>
<th>Case Study Question</th>
<th>Scoring Rubric</th>
<th>Sample Answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q 3. What specific things could you do (as part of Ben’s team) to facilitate success in the classroom and on the playground?</td>
<td>1 = included a collaborative elementamelment</td>
<td>1 = work with teacher to set up visual aids/schedules 0 = teach him how to take notes</td>
</tr>
<tr>
<td>Q 4. Think about the team aspect of providing services for Ben. List some DOs and DON’Ts to collaborating with the other professionals on his team.</td>
<td>1 = included at least one key collaboration concept&lt;sup&gt;b&lt;/sup&gt;; answer had to be directly related to collaboration 0 = did not include any key collaboration concepts; provided intervention suggestions not related to professional collaboration</td>
<td>1 = acknowledge and respect opinions and ideas; be open to others’ suggestions 0 = give the teacher information about TBI; give Ben choices in therapy</td>
</tr>
<tr>
<td>Q 6. List the things you think are the most important aspects of working with students with TBI. (Or the things most important to remember and/or do when working with students with TBI.)</td>
<td>1 = mentioned or indicated collaboration as an important aspect 0 = did not mention or indicate collaboration as an important aspect</td>
<td>1 = good communication between teachers, parents, and therapists 0 = be consistent; use compensatory strategies</td>
</tr>
</tbody>
</table>

<sup>a</sup> The examiner-rated collaboration knowledge score is the sum of the scores for questions 3b, 4, and 6.

<sup>b</sup> Key collaborative elements were judged according to our operational definition of collaboration from Field and Cook (1992).
The scores from each question were summed to create the resulting collaborative score (range 0–3 points). All collaborative elements were judged against the operational definition of collaboration from Friend and Cook (1992). Questions 3 and 6 required answers about service delivery ideas for children and adolescents with TBI. Even though the answer provided may have been correct in terms of appropriate TBI intervention (in which case it would receive full points when scored under the TBI knowledge rubric described previously), it did not receive a point under the collaboration rubric if it did not include collaborative elements. For all three questions, collaborative elements had to include more than just mention of another professional, as this did not necessitate true collaboration. For example, the answer “have the teacher write out his directions” suggests another professional is involved and hints at the possibility of collaboration, but collaboration is not explicitly stated; it is not clear that the SLP directing the teacher fulfilled the operational definition of collaboration. On the other hand, the answer “meet with teacher to develop classroom strategies such as writing out directions” would fulfill the operational definition of collaboration and thus receive 1 point because there is explicit indication that professionals are working together to solve a problem (versus one professional telling another professional what to do). The researcher scored all of the pre- and posttests.

To evaluate scoring reliability, a certified and licensed SLP experienced in TBI intervention independently scored a random subset ($n = 30$) of the pre- and posttests. Cohen’s kappa indicated there was “very good” agreement between the two raters, $k = .895$, $p < .0005$ (Altman, 1999). Table 3.4 outlines the questions used for the collaborative score and the associated scoring rubric.
**ABI Parenting/Teaching Proficiencies Scale.** Self-rated TBI knowledge was measured by using the ABI Parenting/Teaching Proficiencies Scale (Dise-Lewis et al., 2009). This scale was developed by Dise-Lewis and colleagues as a method for assessing the impact of their training program on self-ratings by teachers and parents of their competencies related to acquired brain injury. The ABI Parenting/Teaching Proficiencies Scale asks respondents to rate themselves on a list of 16 competencies that are critical for working in an educational setting with children and adolescents with TBI. Example items on the rating scale ask examinees to rate their competence in the ability to: (a) *Link student’s problems/symptoms to underlying neurodevelopmental deficits/challenges*, (b) *Structure the environment to support positive behavior and effective learning*, (c) *Identify the causes of a recurring behavior problem*, and (d) *Collaborate with parent/school team*. Dise-Lewis and colleagues did not report psychometric properties of the scale, but did state that the scale was piloted with parents and school personnel as they developed their BrainSTARS training program for which it was designed. The authors’ evaluation of the BrainSTARS training program (Dise-Lewis et al., 2009) indicated increased parent and teacher proficiencies related to experience in working with students with acquired brain injury. For the purposes of the current study, two variables were generated from the ABI Parenting/Teaching Proficiencies Scale: TBI self-rating score (all 16 questions on scale) and collaboration self-rating score (item #12 on scale).

**Analysis Plan**

The data were analyzed by examining the four variables derived from the pre- and post-measures outlined in Table 3.3. The variable of self-rated TBI knowledge was analyzed within groups across time (pre-post) and between groups (SLP-C, SLP-E,
SPED) using a $2 \times 3$ mixed ANOVA. The variable of examiner-rated TBI knowledge did not have homogeneity of variances and since transforming the variable was unsuccessful, this variable was analyzed with a one-way ANOVA to examine differences between the three groups at posttest and with dependent $t$ tests to look at differences from pretest to posttest for each group. The variables of examiner-rated collaboration knowledge and self-rated collaboration knowledge did not meet assumptions for parametric testing; therefore, the non-parametric tests Kruskall-Wallis and Wilcoxon Signed Rank were used to examine differences between groups and within groups over time, respectively, for these measures. Pearson’s chi-square analyses were completed to examine possible relationships between specific knowledge components and group membership. In addition, independent $t$ tests were used to compare knowledge and change scores between the SLP students as a whole and the SPED students. PASW Statistics V18.0 software (IBM SPSS Inc., 2009) was used to conduct all inferential analyses in this study.

**Results**

Table 3.5 outlines the descriptive statistics for the four key variables. It shows the medians, means, and standard deviations for all pre- and posttest measures for each group that participated in the training.
Table 3.5

* Medians, Means, and Standard Deviations for all Pre- and Posttest Measures by Group *

<table>
<thead>
<tr>
<th></th>
<th>Examiner-rated TBI Knowledge</th>
<th>Self-rated TBI Knowledge</th>
<th>Examiner-rated Collaboration Knowledge</th>
<th>Self-rated Collaboration Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>Mdn</td>
<td>Mdn</td>
</tr>
<tr>
<td>SLP-C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pre</td>
<td>12.47 (3.38)</td>
<td>38.50 (7.27)</td>
<td>1.0</td>
<td>3.0</td>
</tr>
<tr>
<td>post</td>
<td>17.43 (2.11)</td>
<td>61.08 (6.34)</td>
<td>1.0</td>
<td>4.0</td>
</tr>
<tr>
<td>SLP-E</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pre</td>
<td>10.30 (3.43)</td>
<td>42.56 (7.99)</td>
<td>1.0</td>
<td>2.5</td>
</tr>
<tr>
<td>post</td>
<td>17.85 (2.94)</td>
<td>59.50 (7.35)</td>
<td>1.0</td>
<td>4.0</td>
</tr>
<tr>
<td>SPED</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pre</td>
<td>5.45 (3.42)</td>
<td>55.45 (9.52)</td>
<td>0.0</td>
<td>4.0</td>
</tr>
<tr>
<td>post</td>
<td>9.80 (5.33)</td>
<td>61.30 (9.37)</td>
<td>1.0</td>
<td>5.0</td>
</tr>
</tbody>
</table>

**TBI Knowledge**

The first research question asked whether SLPs (senior level/beginning master’s students) and SPED teachers (all junior year undergraduate students, except one senior) differed in their acquisition of TBI knowledge (self-rated and examiner-rated) based on whether or not they participated in an enhanced interprofessional education (IPE) preservice training. For self-rated TBI knowledge, assumptions of no outliers, normality, homogeneity of variances and covariances, and sphericity were met for all three groups across the variable. Since these assumptions were met, the question was answered with a 3 (groups: SLP-C, SLP-E, SPED-E) × 2 (times: pre and post) mixed ANOVA to examine between group and within group differences. For examiner-rated TBI knowledge, the assumption of homogeneity of variances was not met for the variable at posttest. Because transforming the variable was not successful, the question about differences in examiner-rated TBI knowledge was answered by running one-way ANOVAs and dependent t tests.
(versus mixed ANOVA) to analyze differences between groups and across times within each group.

**Self-rated TBI knowledge.** Results of the analysis showed that there was a statistically significant interaction between type of training and time (pre- and posttest) on self-rated TBI knowledge, \( F(2, 30) = 4.942, p = .014, \) partial \( n^2 = .248, \) indicating that self-rated TBI knowledge scores across time were different depending on the type of training students received. This suggests a positive answer to the question whether the students assigned to the interprofessional training would show different scores in self-rated TBI knowledge compared to those students learning through the traditional, discipline-specific instruction. When looking at scores at pretesting and posttesting separately to breakdown the interaction, Tukey post-hoc analyses revealed that the SPED students had statistically significantly higher self-rated TBI knowledge scores at pretest than the students in the SLP-C group (\( M = 16.955, 95\% \text{ CI} [8.947, 24.962], p = .000 \)) and in the SLP-E group (\( M = 12.899, 95\% \text{ CI} [3.832, 21.966], p = .004 \)). At posttesting, there were no statistically significant differences between the groups.

There was a significant main effect of group on participants’ self-rating scores, \( F(2, 30) = 6.234, p = .005 \); however, the only statistically significant post-hoc difference was between the SPED group and the SLP-C group (\( M = 8.171, 95\% \text{ CI} [2.410, 13.933], p = .004 \)). The main effect of time also showed a statistically significant difference from pretest to posttest, \( F(1, 30) = 76.665, p < .001, \) with scores increasing for all groups from pre-test to posttest (\( M = 15.453, 95\% \text{ CI} [11.849 \text{ to } 19.058], p < .001 \)). There was a statistically significant effect of time on self-rated TBI knowledge for the SLP-C group (\( F(1, 13) = 2962.286, p < .0005, \) partial \( n^2 = .820 \)), the SLP-E group (\( F(1, 8) = 1440.056, \)
and the SPED group \((F(1, 9) = 312.050, p = .007, \text{partial } n^2 = .573)\). This suggested that all three groups increased significantly in the area of self-rated TBI knowledge.

When collapsing the SLP-C and SLP-E groups into one group, and comparing those means with the means of the SPED students, independent \(t\) tests showed there was no statistically significant difference between the two groups for self-rated TBI knowledge at posttest, but there was at pretest, with the SPED students \((M = 55.45, SD = 9.52)\) ratings themselves higher than the SLP students \((M = 40.02, SD = 7.64)\), \(t(33) = 5.135, p < .0001\). When looking at the amount of change that occurred from pretest to posttest rather than at the actual posttest scores, however, independent \(t\) tests revealed a statistically significant difference between groups for self-rated TBI knowledge. On this measure, the SLP students, who started lower, showed more change \((M = 19.52, SD = 10.77)\) than the SPED students \((M = 7.90, SD = 7.18)\), \(t(31) = 3.111, p = .004\).

**Examiner-rated TBI knowledge.** A one-way ANOVA was used to examine differences in examiner-rated knowledge between the three groups after the training. Dependent \(t\) tests were used to look at differences in examiner-rated knowledge from pretest to posttest for each group. In the analysis of group difference data on examiner-rated knowledge, homogeneity of variances was violated as assessed by Levene’s Test of Homogeneity of Variance \((p = 0.11)\); thus, a Welch ANOVA was used. Examiner-rated TBI knowledge was statistically significantly different between the three groups, Welch’s \(F(2, 15.97) = 9.47, p = .002\). The SLP-C group’s scores \((M = 17.43, SD = 2.11)\) and SLP-E group’s scores \((M = 17.85, SD = 2.94)\) were higher than the SPED group’s scores \((M = 9.80, SD = 5.33)\). Games-Howell post-hoc analysis revealed that the mean
difference between the SLP-C and SPED groups (7.63, 95% CI [2.84, 12.42]) was statistically significant ($p = .003$) and the mean difference between the SLP-E and SPED groups (8.05, 95% CI [3.01, 13.09]) was statistically significant ($p = .002$). The difference between the SLP-C and SLP-E groups was not statistically significant.

The analysis of differences across time showed that the SLP-C group scored higher at posttest ($M = 17.43$, $SD = 2.11$) than at pretest ($M = 12.37$, $SD = 3.45$), as did the SLP-E group (posttest $M = 17.85$, $SD = 2.94$; pretest $M = 10.30$, $SD = 2.43$) and the SPED group (posttest $M = 9.80$, $SD = 5.33$; pretest $M = 5.45$, $SD = 3.42$). The SLP-C group showed a statistically significant mean increase in examiner-rated TBI knowledge from pretest to posttest, $M = 5.067$, $t(14) = 5.23$, $p < .0005$, with an effect size of $d = 1.35$. The SLP-E group also showed a statistically significant mean increase in examiner-rated TBI knowledge from pretest to posttest, $M = 7.55$, $t(9) = 5.40$, $p < .0005$, with a slightly higher effect size, $d = 1.71$. The difference between the two effect sizes (adjusted for sample size) was not significant ($p = 0.278$). Finally, the SPED group showed a statistically significant mean increase in examiner-rated TBI knowledge from pretest to posttest, $M = 4.35$, $t(9) = 5.23$, $p = .024$, with a somewhat smaller effect size, $d = .85$.

Again, when collapsing the SLP-C and SLP-E groups into one group, and comparing those means with the means of the SPED students, independent $t$ tests showed that examiner-rated TBI knowledge was significantly higher for the collapsed groups of SLP students at both pretest ($M = 11.63$, $SD = 3.50$, $t(34) = 4.775$, $p < .0001$) and posttest ($M = 17.60$, $SD = 2.42$, $t(33) = 6.013$, $p < .0001$) than for the SPED students at pretest ($M = 5.45$, $SD = 3.42$) and at posttest ($M = 9.80$, $SD = 5.33$). In looking at the amount of
change that occurred from pretest to posttest, change scores for examiner-rated TBI knowledge were not statistically significantly different between the two groups.

**Collaboration Knowledge**

The second research question asked whether SLP students and SPED students differed in their acquisition of collaboration knowledge (examiner-rated and self-rated) based on whether or not they participated in an enhanced interprofessional preservice training. For the two continuous variables of examiner-rated collaboration knowledge and self-rated collaboration knowledge, the data were not normally distributed and the assumption of homogeneity of variances was not met. Because transforming the variables was not successful in meeting the assumptions of normal distribution, the differences in examiner-rated collaboration knowledge and self-rated collaboration knowledge between groups at posttest and within each group across time were analyzed separately using nonparametric statistical tests.

**Self-rated collaboration knowledge.** Kruskall-Wallis analyses were run to examine the differences in self-rated collaboration knowledge scores between groups at the time of pretesting and at the time of posttesting. Results indicated that the distribution of scores across groups was the same at the time of pretesting ($p = .052$) and posttesting ($p = .364$). Related-samples Wilcoxon Signed Rank tests were used to analyze differences within each group for self-rated collaboration knowledge. Results indicated that there were significant differences in self-rated collaboration knowledge over time for the SLP control group ($p = .003$) and the SLP experimental group ($p = .018$), but not for the SPED students ($p = .112$).
Examiner-rated collaboration knowledge. Kruskall-Wallis analyses were also run to examine the differences in examiner-rated collaboration knowledge scores between groups at the time of pretesting and at the time of posttesting. Results indicated that the distribution of scores across groups was the same at the time of posttesting ($p = .208$), but that there were significant differences in scores between groups at pretesting ($p = .048$). Pairwise comparisons were performed with a Bonferroni correction for multiple comparisons, indicating that examiner-rated collaborative knowledge differences between the SPED students and the SLP control group ($p = .029$) and the SPED students and the SLP experimental group ($p = .030$) were not significant with the adjusted critical value of .0167 for significance. Although the differences were not significant, the SPED students’ median score was lower ($Mdn = 0$) than that of each SLP group ($Mdn = 1$). Related-samples Wilcoxon Signed Rank tests were used to analyze examiner-rated collaboration score differences within each group. Results indicated that the SPED students demonstrated statistically significant change in examiner-rated collaboration knowledge over time ($p = .035$), while the SLP control and experimental groups did not ($p = .096$ for both groups).

Discussion

The research questions asked whether preservice SLPs and preservice SPED teachers who participated in an enhanced interprofessional training would show increases in TBI knowledge (examiner-rated and self-rated) and collaboration knowledge (examiner-rated and self-rated) regarding services for students with TBI that would exceed those of preservice SLP students who did not receive the enhanced training. It was hypothesized in light of the interprofessional training, that the SLP-E group would
have advantages over the SLP-C group in collaboration knowledge scores, but not in TBI knowledge scores.

Results showed that self-rated TBI knowledge differed across time depending on the type of training students received, with SPED students rating themselves higher than the SLP students at pretesting. All three groups’ self-rating scores increased significantly from pretest to posttest. All groups also increased in their examiner-rated TBI knowledge from pre- to posttest; however, there was no significant interaction between type of training and examiner-rated TBI knowledge. This is consistent with the original hypothesis with regard to all three groups increasing their examiner-rated TBI knowledge; both the control group and the experimental group received the same information about TBI. It was not anticipated that self-rated TBI knowledge would be different over time depending on group membership.

The results also indicated that there were no statistically significant differences between the three groups at posttesting in either self-rated or examiner-rated collaboration knowledge. Self-rated collaboration knowledge increased significantly over time for both SLP groups, while examiner-rated collaborative knowledge increased over time for the SPED group. This is not consistent with the original hypothesis that emphasizing collaboration through an interdisciplinary training experience would lead to increased scores in collaboration knowledge for the experimental group when compared to the control group. Since there was improvement across all three groups, the change cannot be attributed to the interprofessional training.

This study was designed to evaluate the effectiveness of IPE activities to prepare SLP and SPED students to provide services to meet the unique needs of children with
TBI in elementary schools. The literature portrays a picture in which educators (including school-based SLPs) are under prepared to work with students with TBI. This depiction suggests a critical need for improved preparation at the university level in order that preservice teachers and SLPs might join the workforce better equipped to facilitate success for students with TBI.

The findings of this study are consistent with the literature in that the SPED students showed limited knowledge of TBI at pretest. Their examiner-rated TBI knowledge increased following the training. Because there was no control for this group, it is impossible to attribute their knowledge growth to the experimental activities. According to their professor, however, had they not participated in this project, they likely would not have had specific educational experiences related to the topic. This lack of opportunity to gain exposure to TBI is particularly concerning when coupled with the research pointing to the omission of substantial content regarding TBI in special education textbooks (Evans et al., 2009). It is worth exploring how IPE experiences might lead to exposure to topics that otherwise would not be emphasized in the curriculum of SPED students.

Because the IPE training emphasized collaboration between disciplines, it is important to consider evidence from the collaborative knowledge measures used in the pre- and posttesting. Examiner-rated collaboration knowledge differed across groups before the training with both groups of SLP students demonstrating higher examiner-rated collaborative knowledge than the SPED students. After the training, however, examiner-rated collaborative knowledge scores did not differ between the three groups. Discouraging in one sense is the fact that the training was directed at improving
collaborative knowledge, but did not result in improved examiner-rated scores based on the training for the SLP-E compared with the SLP-C students. On the other hand, it is encouraging when looking at the changes over time for the SPED students as they made statistically significant gains in examiner-rated collaborative knowledge.

There appears to be an inverse relationship between the scores at pretest and the level of change at posttest. Both groups of SLP students had higher examiner-rated collaborative knowledge scores at pretest than the SPED students, but did not show a statistically significant change in these scores over time, whereas the SPED students did. In contrast, the SPED students showed higher self-rated collaboration knowledge than SLP students (when compared with SLP students as a whole), but did not demonstrate a significant increase in scores over time, whereas both groups of SLP students did. The higher the score at pretest, the less room there was to achieve change over time. This might be somewhat explained by the statistical phenomenon of regression toward the mean, as they were the students with the lowest examiner-rated collaborative knowledge scores before testing, but the fact that they could earn significantly higher scores on an essay test designed to measure their knowledge about collaboration was encouraging. The range of scores for the two measures of collaboration (examiner-rated and self-rated) was small (0–3 and 1–5 respectively), which also may have contributed to the lack of significant change over time.

Encouraging was the finding that, for the SLP students, emphasizing collaboration did not appear to distract from learning overall TBI information, which can be seen in the absence of a significant difference between the SLP experimental group and the SLP control group in their examiner-rated TBI knowledge after the training and in their
change scores. Since the SPED students who participated in the interprofessional training did not have a control group, it is impossible to attribute any changes to the training. It is, however, promising that the SPED students increased in their examiner-rated knowledge scores regarding both collaboration and TBI from pre- to posttesting.

As might be expected from the literature, the SLP students as a whole differed significantly from the SPED students at the outset of the study regarding examiner-rated TBI knowledge. This is consistent with the findings of studies by Hux and colleagues (2013) and Evans and colleagues (2009), which suggested that SLP students would demonstrate more accurate understanding of TBI than their SPED counterparts. The SPED students in this study were not exposed to hands-on experiences with children and adolescents with TBI, nor had their course content up to this point covered information about TBI, which is similar to the learning experiences of the SPED students described by Evans and colleagues. Conversely, the SLP students had learned basics about TBI and cognitive communication in several classes prior to their enrollment in the diagnostics course. They observed clients with cognitive communication disorders and some of them also had clients with TBI and/or cognitive communication disorders in their program’s on-campus clinic. Stark as these differences in knowledge and experience are, they point to the critical need for increased exposure to TBI for SPED students, the importance of including multiple learning opportunities regarding TBI for SLP students, and the need to collaborate and share expertise in practice.

Another interesting aspect to the results of this study is the self-rated knowledge in general. The SPED students had higher self-rated TBI knowledge than the SLP students at the time of the pretest even though they demonstrated significantly lower
examiner-rated TBI knowledge. There seems to be a connection between self-rated knowledge and exposure to a topic: the more students know, the more they realize there is to know, and thus the lower they may rate themselves. This connection is one that is evident in the literature as found by Baartman and Ruijs (2011), who observed that students who were assessed by their instructors to be “low performing” were more likely to overestimate their own skills. Root Kustritz, Molgaard, and Rendahl (2011) also examined student self-assessment and found that undergraduate social work students overestimated their abilities earlier in their learning careers as compared to underestimating their skills when they graduated. The results of those studies have parallels to this study in that the SPED students had not been exposed to TBI-specific information and experiences, perhaps making them less aware of the complexity of working with the TBI population. In addition, the connection between low actual performance and high self-assessment was reflected in this study’s finding that the SPED students, who scored lower on examiner-rated TBI knowledge, rated themselves higher in TBI knowledge than the SLP students who actually demonstrated more knowledge.

**Strengths and Limitations**

A strength of the current study is its focus on the education of pre-professionals who will soon enter fields in which work with students with TBI is critical. The literature is clear that educators (pre-service and practicing)—including school-based SLPs—require improved preparation for working with students with TBI (Hux et al., 2013; Linden et al., 2013). Studies also suggest that services for students with TBI are lacking in part due to limited knowledge and experience of educators (Blosser & DePompei, 1991; Schutz et al., 2010). This study’s focus on IPE adds to the limited research on IPE
in non-medical contexts. In addition, the collaborative elements of the training mirror the interdisciplinary situations in which the SLP and SPED pre-professional students may soon find themselves working. The collaborative elements reflect best practice recommendations for working collaboratively across disciplines with children and adolescents with TBI (Szekeres & Meserve, 1998; Ylvisaker & Feeney, 1998). Other strengths of this study include the semi-random assignment of SLP students to control and experimental groups and the use of a previously researched self-rating scale.

Limitations include the fact that this study used non-validated measures to assess knowledge and that the researcher was also the person implementing the training. Although the study included semi-random assignment to groups, it should be noted that it was not possible to do complete random assignment nor was it possible to do random selection of the sample. Another is the absence of a comparable control group for the SPED students.

Conclusions

Based on the need for improved evidence-based preprofessional education for those planning to work with students with TBI and the demand for collaboration between SLPs and teachers, replication of this study is warranted. Future implementations of this type of training might include a collaboration perception measure such as the Interdisciplinary Education Perceptions Scale – IEPS (Luecht et al., 1990), which has been used in multiple studies (e.g., Goelen et al., 2006; Pinto et al., 2012) to assess the perceptions of the learning experience. Although using a perception scale alone will not provide evidence that IPE increases knowledge and skills needed to collaborate effectively for students with TBI, knowing how the participants perceived the training is
an important variable. For learning to occur in IPE contexts, participants must perceive the experience as relevant (Greidanus et al., 2013). In addition, a control group for the SPED students would add to the robustness of the study design and would likely yield more telling results regarding the effects of the interprofessional training on the SPED students’ knowledge outcomes.

The literature is clear about the lack of preparation of educators regarding TBI. This study’s results are consistent with that research in that the SPED students knew significantly less about TBI than their SLP counterparts. Research also indicates that IPE results in positive patient outcomes and improved student knowledge (Greidanus et al., 2013). Furthermore, the literature suggests that acquiring interprofessional collaboration skills is more effectively learned at the pre-service level than on-the-job (Barnsteiner et al., 2007; Carlisle et al., 2004).

Considering the current IPE research and the fact that this study’s participants’ examiner-rated TBI knowledge was not compromised by emphasizing collaboration, the interprofessional training module could replace the traditional learning module presented in the university’s diagnostics class, and equally important, be added as a recurring module in the SPED cognitive impairment class. This proposed change in curriculum could address three goals. First, it would provide needed education to SPED students about TBI in a way that would still allow the other critical components of their coursework to be delivered. Second, it would allow for pre-service interprofessional collaboration experiences for both SLP and SPED students. And finally, it would expand opportunities and research for IPE outside of the health care setting and into the
education arena, with the ultimate goal of extending the benefits of IPE to students with TBI in our elementary and high schools.

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CHAPTER IV
MULTI-PARTICIPANT PERSPECTIVES OF SUCCESSFUL SCHOOL REINTEGRATION FOR STUDENTS WITH TRAUMATIC BRAIN INJURY

Background

Available research supports the notion that children and adolescents with traumatic brain injury (TBI) are at risk for poorer outcomes in school than their non-injured peers, particularly in the areas of academics, social acceptance, participation in age-appropriate activities, and quality of life (Bedell, Cohn, & Dumas, 2005; Cronin, 2001; Galvin, Froude, & McAleer, 2010; Law, Anaby, DeMatteo, & Hanna, 2011; Yeates & Taylor, 2006; Van Tol, Gorter, DeMatteo, & Meester-Delver, 2011; Ylvisaker et al., 2005). Given that approximately 475,000 children survive TBIs each year in the United States (CDC, 2012) and that even mild injuries can have notable impact on one’s day-to-day functioning (Kirkwood et al., 2008), a substantial number of children may be trying to get back to life with questionable supports, and with the added challenges that TBI brings (Glang, Tyler, Pearson, Todis, & Morvant, 2004; Glang et al., 2008).

Many studies on outcomes following pediatric TBI have focused on educational achievement, behavioral issues, and neuropsychological testing (Anderson et al., 1997; Fay et al., 1994; Kinsella et al., 1997). Researchers have used a variety of measures to quantify outcomes of pediatric TBI, ranging from functional measures such as frequency of behavioral outbursts, amount of school work completed (Feeney & Ylvisaker, 2003), and special education services (Yeates & Taylor, 2006) to formal tests such as the Wechsler Intelligence Scale for Children–Third Edition (Wechsler, 1991; used by Fay
et al., 2009) and Rivermead Behavioral Memory Test for Children (Wilson et al., 1991; used by Anderson et al., 1997). The information gleaned from these studies is crucial to understanding the sequelae associated with pediatric TBI and the resulting consequences. Without this awareness, health practitioners, rehabilitation specialists, educators, and families would be unable to plan intervention and implement supports.

Participation scales have contributed information about person-centered outcomes. These scales typically focus on whether or not an individual participates in specific activities, the frequency with which they participate, and their overall ability to participate. Law and colleagues (2011) and Galvin et al. (2010) used similar participation scales to describe patterns of home, community, and school participation of children with TBI. Despite the differences in reporting sources for the scales (parents, children), both research teams (Law et al., 2011; Galvin et al., 2010) found that, overall, children with brain injuries participated in fewer activities than their typically developing peers, with the exception of Law and colleagues’ finding that the children with brain injuries showed similar patterns of participation to their peers in social events. The next step is to add information about how students and their parents view levels of participation and related outcomes, along with their perceptions on the nature of services that help them achieve greater success as they define it.

In addition to participation scales, researchers have used health-related quality of life scales to assess outcomes after pediatric TBI (Limond, Dorris, & McMillan, 2009; McCarthy et al., 2005; Renstrom, Soderman, Domellof, & Emanuelson, 2012; Souza, Braga, Filho, & Dellatolas, 2007). Renstrom and colleagues used a health survey and an additional questionnaire about life situation to measure outcomes in adolescents and
young adults with TBI. The health survey was a formal tool addressing general health (i.e., physical, mental, emotional) (Ware & Sherbourne, 1992). It was supplemented by a researcher-designed questionnaire that asked yes/no questions about the respondents’ TBI and related consequences (e.g., “Does the brain injury affect what you do during your leisure time?”). If respondents indicated difficulty in any area on the questionnaire, they were given opportunity to rate the degree of their problem on a scale of 1–5. Overall, the investigators found that over half of the respondents conveyed poorer health when compared to normed controls. More relevant to the current study, 44% of the respondents reported their brain injuries had negative effects on their schooling regardless of whether or not they were satisfied with the support they received at school. In other words, some students reported they were pleased with the support they received, but still indicated they had negative academic outcomes.

Limond et al. (2009) used a combination of quality of life scale and supplemental questionnaire similar to Renstrom et al. (2012). The generic health-related quality of life measurement tool they used (PedsQL, Varni, Seid, & Kurtin, 2001) addressed physical, emotional, social, and school functioning by asking parents to what degree their children experienced occurrences such as teasing and doing things peers do (social functioning), as well as forgetting things and trouble keeping up with school work (school functioning) (McCarthy et al., 2005). Limond and colleagues found that children with TBI experienced poorer quality of life as reported by their parents. In addition, they found that most of the parents who reported that their children had severe cognitive and emotional problems also reported that their children did not receive special education services.
Missing from these studies are the perspectives of the children and their families regarding the importance of the questionnaire items and their views of what constitutes successful participation. There are a number of studies that look in-depth at the experiences of children and families with the recovery process after TBI, including aspects of school re-entry (Bedell et al., 2005; Rodset, 2008; Roscigno & Swanson, 2011; Sharp, Bye, Llewellyn, & Cusick, 2006). Currently lacking from the literature, however, is deeper, multi-perspective information about how children, families, and professionals define success and what they describe as the indicators of a successful transition back to school. The current qualitative study is designed to help fill that gap in the literature.

Use of Interview Methods

The current study seeks to define what constitutes success for students with TBI within their unique contexts, but it is not alone in recommending a qualitative approach to gain deeper understanding of the phenomena associated with recovery from pediatric TBI. Some researchers have explored outcomes through in-depth interviews with children and adolescents with TBI, and/or their families and professionals with whom they worked. Roscigno and Swanson (2011) used qualitative interviews to explore the experiences of parents after their children sustained TBIs. Their findings indicated that, although parents were grateful that their children survived, they grieved the loss of the individuals their children once were and described struggles they faced when meeting the new demands of their families.

Rodset (2008) interviewed six adolescents to explore their perspectives on coping with their school situations post injury. Details that emerged about what factors were instrumental to their school return were coping strategies, individual help from teachers,
experiencing success in a subject, and, most importantly, parental support. The major barriers to academic success were cognitive deficits following their TBI. Roscigno, Swanson, Vavilala, and Solchany (2011) also interviewed children and adolescents to gain their perspectives on life after TBI. Their findings that related to transition back to school included themes of *everything is hard work* and *longing for everydayness*. The children in their study described examples of support or lack of support in the context of social relationships rather than specific supports for academic success. Roscigno et al. reported that the children also addressed the need for members of their circles to make rehabilitation “more fun” and to see them as important members of their communities.

Sharp and her colleagues (2006) interviewed eight adolescents with TBI and their parents over the course of two years. Return to school was identified as a significant concern for adolescents with acquired brain injury and their parents. They noted that the practical issue of organizing the return was one aspect of the concern, including the need to educate teachers and peers about TBI as one of the critical pieces. A more central theme of their findings was “fitting back in” (p. 774). Although the researchers did not explicitly ask about what constituted success, the adolescents and their parents did indicate that positive outcomes were associated with educated teacher responses to the adolescents’ situations and implementation of appropriate accommodations; these were factors that seemed to allow the students to participate once again in school and to “fit back in.”

Souza and colleagues (2007) incorporated components of all three types of outcome measures: standardized achievement tests, quality of life scales, and interviews. They obtained responses from both the children and their parents with findings that
indicated parents expressed more concerns related to their children’s physical, cognitive, social, and educational situations than the children expressed about their own situations. This study provided evidence that parents and children may differ in their perspectives about success following TBI, suggesting that future research should include multiple sources and viewpoints in assessing outcomes and examining appropriate tools for outcome measurement.

**Need for Additional Perspectives on “Success”**

The results from these interview and participation scale studies suggest that definitions of success can vary from person to person, but that similar themes among different families do exist. In their interviews with 16 families of school-aged children with brain injuries, part of what Bedell, Cohn, and Dumas (2005) sought to discover was what mattered most to parents regarding their children’s participation in specific activities. Although they did not explicitly ask about definitions of success, the authors were able to infer meaning about successful participation based on the parents’ strategies for promoting their children’s involvement in age-appropriate activities. For example, teaching strategies for the specific skills required for participation in activities or events suggested that parents deemed it important that their children be able to participate at a level similar to that of peers without being teased. Another example is the strategy of regulating cognitive and behavioral functioning, which Bedell and colleagues indicated was used by parents mainly in order to promote safety and manage daily routines, indicating that another possible component of successful participation is simply completing the activity safely and in its entirety (as opposed to needing constant reminders to attend to necessary components of the task).
The work of Mealings and Douglas (2012) is a good example of the greater depth of understanding that might be gleaned from qualitative interviews when compared to the other methods of data collection described earlier. They conducted in-depth interviews with three adolescents with TBI about their perspectives on return to school following TBI. The authors pointed out that traditional measures of educational success such as academic scores and grade levels passed might not be the most important aspects to students, and that students’ perspectives might differ from those of their parents and teachers. At the heart of their study was the unanswered question, “What constitutes success at school?” (p. 3). Mealings and Douglas’ findings indicated that students placed significant value on positive relationships as influencing their school enjoyment regardless of their academic achievements. These data suggest the need for further research into varied perspectives on what represents success that go beyond general measures of academic accomplishments. Their study, along with the work of Roscigno, Swanson, Vavilala, et al. (2001), also highlights the importance of consulting with children and adolescents themselves about valued outcomes instead of relying on the input of parents, educators, and health professionals.

In response to frustrations from families that adequate services for their children with TBI are difficult to obtain in the educational setting, researchers have proposed models for statewide educational system supports (Dettmer, Ettel, Glan, & McAvoy, 2014; Glang et al., 2004), family advocacy and collaboration training (McLaughlin, Glan, Beaver, Gau, & Keen, 2013; Sohlberg, McLaughlin, Todis, Larsen, & Glang, 2001), and teacher preparation (Blosser & DePompe, 1991; Glang, Todis, Sublette, Brown, & Vaccaro, 2010; Linden et al., 2013; Savage, DePompe, Tyler, & Lash, 2005; Schutz et
Despite these proposals for introducing system changes and training programs, there is still consensus in the pediatric outcome literature that important questions remain unanswered. Many researchers conclude that more work must be done in understanding participation and defining success from multiple perspectives versus the exclusive input of one group of individuals involved with a child or adolescent’s recovery (e.g., parents, teachers, rehabilitation professionals) (Bedell, 2004; Di Battista, Soo, Catroppa, & Anderson, 2012; Law et al., 2011; Mealings & Douglas, 2010; Roscigno, Swanson, Vavilala, et al., 2011; Sharp et al., 2006).

Heterogeneity of the population necessitates that outcome measurements be person-centered and as individualized as possible; however, this approach presents unique challenges with students with TBI who experience deficits in communication and deficit awareness (Souza et al., 2007). Nalder and colleagues (2012) found, for example, that students with greater injuries reported greater perceived success than those with less severe injuries. This illustrates that input from children with TBI may not always be congruent with their abilities and participation levels (particularly as measured by generic outcome scales). Although challenging in some respects, their perceptions of success present hope that positive outcomes may be experienced despite significant injuries. Their perceptions also support the notion that definitions of success require multiple perspectives, not least of which include the perspectives of the child with TBI.

Given the gaps in the literature regarding a deeper, multi-perspective understanding of success following pediatric TBI, the current qualitative study was designed to provide insights into how children and adolescents with TBI, and their parents, SLPs, and teachers experience the transition back to school. The aim was to seek
their definitions of successful school reintegration, as well as factors they perceive to be facilitators of and barriers to that success.

**Methods**

**Design**

This qualitative research study draws on the broad theoretical approach of phenomenology as described by Creswell (2013) and Lindseth and Norberg (2004). They explained phenomenology as developing a description of the essence or “essential meaning” (Lindseth & Norberg, 2004) of a shared human experience for a group of individuals. Phenomenology asserts that meaning about reality is derived from our experiences with reality and that our perceptions provide evidence for what is real (Moustakas, 1994). These assertions provide the theoretical foundation for this study’s attempt to define successful school reintegration based on the perceptions of those who have lived the back-to-school transition. Van Manen’s (1997) emphasis on phenomenology as exploring the rich meaning found in everyday life experiences also supports phenomenology as the theoretical basis for this study.

Pope, Ziebland, and Mays (2006) noted that the connection between theoretical approach and actual research practice is not straightforward, particularly in health sciences research, which tends to focus on real life concerns rather than philosophical positions. In order to avoid diluting the complexity of phenomenology, this study adopts an approach similar to that of Lindseth and Norberg (2004), who described their work not as “pure” phenomenology, but rather as staying true to the principle of describing the essence of a common experience with the aim of contributing insights and understanding.
The phenomenon that is the focus of this study is success as experienced by children and adolescents who have transitioned back to school following a traumatic brain injury and those who have supported the children and adolescents. I explored this phenomenon using semi-structured interviews, which have been validated as a means to obtain rich descriptions from participants and explore meaning regarding a phenomenon of interest (Creswell, 2013; DiCicco-Bloom & Crabtree, 2006). The semi-structured interviews in this study comprised a set of predetermined open-ended questions with prompt suggestions as necessary. Some prompts were preset, whereas other prompts were contingent on participants’ responses and incorporated their vocabulary, as suggested by Britten (2006). Also in accordance with Britten’s guidelines, all participants were asked the same initial questions in order to provide consistency in answers and care was taken to ask questions that were neutral, sensitive, and clear to the participants. (See Appendix G for the interview guide.) I conducted all of the interviews face-to-face in each participant’s home or place of work.

Participants

For this study, members of three groups (10 people total) were interviewed, wherein one group was equivalent to one child or adolescent with TBI, one parent of the child or adolescent with TBI, and a speech-language pathologist (SLP) who provided rehabilitation and/or transition services for that child or adolescent. One of the three groups also included a fourth member—a teacher who worked with the adolescent with TBI after return to school. The participants were recruited intentionally to reflect diversity within a common experience (Barbour, 2008). The purposeful nature of the sampling for this study also followed Creswell’s (2013) suggestion to choose a small
group of participants (3 to 15 individuals) who not only have shared an experience, but who the researcher thinks can shed light on the phenomenon under question.

Participants were recruited through a local brain injury rehabilitation organization that agreed to make initial contact with families who might be appropriate for this study. Once families indicated interest in the study, they were contacted, and informed consent was obtained to complete the interviews and to contact SLPs and teachers to also participate in the study. Inclusion criterion for the children and adolescents were (1) sustained a documented moderate or severe TBI; (2) currently enrolled in elementary, middle, or high school and attending part- or full-time at the time of the interview OR attended part- or full-time in the past two years; and (3) judged by their parents as able to participate in an interview process. Exclusion criteria were (1) premorbid diagnosis of a significant developmental or psychiatric disability (e.g., autism or emotional impairment), (2) current diagnosis of a psychiatric disorder, and (3) concerns on anyone’s part that the interview process might have an adverse effect on the youth with TBI.

Analysis

Phenomenology provided the theoretical foundation for this study. The actual techniques for the analysis followed a general inductive approach as described by Thomas (2006). This approach to data analysis was chosen because the main purpose of this study is practical in nature—that is, to provide insights that might inform clinical practice. Thomas described a general inductive approach as one that “allows research findings to emerge from the frequent, dominant, or significant themes within the raw data” (p. 238). This approach to data analysis is common in health and social science research and, although inductive, I chose it because it can be guided by the research
questions and study aims. Other qualitative methodologists also support an integrated approach in which the researcher uses a combination of inductive and deductive reasoning (Bradley, Curry, & Devers, 2007; Pope et al., 2006; Stockrocki, 1997; Taylor-Powell & Renner, 2003). Central to all qualitative research is the classification of segments of data into categories or themes in order to portray an understanding of an experience from the perspective of the people who have lived that experience (Creswell, 2013; Pope et al., 2006; Ryan & Bernard, 2003; Taylor-Powell & Renner, 2003). The steps used in this study to accomplish that aim of qualitative research are described below.

First, I listened to and read the interviews to gain an overall sense of meaning. As I completed these initial reviews of the interviews, I attempted to suspend my biases and be open to the words and intentions of the participants. In addition, I wrote down impressions that came to mind as I immersed myself in the data. Next, I divided the transcripts into pieces of text (units) that seemed “important or meaningful in some way” (Maxwell, 2013, p. 107). Each unit addressed a single topic, but was not necessarily restricted to a single meaning or theme. I used parts of the text that were related to the topic of my study; minimal amounts of text were excluded because my interview questions were geared towards the specific phenomenon under study. Units varied in size from several words or phrases to short paragraphs, although many were passages consisting of several sentences. In order to preserve the context of the meaning and stay true to the participants’ stories, I purposefully kept the units broad rather than refining them to isolated words or phrases (Taylor-Powell & Renners, 2003). In this way, the
units often carried more than one meaning or theme. These were then identified during the coding process.

After dividing the text into units, I condensed those units to their basic meaning units using the participants’ own words. I used this method of data reduction to focus on the salient information as specifically suggested by Lindseth and Norberg (2004). Next, I literally cut the transcripts into the basic meaning units, pasted them to individual index cards, and sorted them into piles of categories. In doing so, I coded the basic meaning units into many different categories, which I later grouped to form the four main themes. After I identified the four main themes that emerged from the data’s categories, I developed subthemes that described the distinctive aspects of each theme.

Although I have described the steps here as sequential actions, analyzing the data was actually an iterative process. I wrote memos at all points of the research project to document my reflections on the raw data and impressions of emerging meaning. Memos also were used to acknowledge my biases that may have affected interpretation of the data. As themes and subthemes were identified, I went back and forth between the original transcripts and the basic meaning units, also consulting with memos of initial impressions and discussing the findings with members of my dissertation committee.

Results

Participants

A total of 10 people participated in interviews for this study. They comprised three groups each centered around an elementary or high school student with TBI. For the purposes of this report, they have been given pseudonyms: Dylan (16 years old), Grace (16 years old), and Annie (7 years old). Each group included a parent and an SLP;
Dylan’s group also had a former teacher. The three SLPs interviewed were rehabilitation specialists employed by the rehabilitation organization through which the participants were recruited. The one teacher who was interviewed was Dylan’s former middle school teacher. Each student with TBI is introduced below and relevant characteristics are outlined in Table 4.1.

Table 4.1

*Student Participant Characteristics at Time of Injury and at Time of Interview*

<table>
<thead>
<tr>
<th></th>
<th>Dylan</th>
<th>Grace</th>
<th>Annie</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>At time of injury:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>9 years</td>
<td>14 years</td>
<td>4 years</td>
</tr>
<tr>
<td>Year in school</td>
<td>4th grade</td>
<td>8th grade</td>
<td>1st day of preschool</td>
</tr>
<tr>
<td>Injury details</td>
<td>Pedestrian in MVA</td>
<td>Injured (legs)</td>
<td>Passenger in MVA</td>
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<tr>
<td></td>
<td>Significant physical</td>
<td>requiring short-term use of</td>
<td>Initial loss of voice</td>
</tr>
<tr>
<td></td>
<td>complications and surgeries</td>
<td>wheelchair</td>
<td>No persisting motor speech</td>
</tr>
<tr>
<td></td>
<td>Persistent spasticity</td>
<td>No persisting motor speech</td>
<td>disorder</td>
</tr>
<tr>
<td></td>
<td>Significant persisting</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>dysarthria</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inpatient rehab stay</td>
<td>10 months</td>
<td>2 weeks</td>
<td>4 months</td>
</tr>
<tr>
<td>Time of school re-entry</td>
<td>Started part time 13 months post injury</td>
<td>Started part time 2 months post injury</td>
<td>Started part time 11 months post injury</td>
</tr>
<tr>
<td><strong>At time of interview:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>16 years</td>
<td>16 years</td>
<td>7 years</td>
</tr>
<tr>
<td>Time post-injury</td>
<td>7 years; 5 months</td>
<td>1 year; 7 months</td>
<td>2 years; 8 months</td>
</tr>
<tr>
<td>School situation</td>
<td>Part time high school</td>
<td>Entering sophomore year of an</td>
<td>Entering 3rd grade in a</td>
</tr>
<tr>
<td></td>
<td>sophomore in self-contained</td>
<td>urban high school</td>
<td>rural school district</td>
</tr>
<tr>
<td></td>
<td>POHI classroom in an urban/suburban high school</td>
<td>Regular education classes with 504 plan</td>
<td>Regular education classroom with IEP</td>
</tr>
<tr>
<td>Living situation</td>
<td>Lives with mother in a single family home in a suburban area</td>
<td>Lives with mother in an apartment complex in an urban area</td>
<td>Lives with father and younger sister in a single family home in rural area</td>
</tr>
<tr>
<td>Other members of group</td>
<td>Mother Rehabilitation SLP</td>
<td>Mother Rehabilitation SLP</td>
<td>Father Rehabilitation SLP</td>
</tr>
<tr>
<td></td>
<td>Middle school teacher</td>
<td></td>
<td></td>
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</tbody>
</table>
**Introducing Dylan.** Dylan is a 16-year-old high school student who sustained a severe TBI at age 9 as a pedestrian in a motor vehicle accident. His injuries included significant physical and neurological damage. He spent 10 intense months in an inpatient rehabilitation facility before returning home. Upon returning home, he participated for 2 months in home-based therapies before returning to school part time. When he first returned to school, he was in a self-contained 5th grade classroom for students who are physically or otherwise health-impaired (POHI). After 5th grade, he attended middle school for 4 years where he was also in a self-contained POHI classroom. Both Dylan and his mother spoke fondly of his middle school teacher and his time in that classroom. Dylan then transitioned to high school into another self-contained POHI classroom. He attended full-time for his first year, then part-time for his second. Dylan and his mother reported extreme frustration with his high school placement and teachers. In light of these frustrations, Dylan will not be returning to school next year. Since the time of his accident he has undergone countless surgeries and procedures for musculoskeletal and neuromuscular problems. Dylan lives with his mother, who has been his primary caregiver since the accident. He experiences persistent spasticity throughout his body and his intelligibility is greatly affected by significant dysarthria. He continues to experience cognitive deficits that affect his everyday functioning. Despite his challenges, Dylan has an easygoing nature and uses his relatively strong language skills to tell others about his interests and to share his sense of humor. He continues to receive home-based PT, OT, and SLP services through the same rehabilitation organization that has managed his care since his discharge from inpatient rehab.
Introducing Grace. Grace is a 16-year-old high school student who sustained a TBI as a passenger in a motor vehicle accident at age 14. She spent 2 weeks in an inpatient rehabilitation facility prior to returning home where she currently lives with her mother. She participated in home-based therapies and had a homebound teacher before returning to school 2 months after her accident. She started the second semester of 8th grade, attending for half days until she built up enough stamina to attend full days again. Her mother reported that even though Grace technically failed the 8th grade, school administrators allowed her to pass and continue on to high school. Prior to the accident, Grace was an average student receiving mainly Bs and Cs. Now she struggles to pass her classes. At the time of the interview, she had just completed her first year of high school and was enrolled in summer courses to retake several subjects in which she did not get a passing grade. Since returning to school after her accident Grace has been in all regular education classes. In 9th grade, there was a 504 plan in place to provide accommodations; however, Grace, her mother, and her rehabilitation SLP reported that there was minimal follow through on many of the accommodations. She has received short-term home-based SLP services on two separate occasions since her discharge from inpatient rehabilitation, although her rehabilitation SLP and her mother indicated that Grace could benefit from more SLP support. She continues to receive home-based PT services for residual lower extremity issues. Despite her executive functioning challenges, Grace showed strong interpersonal communication skills and clearly indicated her desire to do well in school, to earn her high school diploma, and to be able to take advantage of future opportunities that an education would provide.
Introducing Annie. Annie is a 7-year-old elementary school student who sustained a TBI in a motor vehicle accident on the way to her first day of preschool. Her mother died in the accident and Annie now lives with her father and younger sister. Annie spent 4 months in an inpatient rehabilitation facility before coming home. Once home, she participated in home-based therapies for 7 months and then returned to school in the fall to begin kindergarten. Since returning to school, Annie has been in a regular education classroom with an IEP for necessary accommodations. Her father and SLP described a supportive and collaborative school environment in which they feel Annie has done well. Over the past several years, Annie’s father and rehabilitation SLP have noticed progress in areas of difficulty, but have also noted gaps appearing between Annie’s academic performance and that of her classmates. These gaps are consistent with what is described in the literature as “growing into a deficit” (Dennis et al., 2014). Annie is a delightful girl who loves using her language skills for creative story telling. She experiences tremendous support from her father, grandparents, teachers, and therapists.

Themes and Subthemes

Four main themes emerged from the interview data. I have labeled these (1) communication and connection; (2) knowledge and awareness; (3) services, support, and strategies; and (4) student attributes and circumstances. Within these four themes are a set of subthemes that characterized the participants’ interview responses regarding their experiences with transition back to school, which are outlined in Table 4.2. The themes and subthemes presented address definitions of success, as well as barriers to and facilitators of success.
Table 4.2

*Themes, Subthemes, and Examples of Issues from the Interviews*

<table>
<thead>
<tr>
<th>Themes</th>
<th>Subthemes</th>
<th>Examples of Issues from Interviews</th>
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</thead>
</table>
| Communication and connection        | Communication is critical for obtaining support for success | Lack of phone calls from school
                                             |                                                       | School and rehabilitation therapists regularly emailing each other |
|                                     | Connection with others is an important element of success | Need for regular student-teacher appointments
                                             |                                                       | Concern that teachers do not know student |
| Knowledge and awareness             | School awareness and understanding of TBI | Positive view about school situation in light of school’s awareness of what student needs
                                             |                                                       | Frustration that school implemented inappropriate interventions due to lack of experience with TBI |
|                                     | Access to knowledge for parents and students | Not receiving information about student assignments
                                             |                                                       | Parent not being allowed in student’s classroom |
| Services, support, and strategies   | Process of obtaining support           | Feeling that it was a fight to get support
                                             |                                                       | Community desire to support student |
|                                     | Appropriateness of services to student with TBI | Student judging instruction as not at his level
                                             |                                                       | Not considering individual student needs |
|                                     | Recommendations for interventions and approaches | Sensitivity to student wishes
                                             |                                                       | Hiring new staff |
| Student attributes and circumstances| Current successes                       | Improvement in cognitive skills since onset of TBI
                                             |                                                       | Effective use of strategy |
|                                     | Current struggles                       | Failing classes
                                             |                                                       | Cognitive-linguistic deficits |
|                                     | Future hopes and concerns               | Doing what other kids are doing
                                             |                                                       | Graduate from high school |
Communication and connection. Almost all of the participants talked about communication as a critical element of their experience. One aspect they discussed related to the exchanges between the different players involved in the transition back to school (e.g., parents and teachers, teachers and therapists). Another aspect of communication they talked about was the presence or absence of relationships that were associated with connecting with others.

Subtheme 1: Communication is critical for obtaining support for success. The adult participants all portrayed communication as one of the most critical factors in determining successful reentry or for obtaining needed services. Grace’s mother summarized their family’s experience by saying, “I mean, it’s one of the biggest things right there is the communication.” The most emphasized communication was between school and families. Grace’s SLP clearly articulated an example of mutual communication failures between school and the student, as well as school and home, which despite communication efforts on the part of the SLP, hindered the effective use of potential supports:

There was, in the 504, written in there that she could have notes from each class, and that got lost in translation. You know, the counselor said that’s available; Grace should have that. He kind of seemed to put that on the teacher. And then there was a disconnect between the teacher and Grace partially because Grace, I think, didn’t ask for what she needed and the teachers didn’t seek that out to give it to her … So she wasn’t receiving what she needed from the 504. So I had quite a few phone calls and emails back and forth with the counselor and even helped Grace in one of our sessions advocate for herself and email the teacher. Now, a negative factor was that her mom wasn’t paying the bill for the Internet, so the email had to go through the speech therapist to the teacher.

Members of two of the groups (Dylan’s and Grace’s) talked at length about the inadequate communication between home and school, particularly the readiness of the school to divulge information or to communicate with parents, students, and
rehabilitation specialists. Dylan’s mother talked about the difficulty of the back-to-
school process because “we couldn’t get phone calls back.” Other comments also
addressed the communication barrier to getting what the parents felt the students needed.

One of the teachers decided they were going to teach him how to shave with a
manual razor. And we were not informed of this. We were not asked about that.
(Dylan’s mother)

They were like, we’ll call you when we can set up the 504. Never got a call.
Nothing. Because they said I had to come in and sign papers and stuff. I never got
nothing and I didn’t know anything. (Grace’s mother)

An obvious sense of frustration came through as the parents talked more about the
inadequate communication from school teachers and administrators. Both Dylan’s mother
and Grace’s mother showed strong emotions when expressing how the lack of connection
with school prevented them from knowing what their children were doing at school and
thus from being in a position to help their children.

I am not allowed in his classroom. It is none of my business what they do at
school … I’m not sure [about the social aspects because I’m not there] … And
I’m not allowed to be there. (Dylan’s mother)

Like I said, communication … You know, communication with … I would tell
the teachers [what I need] when I would go to parent teacher conferences … I
need her to be able to bring a slip of what she’s done that week so I can help her
… And I can never get it. They would always say, “Well, we need Grace to do it.
We need Grace to go down to the office.” And I can’t be at the school. And she
don’t have time to do it between the time she gets out of her last class to get to her
locker, get to the office, get the printout, and still make it to the bus on time … I
mean, you got a computer in the classroom. Just print it out! I mean, I know the
junior high has it. The elementaries have it. You know, it takes 30 seconds and
you could do it in the morning. You know? (Grace’s mother)

Members of Grace’s group talked only about their negative experiences with
communication; however, Dylan and his mother had positive comments in contrast to
their experiences with lack of communication. Prior to his current placement in high
school about which he and his mother expressed dissatisfaction, Dylan had a different experience in middle school.

The communication book [worked well]. That worked real good. They write down what he did every hour so when he comes home I don’t get told, “We played Wii all day.” (Dylan’s mother)

She [middle school teacher] made it go so smoothly and I could call her anytime of the day. Oh yeah [she was available]. I still can call her now. (Dylan’s mother)

Dylan’s middle school teacher talked about having honest communication with Dylan’s mother, even about difficult topics. She also mentioned that she communicated openly with her students about different abilities in the classroom.

And finally we sat with [Dylan’s mother] and it’s one of the hardest things to do is say, “You know, this isn’t working.”

And I tell them that the weirdest thing about TBI … is that your brain injury’s different from yours, and yours is different from yours. We talked about it as a class.

The adult members of Annie’s group also contributed many comments that pointed to effective communication that supported Annie’s transition back to school.

The little things [are working out well]. I know the teacher talks to [rehabilitation therapist] and all little things like try this and try that … Little things, you know, cuz they [school] are aware of everything she needs and they talked to [rehabilitation therapist] … And all that email back and forth. (Annie’s father)

Grace’s and Annie’s SLPs, who were both rehabilitation specialists involved in the back-to-school transition, pointed to the need for regular communication with the student and family in order to support the chances of success.

[To increase the likelihood of success, everyone could] keep communicating with the family, especially dad because he really was in the know. Maternal grandmother was really in the know. And just incorporating that kind of feedback. (Annie’s SLP)

At school, a regular meeting with the counselor for school accountability [would help]. Somebody seeking an appointment out with her. (Grace’s SLP)
Subtheme 2. Connection with others is an important element of success.

Participants also brought up the personal and community connections that develop with communication. Different types of connections were discussed from personal interactions to community relationships. Dylan commented on his connection with classmates in high school when he said, “Not being included. Nobody goes, ‘Hey Dylan! Come here!’”

Dylan’s mother talked about the nonexistent relations between school personnel and her son:

That would be nice to have a [school] therapist who works with him longer than two hours a month. And they work with him two hours a month. They think they know him. And they don’t … the school therapist and the teachers.

Grace’s SLP commented on the struggling relationships between Grace and her teachers:

Her feeling overall for school is very poor. So I think some relationships with her teachers have been struggling. And so relationships with teachers [aren’t working out so well] and that plays into attendance and her confidence to initiate with teachers.

In contrast to the comments about negative or absent relationships between school and students, members of Dylan’s group and Annie’s group expressed that the community relationships the students were a part of the encouraging factors in their transition to school. It was clear from the comments that the school communities were active participants in the relationships versus unwilling targets of communication efforts.

[We’re like a family here.] We are. We really are. (Dylan’s middle school teacher)

She [Dylan’s middle school teachers] made all the kids feel special no matter if it was TBI or CP. They were her kids. Nobody was gonna mess with them. They were a family. There were all a family. Anybody needed help, somebody was always there. They helped each other out. (Dylan’s mother)
It was a very small community … They knew the mom well … They [school] were really engaged in helping her [Student 3] be successful because of the community. She was known. She was a known child which makes a difference. (Annie’s SLP)

Some participants commented on the value of social communication, indicating that interaction with others is a definition of success. When asked about what they thought were important elements of success for Annie and Dylan, their SLPs responded as follows:

[In the future she would be] playing with other kids. She was social. I would see her interacting with other little girls. I would hope. (Annie’s SLP)

I would love for him to initiate a conversation. And to have him remember things that aren’t just like really bizarre … like that’s the kid who tried to bring a bomb to school. Of course you’re gonna remember that. But what about your friends? I’m like, name a couple friends. And it’s like: oh … [Success in five years would be] when you walk in the door that he would not just be curious to know who’s there, but he would pursue it … My hope would be that he would come to the door and greet people, interact more spontaneously. (Dylan’s SLP)

**Knowledge and awareness.** The theme of knowledge and awareness was perhaps the most explicitly stated theme in the interviews. Participants generated many comments about the effect that the school’s awareness and understanding of TBI had on the services and support the students received. Parents and students, in particular, talked about being at a loss regarding how to facilitate success. They also talked about not having access to the knowledge they felt could be beneficial to them.

**Subtheme 1. School awareness and understanding of TBI.** Members from Dylan’s and Grace’s groups expressed frustration about the lack of knowledge school personnel had regarding the nature of TBI and associated interventions. Dylan’s mother shared her concerns about the safety of her son in light of the school’s lack of understanding of his specific deficits and needs:
[They don’t understand] his memory. Eating. Somebody gave him Skittles on the bus and they supposedly have no idea where they came from, but he ate some and nobody knew he had them. [They don’t understand] the therapies we’re doing at home … He’s not safe [at school].

More than safety, participants discussed concerns about students not receiving the services and support they needed because the school lacked adequate knowledge. Dylan’s mother contrasted Dylan’s high school teachers who showed limited awareness of TBI to his middle school teacher who demonstrated significant knowledge about TBI. She attributed much of what she perceived as inept teaching in the high school to the teachers’ inexperience with TBI and apparent unwillingness to learn:

They have never had somebody with this severe of a TBI. They’re older teachers. They do not want to learn. They do not want to change what they do to fit the students.

Grace’s mother relayed her frustration about the school not attending to her daughter’s TBI-related cognitive deficits, and later discussed how the school provided better services to her other daughter for a diagnosis about which the school appeared to have a more solid understanding:

It was like nothing was the problem. They more just were worried with her getting the wheel chair around and the crutches and all that … They weren’t really focusing on anything else.

I mean, it seemed a lot easier with my other daughter … She’s not a brain injury … She’s ADD, bipolar, and all that … But they set her up in special ed so she got them in every year. We were at the IEP meeting and everything. And I’m like, ok, what is the difference between a child who’s born this way basically and one that gets damage down the road? … With Grace it was like fine and all of the sudden there’s a problem. And I was like, ok, let’s just skip over it basically.

Grace’s SLP expressed similar concerns about the school’s lack of knowledge, stating that the school misinterpreted Grace’s TBI sequelae as behavioral problems. She reported “there wasn’t much knowledge about what they were seeing with the student
related to her brain injury” and continued to talk about this as a problem common in
many schools, which prevents students from getting qualified for the services that they
require:

There is a disconnect between therapists and school and how we view brain
injury. And I think that the kids suffer. And if there’s a way we could bridge that
gap. I think [private rehabilitation organization] has done a good job with having
speech therapists advocate for the students, but that only goes so far when the
culture of a school isn’t focused necessarily on the health system, the brain injury.
Because brain injury has resided mostly in the health care [setting] and the school
has had a hard time adjusting to that … I really think there should be a change in
that … I’ve got students in [different school districts] and it seems that all of the
school districts just have a real hard time qualifying kids and understanding what
that means. I’ve seen some shy away from it because of lack of knowledge. I had
a girl that came here to [private SLP clinic] and she’s probably 14. Her school just
didn’t qualify her, you know? And that’s so common. But they could do so much
better—the students could—if the schools understood what they were dealing
with and felt comfortable with it.

Other participants also recommended that teachers demonstrate understanding
specific to the needs of those with TBI in order to increase the likelihood of success for
students. Examples are illustrated in these comments:

Just that the teachers need to be open minded and be willing to learn about TBIs
and that not every TBI is the same. (Dylan’s mother)

Success would be that she [Student 3] was in a school environment where they
were educated enough about what the probable challenges would be as she
progressed and that they would support her with an IEP. (Annie’s SLP)

In situations that the participants felt positive about the student’s transition back
school, they clearly communicated that much of that was due to the school’s
understanding of TBI and awareness of the student’s situation related to the TBI. Parents,
SLPs, and the teacher all commented on knowledge and experience as critical elements to
facilitate a successful school reintegration. Dylan’s mother talked enthusiastically about
Dylan’s middle school teacher’s experience with TBI:
It helped that the [middle school teacher] had experience with TBIs. That was a big help. She knew about the short-term memory problems, the attention span, the gradually weaning him back into full days, the eating difficulties, therapies. It made it easier. It wasn’t a fight. He had somebody that understood him, who knew what he was going through.

Annie’s SLP pointed to the school personnel’s awareness of Annie’s TBI-related issues and indicated that it facilitated Annie’s success:

I think everybody felt like she needed to be in school although she was still delayed. But we felt like the school appreciated what her issues were … It was [supportive] and she really flourished.

Dylan’s middle school teacher commented on her own experience suggesting that it empowered her to provide appropriate support to him:

And I had quite an extensive background working with traumatic brain injured kids. I worked at [rehabilitation hospital]. I was a teacher there so I had a pretty good background with it. And so I kinda knew what to expect [Dylan] in a lot of ways. The impulsivity, the memory issues. Now that wasn’t really a surprise to me when he came in. So nothing surprises me about him.

**Subtheme 2. Access to knowledge for parents and students.** All of the parents and one student (Grace) talked at different points during their interviews about not having access to information that in some way seemed important to them, particularly Grace’s mother whose interview contained nine separate meaning units about this issue. A sense of helplessness was evident in their voices and comments, for some regarding obtaining the knowledge itself and for others regarding their inability to facilitate success without the knowledge. Grace appeared at a loss when I asked her about what she could do to improve her grades:

[little groan and shrug] I have no idea [what could make my grades better]. I don’t know [what I could do].

Dylan’s and Grace’s mothers were clearly frustrated as they talked about their access to information as they attempted to support their children:
It [back to school process] was difficult. We couldn’t get phone calls back. We didn’t know what program he was going into. Starting a new school district and not knowing where he was going to. It was quite interesting [said with sarcasm]. (Dylan’s mother)

I can’t do anything or can’t help her if I don’t know. [Several minutes later] Like I said, I don’t know how to help her really. [Several more minutes later] Like I said, I don’t know what I could do or how I could do. (Grace’s mother)

Dylan’s middle school teacher also commented on knowledge, but did so in a positive manner, advocating for providing students with the information they need in order that they might be successful.

And teaching them about the disability and what you need to be successful. And just drill it and drill it and drill it.

Services, support, and strategies. Participants talked more about services, support, and strategies than any other theme during the interviews, with many of the comments focusing on specific examples of interventions with which they had been somehow involved. In describing the different types of support, participants directly or indirectly referenced distinct service delivery models and approaches to intervention such as regular education immersion, consultative SLP role, and functional therapy. They also clearly referenced the appropriateness or “goodness of fit” of the services, highlighting the importance of integrating the previous two themes of communication and knowledge to provide relevant and individualized assistance. In related comments, the participants discussed the ease or difficulty with which support was obtained and how they went about seeking out that support. Finally, they made suggestions for roles and approaches that might benefit students.

Subtheme 1. Process of obtaining support. Along with mentioning the types of services and supports in which they were involved, most of the parents and professionals
and one student participant referenced the process by which services were obtained. They shared accounts of struggles to locate appropriate academic programs, identify positive learning environments, and connect the students with supportive educators. Words used to describe the overall back-to-school process included hectic (Annie’s father), fast (Grace’s mother), and difficult (Dylan’s mother). The participants often described collaboration and resources as low. They also conveyed the general impression that the process of obtaining support was cumbersome.

Members from all three groups indicated that the willingness of school personnel played a role in the process of obtaining services and support, but not all members had the same experiences in regards to the perceived efforts on behalf of the school community. Even within the same group, different experiences were described about the lengths school personnel would go. When asked what she thought others could do to make her classes work out better, Grace replied, “I have no idea. I’ve never had anybody try.” After generating a strategy of her own to do things without being rushed, she commented that her teachers don’t give her the flexibility to try it. Dylan described his school situation by saying, “Teachers are bullies and ignored my needs.” Other descriptions of school efforts include:

And she [Dylan’s middle school teacher] always fought for that [adaptive equipment]. She goes to a conference every year for technology down in Chicago and the school does not pay for it. She pays for it out of her own money. (Dylan’s mother)

It was a fight to get somebody from the high school down to the middle school to learn to feed him. It took us six months and the involvement of [upper management] … Everything’s been a fight. (Dylan’s mother)

And I want her to graduate. And I don’t know what I can do because it’s frustrating, especially when I know I can’t get the kind of help I need from the school to be able to do what I need to do. (Grace’s mother)
Cuz the school was fine with [private rehabilitation organization] being in there and doing it [therapy]. And then [school] OTs would follow up with [rehab OT]. (Annie’s father)

So I think the whole community was really—desired to help make this successful. (Annie’s SLP)

All three students had health care coverage based on Michigan’s no-fault insurance law, but members of Grace’s and Annie’s groups brought up a lack of funding by insurance as a factor that prevented the students from getting services. In both cases, the parents mentioned that after initial insurance denials, the adjustors did grant extended services (e.g., additional 6 weeks of therapy; in-home therapy only during the summer).

Grace’s mother had additional concerns about finances that she communicated as a source of frustration as she tried to support her daughter’s academic success.

I mean, we saw her [rehabilitation SLP] a couple of times and then insurance cancelled. Said she didn’t need it … They were like, “Oh, she’s fine,” cuz they were going by her grades before … The therapist wanted her to keep going, but the insurance was saying, “Oh well, she don’t need it cuz she got bad grades before.” I says, bad grades? What do you mean? She had Cs and Bs. I said now she’s getting Fs. To me that’s a big difference. I mean, yeah, she wasn’t doing great in school, but I mean, she’s not a dumb kid. (Grace’s mother)

Well, I had it lined up for [rehabilitation therapist] to go to the school and Annie would do her occupational therapy at the school and I don’t have to take her out. And that worked really well. Well, State Farm said … “And ok, well, we can’t do that. That’s duplication of services. Blah blah blah blah blah. Whatever.” So [rehabilitation therapist] can’t be [at school] and she wanted to do it after school at home. And then they said, “Well, we’re not gonna pay for it whether she does it at home or—cause it’s available at school, you need to do it at school.” So [Student 1] hasn’t been able to see [rehabilitation therapist] from January till she got out of school. (Annie’s father)

And I can’t keep forking out all this money to pay for [summer] school … I have to pay $125 for each class. [Several minutes later] I mean, but her dad’s struggling cuz he got a divorce and he’s struggling to raise her two brothers. And I’m on social security and we’re like, “Ok, we gotta pay how much?” I remember when summer school was free. (Grace’s mother)
Finally Grace was able to finally get on [the school’s online bulletin board]. I mean she kept trying and trying everything she could. Finally got us on it. And by that time the Internet was shut off because I couldn’t afford to pay the bill. (Grace’s mother)

Subtheme 2. Appropriateness of services to student with TBI. Regardless of the type of services that were provided through the school or how those services were obtained, members of all three groups indicated a sense of whether or not they perceived the intervention as “suitable” for the student. Dylan commented on what he judged to be instruction that was not at his level: “They don’t challenge my brain.” Grace’s mother questioned the school’s decision to let her daughter pass the 8th grade saying, “They just let her pass … but is that really going to help her any?” Dylan’s mother and Annie’s father both talked about intervention decisions the school made which they did not deem appropriate to their children’s needs. In addition to an indication of disapproval of specific interventions, Dylan’s mother made it clear that a “one size fits all” approach is not desirable:

[IEPs are] like pulling teeth. They want one set standard for every kid no matter what their disability is, no matter what they need. [They say] this is what he’s going to do … And I have to argue that he cannot do that; his memory won’t allow it. There’s no way he can do a four-step math problem without a calculator. No way he’s going to be able to memorize his whole timetables. And why would you need that in the real world when most people have a calculator right on their cell phone? But then on the other hand they want him to have a job by his junior year. It isn’t gonna work … It’s almost like to a certain extent the IEPs and METs and the paperwork we have to fill out—almost like it’s setting him up to fail because they have to score a certain score on these tests. And what general ed kid knows how to prepare a three course meal so why would these kids?

Dylan’s middle school teacher’s descriptions of the interventions they tried with Dylan appear to fulfill his mother’s desire for an approach other than a “one set standard for every kid”:

He was a huge soccer player so we taught him to play soccer in the wheelchair.
And he was so happy to be able to not have to read kiddy books. He was one of the first ones to start listening to Harry Potter and stuff like that.

He’s not going to be a high school diploma kid. And so we—it’s a general ed curriculum, but it’s modified to what his need was.

But he came in to talk about the fossils. It was so cool. So he’s kinda living his paleontology dream through coming to these schools and talking about paleontology and fossils.

Dylan’s SLP also made it clear that she considered what would be beneficial and fitting to Dylan’s situation as she was making her intervention decisions:

Since I changed my schedule, [Dylan’s mother] wanted me to stay on with Dylan and so I had to ask [private rehabilitation organization] if I could do two hours once a week. But I did ask them, “Is that the most therapeutically beneficial for Dylan?”

And maybe that’s [social interaction] just something that I value. And then, am I putting that on him?

**Subtheme 3. Recommendations for interventions and approaches.** Many of the suggestions for support reflected the theme of appropriateness as described above, stressing individualized services. Students, parents, and SLPs that represented each group recommended strategies that were specific to each student’s situation. These strategies included no more bullying (Dylan), focusing on one class at a time (Grace’s mother, Grace’s SLP), having someone to be accountable to (Grace’s SLP), doing things on my own time and something to keep my attention (Grace), teachers that are energetic (Grace’s mother, Grace), and keep giving her those little things like the tilted desk (Annie’s father). Others provided recommendations to take the students’ needs and desires into consideration when planning intervention. For example, Annie’s father suggested that the school should stay aware of what his daughter needs and Dylan’s
mother wanted people to “Listen to [Dylan].” The SLPs from Dylan’s and Grace’s
groups similarly commented:

So I think just trying to find out, just being more sensitive to what he wants. He’s
a young adult. And so, finding out what his likes and dislikes are. And not just
talking about likes and dislikes at school, but really then pursuing those things.
(Dylan’s SLP)

I’d kinda take that approach of observation and discussion with her. I’d want to
know what’s been going on since I last saw her. What’s been working in school?
What hasn’t been? Did she even pass her summer school? Does she have the same
goals? Maybe she has a different thought on where she wants to be in a year.
Maybe she doesn’t even care if she passes her classes or care if she goes. So I’d
look at that. (Grace’s SLP)

Dylan’s mother’s comment mirrored the idea of seeing the unique needs of students with
different disabilities:

Teachers … that are open minded to the different disabilities coming into their
classroom [would make it better]. These kids do not fit one program so you
cannot force them to all fit into one program … Somebody that taught the kids.
Each child needs to be taught, not trying to push them all into one program.

For situations in which members of the group were dissatisfied with the
intervention that was being provided, participants were quick to offer suggestions to
change the system and get new staff, including Dylan who said, “Fire the teachers. I
would fire the teachers.” Similar comments included:

I’d like to change the whole system! I mean for kids like her … She’s falling
through the hole in the middle. And it’s not fair. (Grace’s mother)

[To make Dylan successful it would take] upper management to get some
kahunas! [laughter] No, basically the staffing. If they got younger teachers in
there who were open minded, who were technology-wise, it would help big time.
(Dylan’s mother)

**Student attributes and circumstances.** Members of all three groups talked a
substantial amount about student attributes and circumstances. Many descriptions were
provided of the students’ strengths and needs, particularly related to cognitive-
Subtheme 1. Current successes. When participants talked about successes or “things that were working out well” at the time of the interview, they were often comparing the current situation to how things were shortly after the accident. Annie’s father commented multiple times about the improvements he has noted in his daughter’s cognitive skills since starting rehabilitation, including memory and math gains, improved judgments about friendships, and story skill development. Grace and her mother expressed satisfaction with Grace’s progression back to near pre-morbid math skills. Dylan’s SLP talked about relative strengths she saw in Dylan that were undoubtedly lower than his abilities prior to his TBI. Members of Annie’s group were the only participants to suggest that the student’s overall current situation was successful. In general, their comments indicated gratification with the transition back to school, including the school’s response to Annie’s situation, the services provided by school and rehabilitation therapists, and Annie’s academic performance. Annie’s father remarked at the end of the interview that “She’s doing great.” When asked about success for his daughter, he stated that he wanted her to be with the regular education students doing what they are doing; this was, in fact, his daughter’s current situation.

Subtheme 2. Current struggles. Some participant responses to interview questions about aspects of life that were not particularly successful were broad and often emotional statements related to the students’ present circumstances. For example, Dylan...
indicated that “everything” had changed since his TBI and Grace said, “Almost everything [isn’t working out so well] … Basically all of it.” Grace’s SLP sympathized with Grace’s situation saying, “She’s an island out there.” Dylan’s mother commented in a tone that was perceived as sarcastic that life has been “interesting” since her son’s TBI. Before describing her specific frustrations about Dylan’s current situation, she emphatically answered “high school” to my prompt to talk about things that were not working out well. Grace’s mother, who provided detailed descriptions of their struggles, also commented more generally:

Right now, with as many roadblocks as I’ve hit … I feel like nothing [is working out well for her at school].

Other participant responses were specific. Members of all of the groups provided details about what they perceived to be areas of difficulty, including comments about school, emotional health, and social issues, as well as possible links between these areas. Comments from students and their parents that centered on the students’ characteristics typically compared the students’ current skills to what they were able to do prior to their TBIs. Descriptions of areas of need included it’s harder for people to understand me (Dylan), school’s a little harder now (Grace), she’s got depression now (Grace’s mother), and learning new stuff … just takes her a little longer (Annie’s father). Grace’s mother expressed with frustration:

[In the 4th grade] we were trying to get her in special ed for English … And all she needed was English. She didn’t need [help in] any of the other classes. And then she had the accident and everything else went out the window.

The SLPs and teacher commented more specifically about cognitive communication skills versus comparing pre- and post-morbid skills, as would be
expected given their professional roles and the fact that they did not know the
students prior to the accidents.

Just his self awareness, I think. His awareness of others and personal space.
(Dylan’s SLP)

She still had some physical challenges that the kids probably could notice, but I
don’t necessarily think the kids would have noticed her cognitive-linguistic
challenges. (Annie’s SLP)

And the reasoning. Try to do those multi-step things. It’s just, I think that
language center with all that and the memory center just got hit so hard. (Dylan’s
middle school teacher)

Not all of the professionals, however, appeared to focus exclusively on the
students’ cognitive-communication weaknesses as barriers. This can be seen in the way
Grace’s SLP and Dylan’s middle school teacher framed their comments about cognitive
deficits in a more positive discussion about creative problem solving and strategy use.
They clearly indicated that student needs existed, but they talked about those needs in the
context of how they addressed them.

We bought a planner. The planner was helpful. Now she did need reminders for
planner use, but to see it—those written reminders were helpful to her. She
needed cues from teachers and counselors … It helped her follow through in her
planning, her predicting of what was to come. Her prospective memory obviously.
(Grace’s SLP)

So you know, he needed to feel like he wasn’t dumb. That even though he
couldn’t remember things and do things physically, that there was stuff [he could
do]. (Dylan’s middle school teacher)

All participants addressed academic struggles in some manner. The students
talked about certain aspects of school that they found difficult such as the rest of the
classes are really hard (Grace), adding and subtractions are a little bit hard for me
(Annie), and the teachers are just plain bullies (Dylan). Members of Grace’s and Annie’s
groups mentioned grades and classroom performance as areas of struggle. With the
exception of Dylan’s middle school teacher, members of Dylan’s group did not make any reference to his academic abilities or performance. Their comments about academic struggles focused on the academic environment versus the student’s performance.

There’s a lot of on-your-own activities. It’s a little harder to, you know, keep up with everybody else. (Grace)

[When] she started kindergarten she was ahead of everyone because she was mostly the way through kindergarten stuff with her mom as preschool. So then we start first grade about equal with everyone. And they’re learning faster so at the end of the year she’s behind. (Annie’s father)

Because she’s failed so many classes that she won’t graduate already. And it’s only the ninth grade. (Grace’s mother)

[Said in an angry voice] They do not teach science. They do not teach history. They are not allowed to teach English because supposedly these things are not needed in the real world. I mean, they are not even allowed to teach punctuation. (Dylan’s mother)

**Subtheme 3. Future hopes and concerns.** While explicitly discussing success, all three parents indicated that they desired happiness, contentment, and survival for their children as voiced through their worries and hopes about their children’s futures. Annie’s father shared his concerns about his daughter getting the support she needs and not knowing how her brain will “wire” as she gets older. Grace’s mother expressed fear about problems down the road:

She’s gonna be one of these kids that end up out there that’s gonna be walking the streets because they don’t have no education, they have no income, no way to survive. And that’s what scares me … I’m always worried about that. (Grace’s mother)

Various pathways to reach success were described by the parents. For Grace’s mother and Annie’s father, it was related to academic success that would lead to future opportunities. For Dylan’s mother it involved Dylan being in a school environment where people would listen to him.
[Success for Grace means] basically, for her to be able to graduate, to go to college, to do what she wants to do … To be successful, have a job, get a house. But she needs that education. She needs that diploma. She needs that college degree. And I mean, it’s gonna be a struggle now, but I still want her to be able to do it. (Grace’s mother)

I want her to be able to do what the other kids are doing … I want her to be in a regular class with all her friends. And if they’re doing math, she’s doing math. You don’t have to be a straight A student, but I don’t want you just barely getting by and struggling the rest of your life. Which I guess, 1st, 2nd, and 3rd [grades] is the foundation you need to get good math and everything … I would be perfectly happy if she was an average kid and got all Cs and was right in the middle with everybody else. If she can just be average, that’s a huge—When you think about back to [rehabilitation hospital] when she couldn’t sit up and couldn’t talk. Cuz there was—the first night we weren’t sure she was even gonna make it. So, you go from that to being an average kindergartner. (Annie’s father)

[Success at school would mean] he’s happy. He wants to go back. He looks forward to it; now he doesn’t … [Success is] his well-being. His well-being. (Dylan’s mother)

Grace stressed grades as an indicator of success and a key aspect to accessing future opportunities. Dylan suggested that he, too, cared about grades, but also indicated that he wanted recognition as a unique individual saying, “I’m a actual person.” Annie, the youngest of the three students, talked about wanting to feel proud about learning.

Because keeping the grades up is important cuz if you don’t have good grades you don’t have basically a future because you won’t graduate. So it’s basically—grades kinda hold a lot … Get good grades [means I am successful at school]. Have a great GPA. Have a high grade point average. Basically, you know, being able to graduate on time. (Grace)

Getting good grades cuz I think my teachers are giving me Es. For one, stop changing my grades. (Dylan)

[I hope that I feel proud about doing] learning. [I hope that I do really good at learning about] animals. (Annie)

The definitions of success that the SLPs and teacher expressed were consistent with the general goals that the parents of their respective units described. Dylan’s SLP and middle school teacher focused on being successful in non-academic ways, such as
connecting socially with others (Dylan’s SLP) and living his dreams in a different way (Dylan’s middle school teacher). Grace’s SLP identified success for Grace as whatever Grace herself defined as success, which in this case was getting good grades. Annie’s SLP described success for Annie as being in a supportive learning environment. Perhaps the most encompassing definition of success and hope for this success was voiced by Dylan’s teacher as she stressed multiple times throughout her interview that students always have something to give and that it is the job of educators to develop creative ways to facilitate the students’ contributions to their communities.

Discussion

The purpose of this study was to gain additional understanding about success following TBI. More specifically, it was designed to qualitatively explore perspectives of children and adolescents with TBI, their parents, and professionals who provided rehabilitation and/or transition services. Semi-structured interviews were used to seek participant insights about their experiences with the transition back to school, particularly about their definitions of success, and factors that might facilitate or hinder that success. As participants talked about their experiences, four main themes emerged: communication and connection; knowledge and awareness; services, support, and strategies; and student attributes and circumstances. The interview data that comprised the content of the themes addressed issues such as the critical role that relationships between school personnel, students, and families play in obtaining support; the empowering nature of knowledge for both schools and families; the complex process of establishing and maintaining student-centered services; and the emotional and changing nature of what success means to different people.
Communication was clearly identified by participants as a critical element of obtaining support necessary to facilitate success. The descriptions of communication breakdown in this study, particularly between home and school, and the desire of the parents and students for schools to partner with them are addressed by other studies that describe the nature of educator responses and the importance of collaboration between parents and teachers. For example, Mealings and Douglas (2010) discussed the theme of support that emerged from their interview data. Students in their study spoke openly about the importance of having positive relationships with their teachers. In their interviews with parents of children with TBI, Roscigno and Swanson (2011) reported parents’ struggles to obtain support when teachers were perceived as “gatekeepers.” On the other hand, they described successes when parents perceived supportive teachers who were willing to work with them.

The insights gained from the current study, however, also include the importance of the existence of any communication at all. Parents who were dissatisfied with their child’s current school situation expressed frustration about the lack of communication efforts on the part of the school. Sharp and her colleagues (2006) reported a similar finding as several of their participants talked about lack of availability of teachers and one mentioned difficulty getting in touch with a certain teacher. A testament to the effectiveness of regular contact was heard from members of Annie’s group in the current study. They felt pleased with the school’s response, and pointed out that a key factor in Annie’s successful transition to school was the fact that communication exchanges occurred regularly between all parties involved.
In addition to the existence or absence of communication, participants in this study also commented on the nature of their interactions with school personnel. The way in which school personnel responded to students and parents appeared to be connected to the school personnel’s knowledge of TBI. The participants that described positive interactions with school personnel also indicated that the school demonstrated awareness of the impact of TBI on a student’s functioning and knowledge of interventions that could support that change in function. In contrast, when participants felt poorly about their interactions with school personnel, they also indicated significant frustration with those educators’ lack of understanding of TBI and appropriate supports. Sharp and colleagues (2006) reported similar findings in that the families perceived a great misunderstanding and lack of awareness on the part of teachers of the deficits associated with TBI. In fact, the level of educator knowledge was linked to whether participants judged the transition to school as a success. Mealings and Douglas (2010) also discussed this issue as their adolescent participants indicated that they felt their school supports were successful when the teachers or aides understood them.

Another aspect of knowledge discussed by the participants in this study was the information to which the parents and students had access. Many felt that the school was not divulging information that the parents deemed necessary to be able to support their children. This frustration has at its heart a combination of communication and knowledge. The school’s dissemination of knowledge and engagement with families appears related to the school personnel’s own awareness of TBI. This notion is supported by other studies that reported that educators who have little knowledge about TBI are less likely to be available or provide services (McGrane & Cascella, 2000; Sharp et al., 2006).
The interactions between school personnel and parents also suggest the need to explore how the socio-cultural and socio-economic contexts of the school community have influenced the school’s responsiveness to parents.

This emphasis on knowledge of TBI is not new. The literature provides many examples of studies that show that school personnel lack the knowledge necessary to provide services that are considered best practice in supporting students with TBI. This can be seen in the work of Mohr and Bullock (2005) who—after conducting focus groups with educators—questioned whether enough teachers are receiving information about TBI that is necessary to support students. Studies such as one by Leith, Phillips, and Sample (2004) that have interviewed families of students with TBI, also show that family members perceive a lack of knowledge about TBI on the part of many of the people they interacted with during their family member’s rehabilitation, particularly in the school setting. Their results are consistent with the findings of this study in that many participants expressed frustration about the perceived lack of knowledge and experience of school personnel.

In the current study, Grace, her mother, and her SLP expressed dissatisfaction about the transition back to school even though the SLP was a rehabilitation specialist knowledgeable about TBI and engaged with school personnel. Despite their experienced and collaborative SLP, Grace’s group perceived her school situation as unsuccessful. Although the link between rehabilitation specialist and school is related to the provision of formal school supports (Glang et al., 2008), the powerful influence of the school culture suggests that it requires more than a knowledgeable SLP (or other rehabilitation specialist) to facilitate a successful school experience. Results from the current study
showed that knowledgeable communication (e.g., paying attention to student difficulties, seeking parent input about intervention decisions) on the part of the school lead to a more positive experience with the process of obtaining fitting interventions. It was clear from participants that if knowledge and communication were missing, establishing and maintaining appropriate school support was a frustrating and cumbersome experience. These findings stress the need for school personnel to be well educated or willing to learn about TBI and best practice intervention models, which is a position supported by other research (Adams & Adams, 2008; Blosser & DePompei, 1991; Glang et al., 2004; Glang et al., 2008; Rodset, 2008; Roscigno, Swanson, Vavilala, et al., 2011; Sharp et al., 2006).

Members of the three groups in this study had identified strategies and supports that they felt were needed for the students to achieve success. All services identified were specific to the individual student versus generic solutions or standardized programs. For example, Grace identified doing things on her own time and not being rushed as things that she felt were helpful, which were similar to wishes expressed by adolescents in the mixed methods study by Renstrom and colleagues (2013). The members of Dylan’s unit identified specific educational supports and programs that they felt were appropriate to Dylan’s needs. Annie’s father and SLP talked about trying the little things that they felt were helpful such as accommodations, therapist support, and outside tutoring. From their descriptions, it is evident that knowledge and communication are not only related to the process of obtaining services but also to the actual services that result from the process. In the situations in which participants felt they did not receive support that they had identified would be helpful, they also described school situations in which there was
communication breakdown and inadequate TBI knowledge. In the situations in which participants did feel they received the support they wanted or needed, they described teachers who knew about TBI, who were willing to try different things, and incorporated their feedback into service provision.

The process of obtaining support might be frustrating because of lack of communication and knowledge in and of itself, but the complexity of these situations also stems from the strong desires for positive outcomes. The definitions of success provided by participants in this study varied from specific descriptions from parents, less-detailed ideas from students, and supportive statements from professionals. Roscigno, Swanson, Vavilala, and Solchany (2011) also noted less detailed comments from the children in their studies, particularly younger ones and those who had more severe injuries. This is consistent with the findings of the current study in that the youngest student (Annie, 7 years old) talked about wanting to be good at learning, particularly about animals. The student with the most severe TBI (Dylan) indicated he wanted to be seen as an “actual person,” for school to be more fun, and good grades to replace the “Es” he believed his teachers were giving him. Grace, who was in high school and had relative cognitive-communication strengths, talked specifically about a desire to achieve the grades necessary to graduate, which she hoped would lead to future opportunities.

Even though their comments about success were not all detailed or realistic, the student participants in this study still provided valuable insight into what students perceive as important. Their comments implied similar components to success that were identified by Mealings and Douglas (2010) from the adolescents in their study: the
importance of participating in “getting an education,” being able to work towards future vocational goals, and having an enjoyable school experience.

When incorporating all of the participants’ comments about success, an overall definition can be characterized by a desire for survival and well-being. The members of Grace’s and Annie’s group associated that well-being with being able to do what peers are doing, implying more traditional elements of success such as getting good grades, having a job, and supporting oneself. The criterion of participating in the same activities as peers reflects the nature of participation scales such as the CASP (Bedell, 2004) and CAPE (King et al., 2004), suggesting that those measurement scales might indeed capture a part of what is important to families. Bedell and colleagues’ (2005) interviews with parents also indicated that parents deemed it important for their children to be able to participate in age-appropriate activities at levels similar to peers. For Dylan’s group, in which the student was the farthest post TBI (7.5 years) and had the most significant functional limitations, the elements of success that the participants discussed were less focused on what the student was participating in, and more on how he was experiencing the activities. Participation was an aspect of Dylan’s group’s definition of success, but his positive experiences would likely not have been captured by a participation scale that compared Dylan’s level or frequency of participation to that of his peers.

Strengths and Limitations

A strength of the current study is its inclusion of multiple perspectives on a phenomenon that is difficult to define: success. Particularly important is this study’s incorporation of the input of the children and adolescents who have TBI. To strengthen this study further, additional students of multiple ages and stages of recovery could be
interviewed, allowing for a more thorough exploration of their perspectives. Another area for this study’s expansion would be to include the voices of additional educators; hearing from school personnel in a range of educational situations would provide another layer of understanding to the complex process of return to school following TBI. In addition to the need to provide more student voices and the perspectives of school personnel, limitations of this study include the fact that all 10 participants except one were white and, although suburban and rural areas were represented, all participants were from a 60-mile radius in Michigan. In light of this limited diversity, the findings may not be as relevant to students, families, and professionals with different demographic profiles. A more diverse group of participants would strengthen this study and contribute a richer understanding of the transition-to-school experience, particularly as it relates to the socially and culturally constructed nature of success.

**Conclusion**

In this study, participants talked about successful transitions to school in terms of the support they felt they received or had not received from school personnel. Indications from students and families of a supportive environment include being heard and having their feedback incorporated into intervention decisions. The interaction between open communication and TBI knowledge appear to be critical elements of positive experiences. No clear definition of success emerged from the research findings, although components of success included participation in activities similar to peer participation and overall well-being. The fact that an all-encompassing definition of success was not identified suggests that having a predetermined measure of success ignores the changing nature of life after TBI, the subsequent possibilities that surface along the way, and the
unique profiles of the students involved. Keeping aware that participation is one aspect of success, students, families, and professionals might define success together by engaging in an ongoing conversation about what is important to each individual student and family. At the research level, using multiple sources of information as outcome measures (e.g., participation scales, questionnaires, interviews) as seen in the work of Souza and colleagues (2007), would likely capture a truer assessment of success than a preset measurement scale alone could.

Clearly, the transition to school following TBI can be a stressful and emotional experience for students and their families. The process of obtaining appropriate educational services can be supported by knowledgeable communication between school, home, and rehabilitation professionals. The SLP role that would best facilitate such a situation would seem to be that of collaborative consultation; however, the results of this study suggest that is not always enough. Despite best efforts of some SLPs to facilitate knowledgeable communication, a school culture characterized by unwillingness or unawareness might still be a barrier to a school experience perceived as successful. This stresses the need for education about TBI to happen consistently and early in order that educators might be prepared when they encounter students with TBI. Even if educators are not experts in TBI, but have sufficient exposure to be aware that their students with TBI have complex needs, they might be empowered to contribute to and support students’ transitions to school in meaningful ways.

References


CHAPTER V

IMPLICATIONS OF STUDIES ON SCHOOL REINTEGRATION FOLLOWING TRAUMATIC BRAIN INJURY

This three-paper dissertation focused on aspects of school reintegration following pediatric traumatic brain injury (TBI). Through quantitative and qualitative methods, the studies explored common themes of best practice, training, and supporting successful reintegration.

Study 1 involved a survey of SLPs in Michigan to gather information about their practices with students with TBI, demographic factors that might be associated with their practices, and possible reasons for not using certain practices. The aim of study 1 was to provide initial answers to questions regarding SLP practices and their alignment with recommendations in the literature.

Study 2 sought to evaluate the effectiveness of interprofessional educational activities to prepare students in speech-language pathology and special education (SPED) to provide improved services to meet the unique needs of children with TBI in elementary schools. This study used a partially randomized controlled design to compare two educational approaches for graduate students in speech-language pathology to work collaboratively with teachers to address the needs of students with TBI.

Study 3 focused on obtaining multiple perspectives about academic reintegration through semi-structured interviews with adolescents with TBI, their parents, teachers, and SLPs. A phenomenological approach was used to answer questions about how various people involved in a child or adolescent’s recovery after TBI (including the child or
adolescent) define successful school reintegration, and what factors hinder or facilitate that success.

**Implications for Practice**

The findings from the three studies highlight the complexity of school reintegration following TBI, both for students with TBI and for those supporting the students. Research indicates that school-age children and adolescents with TBI require ongoing support for academic and social success using methods that are contextualized and collaborative (DePompei, Epps, Savage, Blosser, & Catelli, 1998; Taylor et al., 2003). The literature also reveals that preservice and professional educators hold misconceptions about TBI that might negatively impact their intervention decisions (Evans, Hux, Chleboun, Goeken, & Deuel-Schram, 2009; Farmer & Johnson-Gerard, 1997; Hux, Bush, Evans, & Simanek, 2013). In addition, studies have shown that families of students with TBI perceive a lack of knowledge and collaboration on the part of the professionals involved in the transition back to school (Roscigno & Swanson, 2011; Sharp, Bye, Llewellyn, & Cusick, 2006).

Collectively, the three dissertation studies supported these findings from prior research with regard to gaps in knowledge and experience of professional and preservice SLPs and preservice educators, as well as the negative perceptions of students with TBI and their families. Study 1 indicated that SLPs in school settings had limited numbers of students with TBI on their caseloads. Despite this finding, however, results also showed that nearly all (98.6%) of the SLPs surveyed reported using at least one contextualized practice. This is important because contextualized service delivery is supported by a relatively large body of literature as best practice (e.g., ASHA, 2003; Feeney &
Ylvisaker, 2003, 2008; Savage, DePompei, Tyler, & Lash, 2005). Another promising finding was the level of knowledge about TBI that could be expressed by the preservice SLP students in study 2. On the other hand, the SPED students in study 2 showed significantly less knowledge of TBI and would not have had specific educational experiences related to the topic had they not participated in the interprofessional training. Knowledge of school personnel regarding TBI also was addressed in the qualitative interviews in study 3. Participants in this study (both parents and professionals) spoke strongly about their perceptions that school personnel lacked the TBI knowledge necessary to support students with TBI. They also indicated the importance of collaboration among teachers, parents, and rehabilitation specialists in the transition back to school following TBI. Perhaps more training of the type used in study 2 would prepare SLPs and educators to work collaboratively with each other and with families.

This dissertation emphasizes the need for adequate TBI training and experience in order that SLPs and teachers might be prepared to provide appropriate services for their students with TBI. Some experts suggest that appropriate services should incorporate functional, personally-relevant activities that integrate multiple skills and rely on collaborative efforts among the professionals and family members who play an active role in a student’s life (ASHA, 2003; Braga, Da Paz, & Ylvisaker, 2005; Savage et al., 2005; Ylvisaker & Feeney, 2009). Many participants in study 3 communicated significant frustration about the lack of knowledgeable communication on the part of school personnel. Study 2 indicates the need for further research into the preparation of teachers who might enter the workforce without having adequate TBI learning opportunities. The SLPs surveyed in study 1 who worked in a school setting reported using more
contextualized practices than those in other settings. This suggests that a school setting may be more conducive to using some contextualized practices such as curriculum-based tasks and consultation with teachers. It also presents encouraging data that collaborative SLPs in the school setting could work with teachers and other educators to potentially increase the knowledge of school personnel and thus better equip them for working with students with TBI.

Prior research indicates that the link between hospital and school is another vital component in the transition back to school following TBI (Glang, Todis, Thomas, Bedell, & Cockrell, 2008), but study 3 suggests that this may not be enough. The culture of the school appears to have a powerful influence on how students and their families perceive the success of school experiences. Despite best efforts by some SLPs to facilitate knowledgeable communication, a school culture characterized by unawareness might still be a barrier to a positive and supportive school experience. This reiterates the importance of sufficient training—perhaps at both preservice and professional levels—to prepare all educators for working with students with TBI and their families.

**Implications for Future Research**

The preliminary findings of the individual studies in this dissertation lead to further research questions. The findings of study 1 provided information about whether SLPs used specific interventions related to contextualized practice. This work could be expanded by further probing to discover how SLPs are using those contextualized practices in terms of frequency, timing, and quality of use. Study 2 added to the limited research on interprofessional education (IPE) in non-medical settings, which could be explored further with a more in-depth measurement of collaboration and additional
control groups. Qualitative investigation of the participants’ perceptions of the training could provide insight for revising future trainings. The results of study 3 suggested that the school culture has a powerful influence on how students and their families perceive the success of the school transition. Hearing from school personnel in a range of educational settings would provide another layer of understanding to the complex process of return to school. This understanding would hopefully lead to concrete ideas for implementing change.

**Limitations Across the Three Studies**

Limitations exist in this series of dissertation studies. First, the participants in all three studies were from Michigan, limiting the generalizability of the findings. Study 1’s convenience sample could be expanded in future surveys to include SLPs from a national database. Adding a control group for the SPED students and recruiting other universities to participate in future trainings could increase the robustness of study 2. Since study 3 was a qualitative study, random sampling was not appropriate; however, a more diverse group of participants would add a richer understanding of the school transition experience. In addition to a limited range of participants, another limitation includes the use of researcher-created measures: study 1’s survey and study 2’s learning assessments. Although these measures were used, a panel of nationally recognized experts validated portions of the survey content, and study 2 also incorporated a previously researched self-rating scale.

**Conclusions**

This series of three dissertation studies focused on aspects of school reintegration following pediatric TBI. Specifically, common themes of best practice, training, and
supporting successful reintegration were explored. Findings suggested that, although many school-based SLPs have few students with TBI on their caseloads, many of these SLPs provide contextualized services that are supported by experts in the field. Insights were also gained about factors that might prevent SLPs from providing contextualized services. Findings from these studies suggest that increased education and training is needed to provide SLPs and teachers (both general and special) with the knowledge necessary to determine what interventions will best meet the unique needs of their students with TBI and support their success. The interprofessional training conducted as part of this dissertation research addressed the preparation of SLPs and educators. This training module has the potential to address education needs in the context of collaborative learning while also expanding opportunities for IPE outside of the health care setting. Finally, important insights about success were gained through qualitative interviews with students with TBI, their families, and clinical and educational professionals. An all-encompassing definition of success did not clearly emerge from the research; however, themes of communication, knowledge, and support suggest that students, families, and professionals might facilitate success together by engaging in ongoing conversations about the unique needs of each student. This dissertation work provides insight into the complex process of return to school following TBI. It offers hope that education and knowledge could help to equip professionals and families to support students with TBI as they attempt to identify and achieve success.

References


Appendix A

Human Subjects Institutional Review Board
Letters of Approval
Date: March 7, 2013

To: Nickola Nelson, Principal Investigator
Heather Koole, Student Investigator for dissertation

From: Amy Naugle, Ph.D., Chair

Re: HSIRB Project Number 13-03-07

This letter will serve as confirmation that your research project titled “Practices of Speech-Language Pathologists with Students Who Have Traumatic Brain Injuries” has been approved under the exempt category of review by the Human Subjects Institutional Review Board. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the application.

Please note: This research may only be conducted exactly in the form it was approved. You must seek specific board approval for any changes in this project (e.g., you must request a post approval change to enroll subjects beyond the number stated in your application under “Number of subjects you want to complete the study”). Failure to obtain approval for changes will result in a protocol deviation. In addition, if there are any unanticipated adverse reactions or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the HSIRB for consultation.

Reapproval of the project is required if it extends beyond the termination date stated below.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: March 7, 2014
Date: March 7, 2013

To: Nickola Nelson, Principal Investigator
    Heather Koole, Student Investigator for dissertation
    Judy Vander Woude, Co-Principal Investigator

From: Amy Naugle, Ph.D., Chair

Re: HSIRB Project Number 12-10-14

This letter will serve as confirmation that the change to your research project titled “Preparing Professionals to Work with Students with Traumatic Brain Injury in Educational Settings” requested in your memo received February 25, 2013 (add additional oral consent process for this data collection) has been approved by the Human Subjects Institutional Review Board.

The conditions and the duration of this approval are specified in the Policies of Western Michigan University.

Please note that you may only conduct this research exactly in the form it was approved. You must seek specific board approval for any changes in this project. You must also seek reapproval if the project extends beyond the termination date noted below. In addition if there are any unanticipated adverse reactions or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the HSIRB for consultation.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: October 16, 2013
Date: April 4, 2013

To: Nickola Nelson, Principal Investigator
   Heather Koole, Student Investigator for dissertation

From: Amy Naugle, Ph.D., Chair

Re: HSIRB Project Number 13-03-08

This letter will serve as confirmation that your research project titled “First Person
Definitions of Successful School Reintegration for Students with Traumatic Brain Injury”
has been approved under the expedited category of review by the Human Subjects
Institutional Review Board. The conditions and duration of this approval are specified in
the Policies of Western Michigan University. You may now begin to implement the
research as described in the application.

Please note: This research may only be conducted exactly in the form it was approved.
You must seek specific board approval for any changes in this project (e.g., you must
request a post approval change to enroll subjects beyond the number stated in your
application under “Number of subjects you want to complete the study”). Failure to
obtain approval for changes will result in a protocol deviation. In addition, if there are
any unanticipated adverse reactions or unanticipated events associated with the conduct
of this research, you should immediately suspend the project and contact the Chair of the
HSIRB for consultation.

Reapproval of the project is required if it extends beyond the termination date
stated below.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: April 4, 2014
Appendix B

Role Play Information Sheets
Role Play Information Sheets

General Education Teacher Role

You are not quite sure how you are going to be able to manage this new student, Bill, in your classroom. After all, he is one of 26 students and there are several students who have unique challenges. Though you feel somewhat overwhelmed, Bill might just push to the edge ...

Bill is new to your school and you haven’t had time to read his file – who could? He appears to not know what is going on in the classroom or on the playground. He typically is doing something other than what you have told the class to do. The new speech pathologist and the veteran resource teacher (special educator) have made an appointment to meet with you to talk about him. The only time they could meet is during your break time, which is a bit annoying. They’d better be able to help.

<table>
<thead>
<tr>
<th>Student Profile: Bill</th>
<th>Age: 11</th>
<th>Grade: 5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WHAT YOU SEE</strong></td>
<td><strong>WHAT YOU THINK: is this a problem? Why or why not? What will you do with this? How does it affect you and/or your students?</strong></td>
<td></td>
</tr>
<tr>
<td>He isn’t able to keep up with the class</td>
<td></td>
<td></td>
</tr>
<tr>
<td>He is slow with everything he does</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Talks to kids around him when the teacher is talking; doesn’t seem to learn from repeated requests to stop talking out of turn;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does math calculations quite well, but doesn’t want to follow directions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cannot keep up with note taking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>His writing is limited in quantity and his word choice is simplistic and repetitive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doesn’t recall much from what he reads</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doesn’t hand in assignments</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Expert Consultant Role

You two specialists are going to consult with a classroom teacher regarding a Bill, a student who experienced a brain injury that resulted in a cognitive impairment, particularly seen in memory, attention, and processing speed. Dr. Schoo L. Psych has suggested that Bill is eligible to receive special education service under the educational label of traumatic brain injury or cognitive impairment, with a secondary label of speech and language impaired.

Your goal is to help Bill’s teacher include Bill in the general education classroom for as much time as is practical and is beneficial for Bill and for his peers. Recognize that Bill’s teacher is quite uptight about meeting Bill’s needs in his/her classroom.

In order to be prepared for this consulting experience, you have read the student’s entire cumulative file, which you can be comfortable concluding that his classroom teacher has not done. You reviewed thoroughly the curriculum used in his class. As part of your preparation, to help Bill’s teacher, you prepared specific suggestions for his teacher, plus you brought an article for her to read about brain injury, language processing, and cognitive impairment.

**Student Profile: Bill**

| Age: 11 | Grade: 5 |

<table>
<thead>
<tr>
<th>DATA</th>
<th>Speech and Language Pathologist Recommendations</th>
<th>Education Specialist Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below Average Cognitive Function (IQ: 68; VIQ: 61; PIQ: 90)</td>
<td>Preview vocabulary by reading, rehearsing, and defining before reading tasks/activity;</td>
<td>Draw pictures in place of or in addition to words;</td>
</tr>
<tr>
<td>Received services for students with language impairment</td>
<td>Monitor and adapt vocabulary complexity in reading activity;</td>
<td>Choose vocabulary carefully when giving directions;</td>
</tr>
<tr>
<td>Impulsive behavior; occasional behavior alterations with peers</td>
<td>Write social stories with Bill; ask him to supply potential dialogue in conflict management scene;</td>
<td>Practice language to be used to manage peer conflict – role play situations;</td>
</tr>
<tr>
<td>Inaccurate receptive language comprehension; difficulty with abstract and ambiguous language</td>
<td>Write directions on the board; make a visual schedule for Bill (and others) to follow;</td>
<td>Break down directions into manageable steps; provide examples and models;</td>
</tr>
<tr>
<td>Slow expressive motor processing, particular in graphomotor function (writing with pen, pencil)</td>
<td>Offer to provide NCR/carbon paper for note-taking;</td>
<td>Provide notes; ask a peer to serve as a scribe for student;</td>
</tr>
<tr>
<td>Slow visual processing, seen when taking notes</td>
<td>Offer to provide a &quot;Livescribe&quot; audio recording pen;</td>
<td>Provide notes; ask peer to serve as scribe; provide copy of teacher notes;</td>
</tr>
<tr>
<td>Difficult following/executing multiple steps directions</td>
<td>Ask Bill to orally repeat directions; ask peers to repeat directions/steps for the class;</td>
<td>Write down steps on the white board/overhead projector;</td>
</tr>
<tr>
<td>Difficulty staying on topic during conversations and discussions</td>
<td>Redirect Bill when he goes off-topic; ask him what a conversation will be about before the conversation begins; be sure to give the article;</td>
<td>Encourage him to ask for clarification when he does not understand something; be sure to give the article;</td>
</tr>
</tbody>
</table>
Collaborative Consultant Role

You two specialists are going to consult with a classroom teacher regarding Bill, a student who experienced a brain injury that resulted in a cognitive impairment, particularly seen in memory, attention, and processing speed. Dr. Schoo L. Psych has suggested that Bill is eligible to receive special education service under the educational label of traumatic brain injury or cognitive impairment, with a secondary label of speech and language impaired.

Your goal is to help Bill’s teacher include Bill in the general education classroom for as much time as is practical and is beneficial for Bill and for his peers. Recognize that Bill’s teacher is quite uptight about meeting Bill’s needs in his/her classroom.

In order to be prepared for this consulting experience, you have read the Bill’s entire cumulative file, while you can comfortably conclude that his classroom teacher has not done so. You reviewed the curriculum used in his class and have observed Bill in action in the classroom and on the playground. Now you would like to meet with her to find out what her concerns are and to see how you all might work together. You recognize that she has 26 students in her classroom and that she has given up her break time to talk with you.

<table>
<thead>
<tr>
<th>Student Profile: Bill</th>
<th>Age: 11</th>
<th>Grade: 5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DATA</strong></td>
<td>Speech and Language Pathologist Recommendations</td>
<td>Education Specialist Recommendations</td>
</tr>
<tr>
<td>Below Average Cognitive Function (IQ: 68; VIQ: 61; PIQ: 90)</td>
<td>Express appreciation for taking the time to meet;</td>
<td>Express appreciation for taking the time to meet;</td>
</tr>
<tr>
<td>Received services for students with language impairment</td>
<td>Affirm that you enjoyed observing in his/her classroom;</td>
<td>Affirm that you enjoyed observing in his/her classroom;</td>
</tr>
<tr>
<td>Impulsive behavior; occasional behavior altercations with peers</td>
<td>Find out his/her concerns for Bill; affirm the challenge of managing and supporting impulsive behavior of students;</td>
<td>Find out his/her concerns for Bill; affirm the challenge of managing and supporting impulsive behavior of students;</td>
</tr>
<tr>
<td>Inaccurate receptive language comprehension; difficulty with abstract and ambiguous language</td>
<td>Find out his/her concerns for Bill; acknowledge why he/she may have tried a particular strategy;</td>
<td>Find out his/her concerns for Bill; acknowledge why he/she may have tried a particular strategy;</td>
</tr>
<tr>
<td>Slow expressive motor processing, particular in graphomotor function (writing with pen, pencil)</td>
<td>Brainstorm ways you may be able to work together; brainstorm ways that you might assist him/her;</td>
<td>Brainstorm ways you may be able to work together; brainstorm ways that you might assist him/her;</td>
</tr>
<tr>
<td>Slow visual processing, seen when taking notes</td>
<td>Continue to brainstorm ways you and the teacher might accommodate for the slow processing;</td>
<td>Continue to brainstorm ways you and the teacher might accommodate for the slow processing;</td>
</tr>
<tr>
<td>Difficult following/executing multiple steps directions</td>
<td>Continue to brainstorm ...;</td>
<td>Continue to brainstorm ...;</td>
</tr>
<tr>
<td>Difficulty staying on topic during conversations and discussions</td>
<td>Set up a follow up time to meet again;</td>
<td>Set up a follow up time to meet again;</td>
</tr>
</tbody>
</table>
Appendix C

Case Studies for Instruction with SLP Control Group
Emmie’s Story
Emmie had a severe injury to the frontal part of her brain (just behind the forehead) when she was eight days old. She had PT, OT, and SLP services until she was about three years old, and she seemed to have recovered well in the physical area, prompting her doctor to consider her “cured.” Emmie’s mom struggled with her “colicky” nature during Emmie’s first years, and she was concerned by her daughter’s strong emotional outbursts. Emmie could swing from being loving and joyful to scratching her mother’s face and throwing fierce temper tantrums. Family members felt that Emmie’s mother was overprotective and not strict enough.

Emmie spent her preschool years at home, where she developed a simple routine of daily play activities. Emmie seemed generally happy, running from one activity to the next. At age 5, she was enrolled in public kindergarten. After the first week, the principal called Emmie’s mother. He and the teacher agreed that Emmie was not ready for kindergarten; she had trouble staying in her seat, could not pay attention, and behaved in a “silly” and immature manner. Once when the teacher praised her, Emmie swept all the materials off her desk and then laughed at the teacher’s shocked response. The principal felt that another year at home would allow Emmie to “mature” and become ready for school.

Jack’s Story
At age 4, Jack fell out of a tree from a height of 18 feet. He broke his arm and collarbone and was in a coma for several days. When he awoke, he was very quiet and subdued, but quickly regained his previous energy. Jack’s first months at home were hectic for his parents; he seemed irritable, needed very little sleep, and could pay attention to an activity for only a few seconds. His feelings were easily hurt, and he responded to even minor interruptions with outbreaks of crying, running away, swearing, and abusive language directed at his parents. His parents felt that they were constantly walking on eggshells around him. Jack could not seem to learn from his parents’ efforts to curb his outbursts. They were very worried about what would happen when he started kindergarten in the fall.

Felicia’s Story
Felicia was almost nine years old and in the beginning of third grade when she acquired a brain injury as a passenger in an auto accident. At the time, she was attending an academically challenging private school where all of her siblings had gone. After recovering for several months, Felicia made the transition back to school on a part-time basis and finished the school year with her class. Because she had residual word-finding difficulties, spelling deficits, and trouble remembering what she had read, Felicia worked with an SLP over the summer. Before her accident, Felicia had been a model student and had done well in first and second grades; however, the pattern of problems that arose after her injury suggested she had unrecognized preexisting weaknesses in reading and spelling. Now, in addition to these problems, Felicia had new and significant cognitive / cognitive-communication deficits.

Felicia was unable to return to her soccer team in the spring because she was so fatigued she had to nap after school each day. In the fall, she started attending soccer practices but dropped
off the team after two sessions, stating she didn’t like it anymore. During the first semester of her fourth-grade year, Felicia worked hard in school and with her tutor. Each night, her parents helped her with her homework, which often required three hours to complete. Felicia began to complain of being “dumb.” She felt left out by her friends who talked about after school activities in which she was no longer included. She spent lunch and recesses alone and frequently cried over how different her life was.
Appendix D

ABI Parenting/Teaching Proficiencies Scale
<table>
<thead>
<tr>
<th>Proficiency Area</th>
<th>How proficient are you at the current time in this area?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Identify student’s cognitive or behavior problems clearly and specifically to allow for accurate observation and measurement.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>2 Link student’s problems/symptoms to underlying neurodevelopmental deficits/challenges.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>3 Identify specific and progressive learning objectives for student.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>4 Perform a task analysis of a complex skill.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>5 Structure the environment to support positive behavior and effective learning.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>6 Arrange positive antecedent conditions to support organized, successful behavior.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>7 Use visual cues and physical prompts to support student’s successful behavior.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>8 Respond effectively to a behavior problem.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>9 Identify the causes of a recurring behavior problem.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>10 Modify lessons and assignments to meet student’s learning and social needs.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>11 Understand how student’s challenges have affected his/her family and identify and meet family needs/priorities.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>12 Collaborate with parent/school team.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>13 Hold a similar understanding of student’s needs and how to intervene.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>14 Using testing information effectively in planning programs and accommodations.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>15 Participate in the individualized education plan process to address student’s educational needs specifically and comprehensively.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>16 Identify and obtain community supports and services.</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>
Appendix E

Case Study for Pre- and Posttesting with Experimental Group
Case Study for Pre- and Posttesting with Experimental Group

Case Study

Ben is a nine-year-old boy who sustained a moderate TBI when he was hit by a car last summer. He also sustained a broken arm, leg, and collarbone. It is now six months after his accident and his arm, leg, and collarbone have healed. He looks and sounds like he did before his accident. Things are different, though. He is now in the third grade and is really struggling. He has lost some of his friends because of several kicking incidents. One of his teachers reported that he doesn’t seem to try or pay attention in class. His grades are slipping.

Nobody seems to understand that Ben has “hidden deficits” as a result of his TBI. You are part of the school team that is working together to facilitate Ben’s communication and academic success.

1. What classroom and playground tasks/activities might be hard for Ben? (list 3)

2. What might be the underlying cognitive or linguistic deficits contributing to the hard time Ben is having academically and socially? (list 3)

3. What specific things could you do (as part of Ben's team) to facilitate success in the classroom and on the playground? (list 3)

4. Think about the team aspect of providing services for Ben. List some DOs and DON'Ts to collaborating with the other professionals on his team. (list 3)

5. Write a brief script of how you would explain the concept of "growing into a deficit" to Ben’s parents. (Leave blank if you don’t know what you would say.)

6. List the things you think are the most important aspects of working with students with TBI. (Or the things most important to remember and/or do when working with students with TBI.)
Appendix F

TBI Knowledge Score Rubric
TBI Knowledge Score Rubric

**Question 1: What classroom and playground tasks/activities might be hard for Ben?**

Score each answer they give with this rubric:

<table>
<thead>
<tr>
<th>Points</th>
<th>Qualifications</th>
</tr>
</thead>
</table>
| 2      | - Specific to TBI; most likely OR typical difficulty for TBI  
        | - Must be an activity or task (not a symptom or deficit area) |
| 1      | - Could be accurate in the sense that the answer is a “difficult task” but it is generic  
        | - Possible, but not most likely |
| 0      | - It is very unlikely that this task/activity would be difficult  
        | - The answer is NOT an activity / task  
        | - The answer is a restatement of the question (e.g., “playing on the playground” or “participating in classroom tasks”) |

**Question 2: What might be the underlying cognitive or linguistic deficits contributing to the hard time Ben is having academically and socially?**

Score each answer they give with this rubric:

<table>
<thead>
<tr>
<th>Points</th>
<th>Qualifications</th>
</tr>
</thead>
</table>
| 2      | - Specific to TBI  
        | - most likely OR typical deficit associated with TBI (e.g., memory, attention, impulsivity, executive functioning) |
| 1      | - Possible, but not most likely deficit associated with TBI (e.g., language impairment, syntax deficit, reading comprehension deficit) |
| 0      | - It is very unlikely that this would be an underlying cognitive or linguistic deficit  
        | - The answer provides a deficit that might be likely, but is not cognitive or linguistic (e.g., neuromuscular weakness)  
        | - The answer does not provide a deficit (e.g., provides a task or activity)  
        | - The answer restates the question (e.g., “impairment in cognitive skills”) |

**Question 3a: What specific things could you do (as part of Ben’s team) to facilitate success in the classroom and on the playground?**

Score each answer they give with this rubric:

<table>
<thead>
<tr>
<th>Points</th>
<th>Qualifications</th>
</tr>
</thead>
</table>
| 2      | - EBP = contextualized paradigm  
        | - Contextualized key words/concepts  
        | - real life activities or tasks  
        | - multiple contexts/settings  
        | - functional / facilitates participation in real world tasks  
        | - metacognitive strategy incorporation  
        | - curriculum-based  
        | - personally relevant material/tasks |
| 1      | - |  
| 0      | - |
| 1 | Traditional paradigm  
**Traditional key words/concepts**  
- clinically-based / clinical setting / pull out services  
- drill  
- isolated tasks  
- repairing discreet cognitive skills  
- expert driven |

| 0 | • Not appropriate  
• Very unlikely that anyone would ever advise a clinician or educator to do this |

**Question 5:** Write a brief script of how you would explain the concept of “growing into a deficit” to Ben’s parents.

Give 1 point for each element included (max points = 3):
- Initially, behavior may have been age appropriate / didn’t notice the deficits in light of age expected behavior
- Demands or expectations increase/change; as he ages, expectations or demands may increase
- The deficit/difficulty may become more obvious / he can’t meet those demands / he isn’t developing the skills needed to meet those demands
Appendix G

Semi-Structured Interview Questions
Semi-Structured Interview Questions

Background Questions – Child or Adolescent with TBI

Can you tell me about your life since you had your brain injury?

Prompts: What’s changed? Stayed the same? Tell me about the hospital, therapy, going back to school...

Background Questions – Parent(s) or Caregiver(s)

Can you tell me a bit about life since XXX had his/her brain injury?

Prompts: hospital, rehab/therapy, back-to-school process, changes in XXX, changes in your lives

Background Questions – Teacher and SLP

What do you know about XXX’s history? Can you tell me a bit about your relationship with XXX?

Prompts: How long have you known XXX? When did you start working with XXX? How would you describe your role with XXX? How have you been involved in making the transition from rehab back into school?

A. Questions about what is working (or what is successful) and why:

1. First, I’d like to learn about some of the things about school that you feel good about. Are there things that are working out well for you [or child’s name] at school? In other words, what is successful at school for you [or child’s name]?
   Prompts:
   Certain subjects? Activities? Being around certain people?

2. What tells you that ______ is working well?
   Prompt:
   If someone came to your [or child’s name] school, what would I see that would let me know, yeah, that’s working out really well for XXX?

3. What makes those things work well?
   Prompts:
   Are there things that you do that make it work? [Stay in the “what works” loop until it seems exhausted.]

B. Questions about what is not working (or what is not successful) and why:

1. Now, I would like to learn about some of the things about school that you don’t feel so good about. Are there things that you feel aren’t working so well?
   Prompts:
   Certain subjects? Activities? Being around certain people?

2. What tells you that it’s not working out well? OR How can you tell it’s not working out well?
   Prompt:
   If someone came to watch you [or child’s name] at school, what would they see that would let them know, oh yeah, I can tell that’s not working out really well for XXX?
3. Why do you think those things aren’t working well?
   **Prompts:**
   - Are there things you do or don’t do that make it not work? Other people? Things about school itself?
   - What do you think might help? Or make it better?

4. If you could make one thing work out better than it is right now, what would that be?

5. Why did you choose ______?

6. What do you think it would take to make that happen?

**C. Follow-up question about defining success (if needed)**
So, what I am interested in particular, is how you would define success for XXX related to school?

**D. Follow-up question about successful service delivery (if needed)**
What could everyone do differently (or keep doing, if helpful) to increase the likelihood of success?