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Interdisciplinary Collaboration Practices between Education Specialists and Related Service Providers

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Students with moderate to severe disabilities benefit most when interdisciplinary teams collaborate to deliver individualized instruction, supports and services. This research study seeks to capture a description of education specialists' collaborative experiences working with interdisciplinary teams composed of speech language pathologists, occupational therapists, adapted physical educators, school psychologists and school nurses. The central question that guided this study asked K-12 education specialists to describe how they collaborate with their interdisciplinary teams in four domains of assessment, curriculum development, instruction, and progress monitoring. A descriptive mixed methods approach, which included surveys and interviews, was used to explore this experience. Overall, education specialists reported that teams collaborate most frequently in the areas of assessment and IEP goal development. Findings indicate that teams respectfully share resources, knowledge of students and behavior support expertise, but lack consistency and a shared systematic approach towards collaboration, especially in the areas of instruction and progress monitoring. Implications for practice and research will be described.

Keywords: Students with moderate to severe disabilities, Interdisciplinary Collaboration, Education Specialists, Related Service Providers, Progress Monitoring.

Over the past 20 years medical advances have enabled the survival of an increasing number of children with moderate to severe disabilities. At the same time advances in mobile medical technology made it possible for children to receive their critical heath care services at school. The rising numbers of students with significant disabilities combined with the reduction of school nursing staff have started to overwhelm school districts and special education programs (Aruda, Kelly, & Newinsky, 2011; Best, Heller, & Bigge, 2010). In this environment, education specialists struggle to maintain and improve instructional quality for their students with

moderate to severe disabilities, as the higher levels of instructional need also require higher levels and complexity of services to meet those needs.

Despite research documenting that the implementation of interdisciplinary collaborative practices between education specialists (special education teachers) and related service providers have been critical for student success for individuals with moderate to severe disabilities, actual collaborative practices between teachers and related services providers has been limited (Baxter, Brookes, Bianchi, Rashid, & Hay, 2009; Xyrichis & Ream, 2008; Zabel, Kaff, & Teagarden, 2014). Unfortunately, there has been a paucity of research on the type, frequency and ways to improve collaborative practices between educational specialists and related service providers. In fact, based on our review of current literature, related service providers, such as speech and language pathologists, have contributed much of the research on interdisciplinary collaborative best practices in special education.

Many education specialists have viewed related services as completely separate from their own academic instruction. Without specific professional training, it is unusual that education specialists attempt to regularly embed related service provider intervention strategies within their own daily academic instruction (Hamilton-Jones & Vail, 2014; Pülschen & Pülschen, 2015). Education specialists are confronted with large caseloads, few resources, and a vast array of individual student academic, functional, social, behavioral, and communication needs. It is daunting for even experienced education specialists to effectively coordinate and collaborate with all related service providers to address the unique learning needs of each child, and then provide specific supports for each of these intervention strategies within daily academic instruction (Utley & Rapport, 2002). There is no formal mechanism built-in to most pre-service teacher training or post graduate course work to support these important related service provider goals in specialized academic instruction for students with moderate to severe disabilities, where it is needed most. Classroom staff focused on meeting specialized academic instruction goals (reading, writing, math) often do not directly support the skills taught by related service providers due to lack of knowledge, lack of training, lack of models, lack of time and/or sometimes lack of willingness to collaborate (Hamilton-Jones & Vail, 2014; Pülschen & Pülschen, 2015).

The central question of this study asked K-12 education specialists who teach students with moderate to severe disabilities to describe how they collaborated with their interdisciplinary teams of related service providers in the four domains of assessment, curriculum development, instruction, and progress monitoring. The findings of this study identified, described and reported the actual collaborative practices reported by 19 education specialists with various related service providers in the four domains of assessment, curriculum development, instruction, and progress monitoring. Data collected from survey and face-to-face interview responses represented only the education specialists' perspectives on their local interdisciplinary teams' collaborative practices, which were all located in San Diego and south Riverside Counties in Southern California.

Methods

The research question that guided this study asked how K-12 education specialists who teach students with moderate to severe disabilities collaborate with related service providers in the four domains of assessment, curriculum development, instruction and progress monitoring. A mixed methods approach was selected for this study utilizing both quantitative online survey and in-depth qualitative interview data. Mixed methods were selected for this study based on the results of similar and parallel studies investigating the collaborative practices of speech and language pathologists, mental health professionals and nurses who were members of interdisciplinary teams in special education and medicine (Baxter et al., 2009; Cirrin, Schooling, Nelson, Diehl, Flynn, Staskowski, Torrey, & Adamczyk, 2010; De Bortolio, Balandin, Foreman, Matheisen, & Arthur-Kelly, 2012; Donaldson & Stalmer, 2014; Meyers, Tobin, Huber, Conway, & Shelvin, 2015; Xyrichis & Ream, 2008).

This study targeted an education specialist participation population who taught students with moderate to severe disabilities in public and non-public education settings. Survey and interview questions were designed to explore these education specialists' interdisciplinary collaborative practices with related services providers. Speech and language pathologists have conducted much of the research on interdisciplinary collaborative practices within special education. That research has typically focused on sub disciplinary concerns such as speech disorders and SLP service delivery models but does not specifically address interdisciplinary collaborative practices with teachers.

Participant selection criteria included any person who (1) held a valid California Commission on Teacher Credentialing (CCTC) Education Specialist Instruction Credential with Authorization for Moderate/Severe Disabilities or equivalent and (2) was employed in a teaching position requiring a CCTC Education Specialist Instruction Credential with Authorization for Moderate/Severe Disabilities or equivalent (3) in grade levels K through 12 (4) in any public or non-public school in Southern California. Fifty education specialists were invited to complete the online survey. Participants were recruited from recommendations from professional colleagues and community members.

Participants who fully completed the survey included 19 education specialists who provided instruction to K-12 students with moderate to severe disabilities in San Diego County and southern Riverside County public and non-public schools. In depth interviews were conducted with five participants who were selected from the 19 education specialists who had completed the online survey. Five interview participants were purposely selected because they provided detailed responses in the optional open-ended online survey textboxes and/or indicated a proactive approach to collaborating with team members on many of the survey questions. Three of those participants completed a face to face in-depth interview with the researchers. Two interviews took place in the participant's home and one took place in the participant's classroom.

Data instrument designs were modeled on prior descriptive research concerning interdisciplinary collaborative practices conducted by speech and language pathologists, education specialists

and nurses (Bauer, Iyer, Boon, & Fore 2010; Baxter et al., 2009; Cafiero, 2011; Carter, Prater, Jackson, & Marchant, 2009; De Bortoli et al., 2012; Donaldson & Stalmer, 2014; Meyers, Tobin, Huber, Conway, & Shelvin, 2015; Utley & Rapport 2002; Xyrichis & Ream, 2008; Zabel, Kaff, & Teagarden, 2014). Survey questions were targeted specifically to determine the frequency and type of parameters that would accurately describe the collaboration practices between education specialists and related services providers in the four domains of assessment, curriculum development, instruction, and progress monitoring. The interviews conducted by the researchers included questions on demographics, school settings, student populations, professional team composition and five qualitative open-ended questions concerning collaborative practices with related services providers. Interview participants were provided a transcript of the entire interview for checking and clarifying any response information. The researchers then edited the transcripts based on the edits and corrections provided by interview participants.

Electronic survey data was collected using SurveyMonkey online survey instruments. Survey data was partly processed using the SurveyMonkey analysis tools. The research question was broken into seven categories that included demographics, related services, assessment, curriculum development/individual education plan (IEP) goal development, instruction, progress monitoring, and dynamics of team collaboration. Survey data was analyzed using simple calculation methods to determine response counts for each question and question matrix. Response counts were then quantified as a percentage for each frequency designation and selected type of collaboration parameter practiced by teams in the four domains of assessment, curriculum development, instruction, and progress monitoring. The open ended optional qualitative survey responses were processed separately using qualitative interview analysis coding plan method. After final transcript participant corrections were completed the researchers began the coding process following the qualitative interview analysis coding plan method that consisted of three cycles of hand coding based on a predetermined codebook of 89 descriptive codes. Key items not listed in the codebook were given a unique code. The three cycles of hand coding were completed for all interviews. The next section will present the results of the who, when, and how of interdisciplinary collaboration between education specialists and related services providers.

Results

The results of this study will be presented in the following sections: demographics, related services, assessment, curriculum development/IEP goal development, instruction, progress monitoring, and dynamics of team collaboration. Data collected from survey and interview responses represented only education specialists' perspectives on their local interdisciplinary teams' collaborative practices, which were all located in San Diego and south Riverside Counties in Southern California.

As we analyzed the survey data, we realized that the amount of data far exceeded the limits of a journal article and needed to be paired down to the just the data analysis that was essential to the research question. The research question that guided this study was: How do K-12

education specialists who teach students with moderate to severe disabilities collaborate with related services providers in the four domains of assessment, curriculum development, instruction, and progress monitoring? To address the main question the researchers selected to analyze the data identifying the most frequent related services collaborators and the overall frequencies of collaboration in the four domains of assessment, curriculum development, instruction, and progress monitoring. Also analyzed were a) the collaborative practices participants believed that their own interdisciplinary teams did well, b) the collaborative practices participants identified as the most likely ways to improve current collaborative practices with their interdisciplinary team members and c) the barriers that participants identified as the most important barriers to collaboration faced by their interdisciplinary teams.

Demographics

Gender. Out of 19 Education Specialists who took the survey 18 were female (95%) and there was only one male (5%).

Age. Out of 19 education specialists who took the survey, seven participants (37%) were between the ages of 30-39 years old. Five (26%) were between the ages of 30-39 years old. Three (16%) were between were between the ages of 40-49. There were two participants (11%) between the ages of 50-59, and two (11%) were between were between the ages of 60-69.

Education. Out of 19 education specialists who took the survey, 14 (74%) held a master's degree, and five (26%) held a bachelor's degree.

Teacher Credentials. Slightly over 89% of participants held a valid Education Specialist Moderate/Severe Disabilities California Commission on Teacher Credentialing (CCTC) Credential, 16% held the equivalent Severely Handicapped CCTC Credential and 21% also held the more recent Autism Spectrum Disorder Added Authorization (ASDAA).

Years Teaching. As a group of 19 education specialists, 7.11 years was the average total years teaching. As a group of 18 education specialists (1 no response), 7.44 years was the average total years teaching students with moderate to severe disabilities in a position requiring a CCTC Education Specialist Instruction Credential with Authorization for Moderate/Severe Disabilities or equivalent.

School Sites. Over 94% of all participants reported that they worked at public school, 16% worked at a non-residential special school serving only students who have disabilities, 11% worked at private schools, and 5% worked in a residential setting that included students with and without moderate/severe disabilities (e.g. Military School, Court School). One participant wrote in, "Other - Non-public school servicing 17 school districts in San Diego and Riverside Counties."

Related Service Professional Collaboration

Education specialists reported on their collaborative relationships by identifying the most frequent related service provider collaborators. To address the main question the researchers selected the six most common types of related services, out of the 18 listed on the survey, to closely analyze during the interviews. This group included speech and language pathologist, occupational therapist, physical therapist, adaptive physical education teacher, psychological services/school psychologist and school nurse/health services. See Table 1, *Frequency of Collaboration*, for details on

the rates of collaboration with education specialists.

Table 1

Frequency of Collaboration

	Daily	1x/ week	1x/ month	4x/ year	2x/ year	1x/ year	N/C	S/N/R
Speech & Language Pathologist								
Responses	9	8	1	0	0	0	1	0
Percent of Time	47%	42%	5%	0	0	0	5%	0
Occupational Therapist								
Responses	1	12	2	1	1	1	1	0
Percent of Time	5%	63%	11%	5%	5%	5%	5%	0
Physical Therapist								
Responses	0	3	5	3	0	0	3	5
Percent of Time	0	16%	26%	16%	0	0	16%	26%
Adaptive Physical Education Teacher								
Responses	0	10	2	0	0	2	2	3
Percent of Time	0	53%	11%	0	0	11%	11%	16%
Psychological Services								
Responses	1	7	5	4	0	0	2	0
Percent of Time	5%	37%	26%	21%	0	0	11%	0
School Nurse Health Services								
Responses	6	3	2	4	2	0	0	2
Percent of Time	32%	16%	11%	21%	11%	0	0	11%

Table 1, *Frequency of Collaboration*, presented participants' responses to reports that SLPs would collaborate daily at 47% of the time and at 42% for one time per week. In the optional response box one participant (5%) reported that their SLP worked with her daily. Four participants wrote in that their SLP worked with them two times per week. In fact, SLP services were required by every student on each participants' caseload, nevertheless, one participant reported that although SLP services were required, there was no collaboration (N/C). One participant at once per month reported the lowest regular SLP collaboration.

Data indicated that the occupational therapist was the second most frequent collaborator for many education specialists. OTs consulted with participants and worked

with students and classroom staff for 1 time per week 63% of the time. One participant (5%) reported that her OT worked with her and her students every day. Participants especially appreciated when OTs modeled sensory and behavior support strategies for all adults and helped aides implement these strategies through guided practice. In Table 1, *Frequency of Collaboration*, two participants (11%) responded that they collaborated with their OT one time per month. One participant (5%) reported that they only collaborated with their OT four times per year, and another participant (5%) sited the OT was only available two times per year to work together. Unfortunately, many participants reported that there was only one OT in their school district, or worse the local area special education local planning area (SELPA) contracted their OT and therefore, they rarely saw them. OTs were typically itinerate and spent much of their time in IEP meetings.

Three participants (16%) wrote in that their adaptive physical education teachers worked with the students in their classrooms two to three times per week. According to Table 1, *Frequency of Collaboration*, adaptive physical education teachers consulted with 10 participants and worked with students and classroom staff for one time per week 53% of the time. In the optional response box one participant (5%) reported that their APE teacher worked with her students 1 time per week. One participant (5%) said the only time she collaborated with her APE teacher one time per year. Two participants (11%) reported that APE teacher services were required, but there was no collaboration (N/C). Three participants (16%) reported that APE teacher services were not required (S/N/R).

According to Table 1, *Frequency of Collaboration,* a school psychologist/psychological services consulted with one participant (5%) and worked with students daily. In the optional response box one participant (5%) reported that a contracted behavior specialist worked with the participant daily. A school psychologist also consulted with seven participants and worked with the participant one time per week 37% of the time. In the optional response box two participants (11%) reported that their school psychologist worked with them one time per week, for a total of 47% for one time per week. In Table 1, five participants (26%) responded that they collaborated with their psychological services provider one time per month. Several participants reported frequencies that were not listed as survey options. One participant (5%) reported that the psychologist collaborates with her four times a year. A different participant (5%) reported that the psychologist collaborated with her two times per month when there is no triennial, but the psychologist came in one time per week during triennial meeting or for Behavior Support Plan preparation. Another participant stated that collaboration with the school psychologist depended greatly on student need:

> Psychological collaboration depends on students' needs; this year it was four times per year, however, two years ago collaboration was more frequent with six triennial assessments and the need for a Functional Analysis Assessment/Behavioral Intervention Plan (FAA/BIP) for we will meet to collaborate 10 times per year.

A different participant (5%) reported that psychological services were required, but there was no collaboration (N/C).

According to Table 1, *Frequency of Collaboration*, school nurse/health services consulted with six participants (32%) and worked with students daily. School nurse/health services also consulted with three participants and worked with the participant one time per week 16% of the time. In the optional response box one participant (5%) reported that their school nurse/health services worked with them one time per week, for a total of 21% for one time per week. In Table 1, four participants (21%) responded that they collaborated with their school nurse/health services one time per month. Four participants (21%) reported that school nurse/health services collaborated with her four times a year. Two participants (11%) reported school nurse/health services collaborated with them two times per year. Two participants (11%) reported that school nurse/health services were not required (S/N/R).

By far, speech and language pathologists were the participants' most frequent related services collaborator in the moderate to severe setting according to their overall frequency of collaboration. During the three interviews, participants made frequent comments that they wished their SLP were based at their school so that they would be able to interact with them on a daily basis to better support their students with communication, social and behavioral issues. Participants uniformly reported that their SLP was their most important collaborator. Data indicated that the occupational therapist was the second most frequent collaborator for many participants. OTs consulted with education specialists and worked with students and classroom staff frequently. Education specialists reported that adaptive physical education teachers were their third most frequent related services collaborators according their overall frequency of collaboration.

Assessment

The assessment data (Table 2) presents results from 19 participants who reported their frequency of collaboration with related services providers in key areas of assessment:

- Share findings of assessment with team members prior to IEP meeting
- Write up reports as an interdisciplinary team prior to IEP meeting as a team
- Use assessment results to help determine areas of need to focus on IEP goals and curriculum development.
- Meet as a team to determine areas of needed assessment prior to conducting assessment
- Collaborate on modifying assessments
- Conduct assessments together

The highest reported frequency of specific collaboration practices between education specialists and related service providers during assessment occurred at a rate of 53% when participants used assessment results as a team to help determine areas of need to focus on IEP goals and curriculum development as well as 53% when participants met as a team to determine areas of needed assessment prior to conducting assessment.

Table 2
Assessment - Frequency of Collaboration

	Always	Most of the time	About half the time	Once in a while	Never
Meet as a team to determine areas of needed assessment prior to conducting assessment	37%	53%	5%	0	5%
Collaborate on modifying assessments	11%	47%	21%	16%	5%
Conduct assessments together	16%	16%	16%	26%	26%
Share findings of assessment with team members prior to IEP meeting	32%	37%	16%	11%	5%
Write up reports as a transdisciplinary team prior to IEP meeting	21%	16%	21%	21%	21%
As a team, used assessment results to help determine areas of need to focus on IEP goals and curriculum development	53%	16%	21%	5%	5%

Curriculum Development/IEP Goal Development

The curriculum development/IEP goal development section of the survey was formatted as a matrix, with rows of curriculum development/IEP goal development areas (see bullets below) and columns of collaboration time frequencies in the form of quantitative Likert Scale radio buttons for each time interval.

- Needs of the student were agreed upon in ALL areas of development as team
- IEP goals were written collaboratively with multiple areas of need addressed within one goal
- Curriculum was developed collaboratively

See Table 4, *Curriculum and IEP Goal Development*, for details on collaboration details. Highest reported frequency of specific collaboration practices between education specialists and related services providers during curriculum development and IEP goal development is 37% of participants report IEP goals are written collaboratively with multiple areas of need addressed within one goal all of the time. Also, 42% of participants report the needs of the student are agreed upon in ALL areas of development as team based on collaborative/interdisciplinary assessments most of the time.

Table 3

Curriculum Development/IEP Goal Development - Frequency of Collaboration

Activity	Always	Most of the time	About half the time	Once in a while	Never
Based on collaborative/interdisciplinary assessment – needs of the student are agreed upon in ALL areas of development as team	26%	42%	5%	5%	21%
IEP goals are written collaboratively with multiple areas of need addressed within one goal	37%	21%	0	5%	37%
Curriculum is developed collaboratively	21%	21%	16%	21%	21%

Instruction

The instruction section was formatted as a matrix, with rows of instructional activities and columns of collaboration time frequencies in the form of quantitative Likert Scale radio buttons for each time interval. Highest reported frequency of specific collaboration practices between education specialists and related services professionals during:

- Curriculum planning is done collaboratively
- Curriculum implementation is done collaboratively
- Instruction is delivered collaboratively through co-teaching methods
- Reflection on instruction is done collaboratively.

See Table 4, *Instruction*, for collaboration details. Highest reported frequency of specific collaboration practices between education specialists and related services providers during instruction is 26% of participants report curriculum planning and implementation are done collaboratively most of the time.

Table 4

Instruction - Frequency of Collaboration

Activity	Always	Most of the time	About half the time	Once in a while	Never
Curriculum planning is done collaboratively	11%	26%	16%	32%	16%
Curriculum implementation is done collaboratively	11%	26%	21%	26%	16%
Instruction is delivered collaboratively through co-teaching methods	5%	16%	32%	21%	26%
Reflection on instruction is done collaboratively	16%	16%	11%	32%	26%

Progress Monitoring

The Progress Monitoring section was formatted as a matrix, with rows of progress monitoring activities and columns of collaboration time frequencies in the form of quantitative Likert Scale radio buttons for each time interval. Progress monitoring activities included:

- Progress monitoring data is collected collaboratively
- Progress monitoring data is compiled collaboratively
- Progress monitoring data is analyzed collaboratively
- Decision to modify curriculum is done as a team
- Decision to modify instruction is done as a team and
- Decision to modify other supports is done as a team

See Table 5, *Progress Monitoring*, for collaboration rates of participants. Highest reported frequency of specific collaboration practices between education specialists and related services professionals during progress monitoring is 21% of participants report progress monitoring data is collected and compiled collaboratively all of the time. Also, 21% of participants report the decision to modify curriculum and other supports are done as a team all of the time.

Table 5

Progress Monitoring - Frequency of Collaboration

Activity	Always	Most of the time	About half the time	Once in a while	Never
Progress monitoring data is collected collaboratively	21%	16%	26%	16%	21%
Progress monitoring data is compiled collaboratively	21%	0%	16%	42%	21%
Progress monitoring data is analyzed collaboratively	16%	21%	37%	11%	16%
Decision to modify curriculum is done as a team	21%	16%	5%	26%	32%
Decision to modify instruction is done as a team	16%	11%	16%	32%	26%
Decision to modify other supports is done as a team	21%	21%	16%	37%	5%

Overall, participants reported that interdisciplinary teams collaborated most frequently in the areas of assessment and IEP goal development but lacked consistency and a shared systematic approach towards teaming, especially in the areas of instruction and progress monitoring. Highest reported frequency of specific collaboration practices between education specialists and related services professionals occurred during assessment and IEP goal development.

Participants reported on both the survey and during interviews that increased time with, and location of, service providers was key to improving collaboration. Positive personal relationships between team members fostered more effective and

frequent collaboration. To meet student needs, participants reported it was important to increase communication to solve problems together while respectfully sharing resources, knowledge of students and disciplinary expertise. Additionally, participant interviews revealed that it was important for interdisciplinary teams to solicit administrative support to prioritize the student over administrative concerns. Highest reported frequency of specific collaboration practices between education specialists and related service professionals during progress monitoring 21% of participants report progress monitoring data is collected and compiled collaboratively all of the time. Also 21% of participants reported decision to modify curriculum and other supports are done as a team all of the time.

Dynamics of Team Collaboration

The dynamics of team collaboration section contained four quantitative multiple-choice questions and one optional open-ended qualitative question asking participants to report what important items were not included in this study. Survey questions asked about characteristics of collaboration between education specialists and related services professionals (Table 6), barriers to collaboration (Table 7), and practices that would most likely improve both overall team and individual current collaborative practices (Table 8). These questions each had optional qualitative text fields at the end of each question for participants to add items not included in the provided parameter lists.

Table 6
Dynamics of Team Collaboration - What Teams Do Well

Answer Choices	Response Percent	Response Count
Expertise is shared and respected	84%	16
Shared problem solving	84%	16
Share resources	84%	16
Adapt to schedule changing	84%	16
Meet the needs of the student	74%	14
Team knowledge of student	58%	11
Consistency of services	47%	9
Solicit administrative support	47%	9
Prioritize student needs over administrative concerns	42%	8
Team knowledge of all student IEP goals	37%	7
Provide modeling and guidance to paraprofessional staff	37%	7
Recordkeeping/log of Related Services	26%	5
Set and meet team goals	11%	2
Please add additional team strengths (Optional)	-	3

Table 7

Dynamics of Team Collaboration - Barriers to Collaboration

Answer Choices	Response Percent	Response Count
Time to meet as a team	58%	11
Paraprofessional staff skills & knowledge	42%	8
Large class size / caseload	32%	6
Paperwork	26%	5
Knowledge of student and all IEP goals	26%	5
Resources	21%	4
Consistency of staff	21%	4
Coordination of services	21%	4
Administrative support	21%	4
Flexibility of team members	16%	3
Lack of classroom support staff	16%	3
Follow through	16%	3
Communication between team members	11%	2
Schedule changing	11%	2
Administrative concerns drive instruction	11%	2
Consistency of services	11%	2
Lack of constructive feedback	5%	1
No feedback	5%	1
Expert knowledge not shared	5%	1
Problem solving skills	5%	1
Expertise is undervalued	5%	1
Please add additional barriers to team (Optional)	-	4

Table 8

Dynamics of Team Collaboration - Improve Team Collaboration

Answer Choices	Response Percent	Response Count
Set aside time to meet as a team	47%	9
Modeling and guidance to paraprofessional staff	37%	7
Reduced class size / caseload	32%	6
Consistency of services	21%	4
Student needs before administrative concerns	21%	4
Paperwork reduction	21%	4
Set and meet team goals together	16%	3
Coordination of services	16%	3
Team knowledge of all student IEP goals	16%	3
Team knowledge of student	11%	2
Increased classroom support staff	11%	2
Meet the needs of the student	11%	2

Share resources	11%	2
Solicit administrative support	11%	2
Professional development of collaborative skills	11%	2
Administrative support	11%	2
Improve Communication between team members	5%	1
Flexibility of team members	5%	1
Reduce schedule changing	5%	1
Expertise is shared and respected	5%	1
Adapt to schedule changing	5%	1
Recordkeeping/log of Related Services	5%	1
Follow through	5%	1
Reduction of itinerate travel time	5%	1
Provide constructive feedback	0	0
Shared problem solving	0	0
Please add items not included above (Optional)	-	3

Open-ended questions yield paragraphs of data from each participant, showing that this is an important topic in the world of education specialists. A selection of quotes was chosen to represent the major themes that emerged through analysis of these questions:

> "I think that the school setting has a lot to do with how well people will work together. We are lucky that the school setting allows for us to all meet and speak at all times. In another school setting, it is not the same. It is difficult to collaborate because of the lack of time and the lack of knowledge of each student."
>
> "Collaboration is vitally important for students with moderate to severe disabilities. More so, collaboration is vitally important for support staff. I value the time that my staff is able to learn valuable techniques and teaching strategies from support staff. This is possible with the collaborative or consult process as a service on the offer of FAPE. Years ago, many students had pull out services for OT and SLP. Support staff and myself, as a teacher, could not observe the teaching strategies that were done in order to have skills generalized and utilized beyond 1 time a week for 30 minutes. My staff enjoy learning about each of our student's skills and where they are going during collaborative and consultation times."
>
> "I believe having a mutual understanding and respect for each team member's knowledge is key. Secondly, holding each member and his/her services to high standards is important in order to give each student what he/she deserves. I think a well-rounded program would be one where service providers met regularly and collaborated on instruction and programming to maximize growth and progress towards goals."

> "My OT, SLP, APE teacher, and Psych are each only at my site one or two days per week. This makes in really hard to find time to collaborate as well as schedule IEP meetings."

In-depth Interview Results

The researchers constructed a predetermined interview codebook of 89 descriptive codes representing the supportive practices/dynamics/environmental factors and barriers to collaboration found in this study's survey question matrices. The list of supportive practices, dynamics, environmental factors and barriers to collaboration contained in the survey question matrices and interview codebook come directly from research articles on interdisciplinary collaborative best practices/barriers. This published research supports the design of the study because the peer reviewed articles and meta-analyses provided working definitions of collaboration (Xyrichis & Ream, 2008) and identified a large group of interdisciplinary collaborative best practices in special education (Bauer et al., 2010; Utley & Rapport, 2002) that were used in this study to develop survey and interview research instruments, the interview codebook of 89 descriptive codes, and the interview coding plan.

Interview question responses were analyzed to provide more descriptive detail to parallel survey questions. Interview responses were analyzed using a hand coding method to specifically determine the frequency and type of characteristics that accurately describe the collaboration practices between participants and their team of related services providers in the four domains of assessment, curriculum development, instruction, and progress monitoring. To establish a research-based bank of collaborative characteristics (and barriers) the researchers constructed a predetermined interview codebook of 89 descriptive codes from the collaboration characteristics and barriers contained in each of this study's survey question matrices. This predetermined interview codebook of 89 descriptive codes was used as coding checklist when analyzing the interview data as part of an interview analysis coding plan. The qualitative interview analysis coding plan method consisted of three cycles of hand coding based on the predetermined codebook of 89 descriptive codes. The codebook represented the supportive practices/dynamics/environmental factors and barriers to collaboration contained in the survey questions matrices. Coding cycle one identified the types supports or barriers to collaboration mentioned in each interview, cycle two developed structural categories and cycle three used the identified categories to developed themes. During the coding process the researchers checked off any coded collaboration parameter on a grid that was mentioned during the interviews for coding cycle one. During coding cycle two, the researchers calculated the frequencies of selected codes and developed structural categories based on similarities of selected codes, and cycle three used the identified categories to developed themes. The goal of the interview analysis coding plan was to identify categories of collaboration characteristics (and barriers) found in the interview data; leading to overall qualitative collaborative theme results for this study.

Coding cycle one identified the types supports or barriers to collaboration mentioned in each interview, cycle two developed structural categories and cycle three used the identified categories to

developed themes. During the coding process the researchers checked off any coded collaboration parameter on a grid that was mentioned during the interviews for coding cycle one. The researchers created a collaboration parameters chart based on the codes from each key category of data from this study. Data codes included:

- Type of Collaborator (16 codes)
- Frequency of Collaboration (5 codes)
- Assessment Collaboration (6 codes)
- Curriculum Development (CD) & IEP Goals (G) Collaboration (3 codes)
- Instruction (I) Collaboration (4 codes)
- Progress Monitoring (PM) Collaboration (6 codes)
- Supports for Collaboration (27 codes)
- Barriers to Collaboration (22 codes)

During coding cycle two, the researcher calculated the frequencies of selected codes and developed structural categories based on similarities of selected codes. Categories included:

- Most frequent collaborators
- Consistency of services
- Personal relationships with collaborators
- Time to collaborate together
- Administrative supports
- Resources
- Scheduling (IEP meetings, services, time to collaborate)
- Training (Professional Development, classroom assistants)
- Location
- Large Caseloads

Coding cycle three used the identified categories to develop themes based on what participants thought was most important to create strong ongoing collaboration with their interdisciplinary teams. Themes were the overarching things that needed to be in place that participants identified as "make it or break it:"

- Low staff turnover - enabled respectful long-term relationships to develop, with low turnover training together was possible and fostered long term collaboration; otherwise participants reported that they had to "start all over again" with someone new.
- Full time staff at school site - was the most important factor for frequent collaboration
- Reasonable caseloads - time for collaboration, training, resources, more flexible schedules
- Model strategies for instructional assistants - was the most important factor for embedding related services strategies into classroom instruction.

Participants reported that when frequent collaboration happened, related services providers were *full time at school sites* and there was *consistency in staffing* with low turnover of providers. *Reasonable caseload* sizes enabled both education specialists and services providers to *set aside time to meet as a team*. *Respectful long-term relationships* between education specialists and related services providers fostered closer collaboration. When related services providers *modeled strategies for instructional assistants* in the classroom, student's exposure to consistent interventions increased. Participants reported that *training together* with related services providers to *embed strategies and supports into daily instruction* improved overall outcomes for students with moderate to severe disabilities.

Discussion

To maximize benefit to students every resource and service needs to be fully leveraged by education specialists and

related services providers. This research is important because for students with severe disabilities, effective interdisciplinary collaboration between education specialists and related services providers is key to support ongoing progress in functional, academic, behavioral, social, and communication goals in the four domains of assessment, curriculum development, instruction, and progress monitoring. Participants reported that regular interdisciplinary collaboration with an established team of related services providers was vitally important to meet student needs but was not implemented systematically by all team members to consistently embed strategies and supports from each discipline into daily specialized academic instruction.

For students who have moderate to severe disabilities, participants reported that regular interdisciplinary collaboration supported progress on functional, social and communication goals, which facilitated progress on academic goals as well. Positive personal relationships between team members fostered more effective and frequent collaboration. Time with, and location of service providers was key to improving collaboration. To meet student needs, participants reported that it was important to increase communication to solve problems together while respectfully sharing resources, knowledge of students and disciplinary expertise. Additionally, participant interviews revealed that it was important for interdisciplinary teams to solicit administrative support to prioritize the student over administrative concerns. Overall, participants reported that interdisciplinary teams collaborated most frequently in the areas of assessment and IEP goal development but lacked consistency and a shared systematic approach towards teaming, especially in the areas of instruction and progress monitoring.

The limitations of this study included a small sample size and geographical region. Nevertheless, the significance of this study is that it will help provide additional foundational knowledge and further deepen professional understanding and improve the ability of education specialists to case manage, interpret, disseminate, and apply a wide range service provider supports and strategies into real world academic instruction for students with moderate to severe disabilities. This study is also important because there is a paucity of research from the education specialist's perspective on interdisciplinary collaboration with related service providers. This study investigated and described collaborative teaming practices from *only* the education specialist's perspective. Our hope is that this small contribution of descriptive baseline data to the field of special education for students with moderate to severe disabilities will help increase the possibility that interdisciplinary collaborative practices become embedded in pre-service teacher education and at district level in-service professional development training programs.

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