University of Wisconsin Milwaukee

UWM Digital Commons

August 2021

School-Based Augmentative and Alternative Communication Collaboration During COVID-19

Nicole Kocanda
University of Wisconsin-Milwaukee

Follow this and additional works at: https://dc.uwm.edu/etd

Part of the Other Rehabilitation and Therapy Commons

Recommended Citation

SCHOOL-BASED AUGMENTATIVE AND ALTERNATIVE COMMUNICATION

COLLABORATION DURING COVID-19

by

Nicole Kocanda

A Thesis Submitted in

Partial Fulfillment of the

Requirements for the Degree of

Master of Science

in Communication Science and Disorders

at

The University of Wisconsin-Milwaukee

August 2021

ABSTRACT

SCHOOL-BASED AUGMENTATIVE AND ALTERNATIVE COMMUNICATION
COLLABORATION DURING COVID-19

by

Nicole Kocanda

The University of Wisconsin-Milwaukee, 2021
Under the Supervision of Shelley K. Lund, PhD

Purpose: The first purpose of this study was to describe the characteristics and procedures of successful AAC teams in schools. The second purpose was to explore how the COVID-19 pandemic affected the functioning of teams. **Methods:** Well-functioning teams completed an online survey about their team. **Results**: Results indicated there was no particular profile of what constituted a well-functioning team in this study. Results also indicated a significant change in meeting modality because of the COVID-19 pandemic. **Conclusion**: Participants discussed several procedures and characteristics of their well-functioning AAC team. AAC teams may consider implementing discussed procedures to improve their overall functioning.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

School-based Augmentative and Alternative Communication Collaboration During COVID-19

Introduction

Augmentative and alternative communication (AAC) refers to various devices, systems, strategies and tools that can replace or supplement natural speech. AAC often supports individuals who have communication deficits or breakdowns due to many reasons, including both congenital and acquired disorders. AAC includes common communication strategies such as gestures and facial expressions. It can also include no-technology options such as sign language, letter boards, or pictures. Lastly, it includes high-technology options such as speech generating devices. According to The American Speech-Language-Hearing Association (ASHA) Special Interested Division 12: Augmentative and Alternative Communication, AAC is defined as methods to "compensate for temporary or permanent impairments, activity limitations, and participation restrictions of individuals with severe disorders of speech-language production and/or comprehension, including spoken and written modes of communication" (2005, p.1).

Because of AAC's wide range of use from facial expressions to high-technology speech generating devices, individuals across the life span from pediatrics to geriatrics can benefit. A variety of acquired, temporary, and developmental disabilities/diagnosis may lead to one's need for AAC technology and services. Individuals with various disorders may benefit from AAC technology and intervention. Some common disorders include autism spectrum disorders (ASD), aphasia, cerebral palsy, dementia, head and neck cancers, brain injuries, Parkinson's disease, amyotrophic lateral sclerosis (ALS), and more (Elsahar, et al., 2019). When looking at using AAC with individuals with ASD,

a study by Ganz and colleagues (Ganz et al., 2012) found that AAC interventions are effective in promoting communication skills, social interaction skills, academic performance, and reducing challenging behaviors. For individuals with aphasia, AAC is found to facilitate language recovery and compensate for language deficits (Dietz et al., 2018). Overall, the goal of AAC is to allow individuals to efficiently and effectively engage in various interactions and participate in activities of their choice (Beukelman & Mirenda, 2012). Therefore, anyone who has difficulty in these areas can benefit from AAC.

It is difficult to estimate the prevalence of individuals with complex communication needs (CCN), therefore it is even more challenging to estimate the prevalence of individuals who use and can benefit from AAC. However, it is widely accepted that the number of AAC users is growing, due to various reasons. For example, the incidence of children with ASD has increased in recent years. In 2000, 1 in 150 children were diagnosed with ASD. More recently, in 2016, the incidence of children diagnosed with autism had increased to 1 in 54 children (CDC, 2020). Approximately 30-50% of children with ASD do not develop functional speech, and thus require AAC (National Research Council, 2001). Additionally, the incidence of cerebral palsy (CP) is also increasing, making it the most common motor disability in childhood (CDC, 2020). Approximately 95% of children with CP who have speech and/or language limitations would benefit from AAC and AAC intervention (Hustad & Miles, 2010). Additionally, due to advances in medical intervention, individuals with developmental and acquired disabilities have increased rates of survival. Many of these individuals have significant communication impairments, which also increases the prevalence of AAC users (Light &

McNaughton, 2012). Lastly, AAC is becoming more socially accepted, affordable, and accessible (McNaughton & Light, 2013). With AAC devices becoming more accessible, it is crucial to research the processes and outcomes involving devices to provide the best possible treatment to produce the most functional results.

Complex Needs of AAC Users

Those who use AAC often present with language deficits in several if not all language domains, making their communication and intervention needs complex. In a research review done by Binger & Light (2008), 31 studies were reviewed related to morphology and syntax of those who use AAC and had severe speech and physical impairments (SSPI). In order to qualify for this review, studies had to be primary research studies published in peer-review journal articles, dissertations, and/or book chapters published between 1985 and 2006. The studies must also have reported data pertaining to morphology and/or syntax, as well as included individuals with congenital SSPI or individuals who did not have disabilities but used aided AAC systems for research purposes. A wide variety of ages, developmental levels, and diagnoses were included in studies throughout this review, therefore there were few consistent patterns found across studies. One finding was that individuals using AAC with severe speech and physical deficits had difficulties with receptive and expressive grammar. Those who use AAC tend to use brief, grammatically incomplete messages to communicate. Even further, it was found that individuals who use AAC had difficulties constructing grammatically complete messages, both in conversation and situations where correct grammar was required (e.g., written communication). Those who use AAC are also at risk of producing shorter utterances when compared to peers their same age and/or

developmental level. One study found that four adolescents with cerebral palsy who used aided AAC produced an average of only two symbols when retelling a story (van Balkom & Donker-Gimbre`re, 1996). In comparison, when typically developing children are asked to use AAC to communicate, there is a developmental trend toward using longer messages. However, this trend was not found in those who are not typically developing and use AAC on a regular basis. When looking overall at morphology and syntax, it was found that those who use AAC can have difficulties in receptive grammar, receptive morphology, receptive syntax, expressive grammar, expressive morphology, and expressive syntax. However, results vary depending on age, diagnosis, and developmental level.

In a study done by Berninger and Gans (1986), researchers found that individuals who use AAC have deficits in language processing. Researchers administered standardized tests to assess individuals' ability to process oral language, process written language, and produce written language. Participants included a nonverbal adult with CP who used AAC, an adolescent with CP who had unintelligible speech, and a child with severe CP who used AAC. Researchers assessed oral language by assessing phonemic analysis, vocabulary knowledge, sentence interpretation, and discourse understanding. They evaluated written language by assessing the individuals' ability to decode single words and comprehend various types of sentences (i.e., phrases, simple active sentences, and compound sentences). Lastly, they assessed production of written language by assessing the individuals' ability to spell single words. Although performance varied from individual to individual, all three performed significantly lower in reading compared to their receptive oral language at the

4

discourse level, which suggests specific deficits in language processing for individuals who are nonverbal and use AAC.

In a study done by Senner (2011), researchers found that individuals who use AAC have deficits in pragmatic skills. Researchers provided a standardized assessment to 21 parents of teens and young adults who used AAC to assess their perception of their child's pragmatic skills. Researchers used the Pragmatics Profile from the Clinical Evaluation of Language Fundamentals (CELF-4) (Semel et. al, 2004). The Pragmatics Profile is a criterion-reference assessment designed "to identify verbal and nonverbal pragmatic deficits that may negatively influence social and academic communication" (Semel et al., 2004, p. 157 (as cited by Senner, 2011)). Parents rated 22 questions involving their children's pragmatics skills on a 4-point Likert scale. The four points were never, sometimes, often, and always. Of the 22 questions, 17 were rated as sometimes or never by majority of the parents. The outcomes of this study suggest that individuals who use AAC have deficits in pragmatic skills that require intervention.

Along with language difficulties, research suggests that many individuals who use AAC are nonliterate, and many others have difficulty with reading and writing skills when compared to their typically developing peers (Berninger & Gans, 1986; Koppenhaver & Yoder, 1992; Lund & Light, 2006). In fact, most students who use AAC do not become conventionally literate and few achieve literacy beyond the second-grade level (Koppenhaver & Yoder, 1992). It is necessary to understand and appreciate the importance of literacy in both education and everyday life. Literacy supports cognitive development, enhances learning, increases participation, and increases opportunities in social, academic, and professional contexts. When looking specifically

at those who use AAC, access to literacy can expand communication options. Rather than relying on symbols to express their language, they can use text based AAC systems to independently generate a sentence. In a study done by Vandervelden & Sigel (1999), researchers investigated the phonological processing and literacy skills of thirty-two participants with cerebral palsy and no intelligible speech who used AAC to communicate, as well as thirty-two participants with impaired but intelligible speech. The Peabody Picture Vocabulary Test – revised edition (PPVT-R) (Dunn & Dunn,1981) was used to make sure both groups were comparable in receptive vocabulary levels. This study assessed literacy and phonological processing skills by looking at three areas: retrieval of whole-word phonology, phoneme awareness, and phonological recoding. Within these areas, researchers investigated various tasks that related to each area (e.g., recognize sounds and letters, rhyme pictures, match word to print, spell words, recognize initial and final phonemes, recognize complex phonemes, speech to print matching). Results found that although the two groups were comparable in letter-sound recognition, the group of AAC users scored significantly lower in all three areas of phonological processing (phoneme awareness, phonological recording, and retrieval of whole-word phonology). Because literacy supports cognitive development, enhances learning, increases participation, and increases vocational, educational and social opportunities, it is crucial that service providers understand and address the complex literacy needs of those who use AAC.

Given the importance of literacy, it is important that those who use AAC are given adequate instruction in literacy areas. Because most students who use AAC do not become conventionally literate and few achieve literacy beyond the second-grade level

6

(Koppenhaver & Yoder, 1992), Sturm et al., (2006) provided an overview of reading instructions in first and third grade classrooms, as well as examined reading activities of general education students during primary grade instruction to highlight shifts in instruction between first and third grade. Researchers looked at critical, regular, and frequent literacy activities that help students learn to read, the central learning goals of these activities, and the activities that are central to literacy instruction programs. It was found that first grade teachers incorporated a wider range of activities in reading instruction than those who teach third grade. Additionally, third grade teachers focused more on text comprehension. Because students who use AAC may have limited literacy experience, it is important that students who use AAC continue to receive a wide variety of activities to engage in literacy learning. The biggest challenge found was teachers' lack of knowledge of curricula and supports to literacy learning for students who use AAC, so it is imperative that collaboration is occurring to best support these students.

Motor control and motor planning are important when using AAC because they allow the individual to gain access to the AAC device or produce the motor movements required for gestures or manual signs. For this reason, it is crucial to consider an individual's motor needs when planning and implementing AAC intervention. Those with neuromotor impairments may use their AAC devices while in a seated position in a wheelchair. If an individual is improperly seated and positioned, it can greatly affect their fatigue, comfort levels, and ability to move and attend to a task (Beukelman & Mirenda, 2013). For these reasons, it is important to collaborate with both occupational therapists (OTs) and physical therapists (PTs) to provide the best support for the student who

uses AAC. The complex needs of individuals who use AAC requires collaboration from a team of professionals with a range of expertise.

Education and Training in AAC

One factor that contributes to the importance of collaboration in AAC users is that many SLPs are not comfortable providing AAC services. Marvin et al., (2003) distributed a survey at ASHA's 2000 annual convention in Washington, DC to explore issues relating to experience with and education involving the use of AAC. The survey was provided to 71 SLPs and it found that many SLPs had poor training in AAC. Approximately 63% of surveyed SLPs reported a poor to limited comfort level in using AAC systems, and more than 80% reported fair to poor education in AAC. The majority of the SLPs surveyed also reported a strong wish for more preparation in the area of AAC at both the undergraduate and graduate level (Marvin et al., 2003). According to another survey study done by Johnson & Prebor (2019), 92% of respondents said an AAC course was required in their speech-language pathology graduate program and 8% reported it was not a requirement. It is important to consider that a total of 79 responses were received, and there were 279 speech-language pathology graduate training programs at the time of the study.

In a study done by Costigan & Light (2010), researchers reviewed preservice AAC training for speech-language pathologists (SLPs), special education teachers, and OTs to investigate the adequacy and effectiveness of current practice. To do so, researchers reviewed 15 studies about preservice AAC training. There were three classifications of studies included: (a) surveys completed by personnel at university preservice programs for SLPs, special education teachers, and OTs about their practice

in AAC training; (b) surveys completed by practicing professionals on their experiences with preservice AAC training; and (c) studies that evaluated the effectiveness of AAC training opportunities for SLPs, special education teachers, and OTs. Results indicated that the amount of AAC content offered by preservice SLP, special education, and OT programs was low. Preservice programs reported that only 1-4 hours of AAC content was included, typically infused into other courses. Along with lack of AAC content in preservice training, practicing professionals also indicated a lack of preservice training in AAC. Another barrier found in preservice programs was that faculty members in programs had limited expertise in the area of AAC. Lastly, the effectiveness of preservice training was unclear in all areas (i.e., SLP, OT, and special education). The results of this study raise concerns about preservice AAC training practices and procedures; therefore, school-related professionals may not have the knowledge and experiences to provide effective and adequate AAC intervention, which emphasizes the importance of collaboration across disciplines.

In another study done by Brady et al., (2007), the researchers reported on the curriculum and the extent of the curriculum of assistive technology (AT) and AT services for OTs, PTs, special education, and SLP programs. Unlike the previous study, this study included PT preparation. To do so, researchers sent out an electronic survey to program directors for OT, PT, special education, and SLP programs in the US. Of the 959 questionnaires that were sent out, 153 were returned. Results of the survey indicated that nearly all programs covered AT/AT services in their curriculum at some point. However, the time spent and emphasis on content was specific to their program type. For example, the PT programs were found to cover more about positioning and

mobility devices compared to other programs, and less about AAC devices. Considering the narrow emphasis that professionals may have on AT topics and services, it is important to collaborate when working with AT. This will broaden the scope of knowledge of the team and allow for the overall best fit intervention across all service providers.

School Based Collaboration

Types of Collaboration

Throughout the school year, more than 70,000 speech-language pathologists work with teachers, paraprofessionals, occupational therapists, and other school professionals to improve students' academic and communication skills (U.S. Department of Education, 2019). A team approach is essential to the success of any intervention; however, it is especially important for students who use AAC due to the complexity of their needs. There are various terms to describe different models of collaboration among school-based teams, and these terms are often used interchangeably without definition, leading to confusion. For purposes of this study, collaboration is defined as "a style for direct interaction between at least two coequal parties voluntarily engaged in shared decision making as they work toward a common goal" (Friend & Cook, 2013, p. 6, (as cited by Pfeiffer et al., 2019)). When looking at models of collaboration, there are three commonly used approaches: multidisciplinary, interdisciplinary, and transdisciplinary with a fourth approach gaining attention in research, interprofessional.

The multidisciplinary approach involves members of different disciplines, such as SLP, OT, PT, and special education, conducting their services independently, using their discipline specific skills and knowledge to address students' needs as they relate to their own specific disciplines (King-Sears et al., 2015). The team's efforts are not coordinated or integrated. For example, a student may have goals for both speech and fine motor skills, but the SLP would only address the speech goals and the OT would only address the fine motor goals. Communication regarding the student's progress on the goals would typically only occur during IEP meetings.

The interdisciplinary approach involves more coordination when planning assessment and treatment. Coordination of information and services is the primary goal of interdisciplinary services (Shapiro & Sayers, 2003). Team members perform assessment and treatment independently, however team members communicate more regularly about goals and goal progress. For example, the SLP and OT would still perform their therapy separately, however, there would be regular communication regarding the student's progress, instead of only at the IEP meeting.

In the transdisciplinary model, team members from different disciplines work together throughout all phases of intervention. Of the previous listed models, transdisciplinary is the most collaborative. In this model, the SLP and the OT would provide cotreatment, meaning they provide simultaneous treatment. During cotreatment, the SLP and OT would address all of the students' goals and would regularly meet to plan and debrief.

Lastly, the interprofessional approach combines interprofessional education with interprofessional collaborative practice. It involves professionals having collaborative

competencies in order to work on common goals to improve patient outcomes (Bridges et al., 2011). It also includes various aspects of the transdisciplinary model, such as providing simultaneous treatment.

Despite the importance of collaboration, it is not happening nearly enough in school settings. A study done by Pfeiffer et al., (2019) examined models of collaboration used by school-based SLPs and the factors that influence the models used. The participants were asked to respond to a survey on models of collaboration, which included the multidisciplinary, interdisciplinary, and interprofessional approaches. They were asked to indicate which approach aligned closest with what their school-based team used. The goal of the study was to determine potential factors and barriers that influenced collaboration, or lack of collaboration in school-based settings. The survey was sent out to 674 SLPs and 550 SLPs were willing to participate in the entire study and met the inclusion criteria. They found low percentages of school-based SLPs engaging in interprofessional collaboration. They found SLPs engaged in collaboration during initial evaluation (8%of the time), eligibility meetings (43%), and intervention sessions (14%). The top three barriers to collaboration identified were time constraints/scheduling, resistance from other professionals, and lack of support from employers (Pfeiffer et al., 2019).

Benefits and Barriers to Collaboration

Due to the complexity of AAC systems and individuals who use AAC, it is important that speech-language pathologists (SLPs) collaborate with occupational therapists (OT), special education teachers, and other school related professionals;

however, many school related professionals are unprepared to provide effective AAC assessment and intervention (Beukelman & Mirenda, 2012).

Paulsen (2008) acknowledged that successful collaboration can improve outcomes for students with disabilities. However, effective collaboration is not easy to accomplish, and requires hard work and adequate resources. Paulsen described several barriers that prevented effective collaboration, claiming the most obvious one to be lack of time available in a school day. It is difficult to find common times among the team members for planning. Another barrier mentioned was that teachers are trained to work with children and may have a difficult time working with adults, especially those who have different instructional strategies or philosophies. It may also be difficult for adults to change what they have been doing, as they may believe it is criticism on their current teaching strategies.

Markle et al., (2013) also described benefits of and barriers to effective collaboration. Benefits to collaboration in school-based teams included large positive impacts for individual students, teachers and other professionals, schools, and school districts. Student benefits included improved academic performance and behaviors, as well as reduced special education services. However, there were still many barriers to effective collaboration. These barriers included limited funding and resources, role disputes, disciplinary differences, and lack of time. With limited funding and resources, the team may have disagreements over how resources will be divided. With role disputes and disciplinary differences, team members may not understand how they can contribute to the team's efforts, or how their expertise may complement other team members' expertise. When this happens, disputes may occur when deciding who

should be responsible for what tasks. When looking at time constraints, it is important to consider the wide range of responsibilities that school-based staff are given. This leaves little time for collaboration.

Studies have also found that smaller caseloads often lead to more teaming. In 2018, the monthly caseload of a full-time ASHA-certified school-based SLP ranged from 3-145, with a median of 48 (ASHA, 2018). Larger caseloads often limit the time available for school-based professionals to collaborate, resulting in minimal collaboration. This negatively impacts students' progress, as students on smaller caseloads are more likely to make progress on functional communication measures compared to those on larger caseloads (Schooling, 2003).

As discussed earlier, individuals who use AAC are complex and tend to have various needs. Along with complex needs, it is also important to note that the process of AAC interventions, along with the intervention itself is often complex and challenging. AAC interventions include multiple components, including the development and customization of the AAC system; instruction for the individual who uses the system; instruction for facilitators in interaction to reduce barriers and support effective communication; and instruction for facilitators in operation, maintenance, and ongoing development of the AAC system (Light, 1999). Each one of these components include multiple procedures, making the intervention even more complex. Furthermore, AAC interventions are typically customized to meet the individual needs and preferences of the users.

Because students who use AAC tend to have more work needed in their intervention process, ASHA recommends that SLPs utilize a workload-based model for

managing caseload sizes, which grants extra workload to students using AAC. With that

information, SLPs with students who use AAC on their caseload should typically have a

smaller caseload due to the additional work involved in AAC treatment and serving

those with complex communication needs. However, this does not always happen -

resulting in less time for collaboration.

Effectiveness of Teams and Prediction of Success

The ultimate goal for any student receiving services is to allow for full

participation in general education environments and maximize success. For this reason,

it is necessary for professionals of the educational team to be coordinated and focused

on the provision of all educational resources and supports to attain that goal. Soto et al.,

(2001) implemented a focus group to identify necessary professional skills needed by

education team members to support students who use AAC in general education

classrooms. They asked the team members about their experience in successful

inclusion, barriers to inclusion, important skills needed for inclusion, and positive

outcomes associated with inclusion. The study found that collaboration was one of the

most important indicators of a successful inclusion program (Soto et al., 2001). Because

school-professionals have a shared goal of enabling students who use AAC to

communicate effectively and succeed in the classroom, it is crucial to communicate

regularly amongst school professionals. In a study done by Lund & Light (2007b), the

researchers found that teams who effectively collaborated were more likely to facilitate

positive outcomes. Researchers discovered this by interviewing seven young men

(ages 19-23) who used an AAC system for at least 15 years, as well as their family

members and professionals who had worked with them. The goal of the study was to

determine factors that positively and negatively contributed to outcomes for the group of AAC users. It was found that teams who effectively collaborated were more likely to facilitate positive outcomes. Lack of collaboration was mentioned by all families involved in the study, which was also the most frequent barrier to positive outcomes. Furthermore, many families described the positive effects of working with teams that communicated and collaborated regularly and effectively.

Effective Teams

Because of the importance that collaboration plays in promoting successful outcomes, it is necessary to know what makes an effective team. According to experts in collaborative teaming, an effective collaborative teaming process involves regular, positive face-to-face interactions; a structure for addressing the issues, performance and monitoring; and clear individual accountability for agreed-upon responsibilities (Nevin et al., 1990; Salisbury, Evans & Palombaro, 1997; Thousand & Villa, 1992; West & Idol, 1990). When looking specifically at AAC teams, Binger et al., (2012) developed an AAC Assessment Personnel Framework to help clarify professional roles and provide guidelines and suggestions for resolving assessment issues to help promote effective collaboration and promote successful outcomes. According to Binger et al., (2012), the first step in achieving successful AAC assessment outcomes is identifying who needs to be involved and what each individual's role is in the assessment process. Doing so helps team members understand their own, as well as other team members', responsibilities. It also allows team members to have the best fit role for their skills, interests, and expertise. Along with assigning roles, it is also important to identify

evidence-based practices and establish theoretical foundations for conducting AAC assessments.

COVID-19

According to the World Health Organization (WHO), COVID-19 was an infectious disease caused by a newly discovered coronavirus (World Health Organization, n.d.). This coronavirus was discovered at the end of 2019 and became a public health emergency of international concern in January of 2020. On April 16th, 2020, the WHO created guidelines in adjusting public health and social measures, such as "large-scale movement restrictions, commonly known as 'lockdowns'" in order to limit transmissions of COVID-19 and reduce deaths. With these lockdowns, several schools closed for extended periods of time, causing schools to resort to virtual learning. Because of virtual learning, professionals had limited physical contact with each other, forcing them to collaborate in a way that was likely different than they were used to.

According to American Physical Therapy Association (APTA), COVID-19 changed the landscape of telehealth in the field of physical therapy. In response, APTA developed a telehealth certificate for physical therapists to ensure excellent care via telehealth (American Physical Therapy Association, n.d.). Similarly, the American Occupational Therapy Association (AOTA) responded to the COVID-19 pandemic by advocating for coverage of telehealth services at the state and federal levels, provided information on telehealth and ethics, provided support, and researched how COVID-19 affected occupational therapists (American Occupational Therapy Association, 2020). ASHA began allowing SLPs to provide telehealth services in response to the spread of COVID-19. Additionally, ASHA provided SLPs with continuing education courses on

telepractice, as well as several setting-specific resources to assist with service delivery (American Speech and Hearing Association, n.d.).

The purpose of the study was two-fold. The first goal was to describe the characteristics and procedures of successful AAC teams in schools and determine specific tasks that schools, and school professionals should implement to establish effective collaboration. The second goal of this study was to explore how the COVID-19 pandemic affected the functioning of teams. Because of the complex needs of individuals who use AAC, many were at a higher risk of contracting COVID-19 and therefore chose to continue virtual instruction to mitigate their risk. Additionally, the changes to remote and hybrid instruction have changed the context of how teams function. It is important to understand how team functioning changed during the pandemic so we can learn from this situation and learn how to work in the future. The specific research questions for this study were "What are the characteristics of successful AAC teams in schools?", and "How has the COVID-19 pandemic affected the functioning of these teams?"

Methods

This research sought to explore school-based SLPs' perceptions of their AAC teams to describe the characteristics of well-functioning AAC teams.

Participants

Inclusion and Exclusion Criteria

Fifty-seven speech-language pathologists completed an initial screening survey to determine if they were part of well-functioning AAC teams. To be considered a well-

functioning AAC team and qualify for participation, participants had to have a raw score

of 97.5 or higher out of 130 on the Index of Interprofessional Team Collaboration for

Expanded School Mental Health (IITC-ESMH). According to previous research that

utilized the IITC-ESMH (Borg & Pålshaugen, 2019; Kelly at el., 2020), higher scores

represented more positive perspectives and experiences towards and with

interdisciplinary collaboration. The maximum raw score of the screening tool was 130,

so a raw score of 97.5 represents 75% of the maximum points available and an average

rating of 3.75 out of 5 on each item. This score was set as the minimum criteria for

participation and reflected a score of a "well-functioning" team.

Of the fifty-seven participants who completed the IITC-ESMH, twenty achieved

scores above 97.5 and qualified for full participation in the study (M = 107, range 98-

119). Thirty-seven individuals scored below 97.5 on the IITC-ESMH (M = 81.1; range

44-97) and were excluded from the study. The twenty participants who qualified for the

study were invited to complete the full survey about their teams' functioning prior to and

during the pandemic. All twenty individuals who were invited completed the survey.

Participants were also certified SLPs that worked in public schools, had students who

used AAC on their current caseload, worked in the US, and had a minimum of 3 years

of experience at their current school district. Exclusion criteria included individuals who

were not certified SLPs (e.g., SLPAs, OTs in an AAC team), SLPs who did not have

AAC users on their caseloads, SLPs who worked outside of the US, SLPs who did not

have 3+ years of experience at their current school district, and SLPs who were not a

part of an interprofessional IEP team.

Recruitment

Participants were recruited through a variety of means. Information on the study was posted on ASHA's Special Interest Group 12 (AAC) and Special Interest Group 16 (School-Based Issues), as well as the School SLP forum on ASHA community. Information on the study was also posted on several Facebook groups for SLPs, some which were specific to AAC (AAC for the SLP), and others that were related to the general practice (School-Based SLP). Vendor representatives (e.g., Tobii Dynavox) were contacted to forward the information to any school-based SLPs they believed were suitable for the study. Lastly, several AAC professors in the U.S. were notified about the survey and asked to forward the information to school-based SLPs they knew who worked in the area of AAC.

Measures

Team Functioning

The Index of Interprofessional Team Collaboration for Expanded School Mental Health (IITC-ESMH) (Mellin et al., 2010), presented in appendix A, was used as a screening tool to determine if the participants' teams could be defined as a "well-functioning" team. The IITC-ESMH was a reliable instrument for measuring interprofessional collaboration in the school setting. It was a 26-item scale with a four-factor model that measures the functioning of interprofessional teams. The participants used a 5-point Likert-type scale (1= never, 5= always) to rate the frequency of collaborative elements within their team. Reverse scoring was utilized on negatively worded items (see appendix A for specific items).

Effect of COVID-19 on Team Functioning

Survey Development. The survey titled "*Speech-Language Pathologists perspective on the functioning of their AAC teams: exploring pre- and post- COVID-19*" was developed for this study (see Appendix B). Previous research about AAC and team functioning was consulted to develop the preliminary questions for this survey (Beukelman, Ball, & Fager, 2008; Lund et al., 2017). Additionally, *Internet, Phone, Mail, And Mixed-Mode Survey – the Tailored Design Method* (Dilman et al., 2014) was used to formulate the order and phrasing of survey questions.

The first draft of the survey contained 30 questions designed to gather information about the participants' perspectives on their AAC teams. A variety of question types were used within the survey including multiple choice and open-ended free response questions.

The first section of the survey was used to obtain information about the SLP including demographic information, characteristics of their caseload, and their training in AAC. The second section obtained information about the AAC team. The third section obtained information on the functioning of the team including team meetings, how they occurred, and what they consisted of.

Section one explored information regarding demographics, caseload, and AAC experience. Demographic data was included to determine the SLPs experience involving AAC. Demographic data was included in the beginning of the survey because according to a study done by Teclaw et al. (2012), placing demographic data at the beginning of a survey can increase the rate of response for demographic items without affecting the responses of non-demographic items. Participants were asked to rate their

AAC experience using categories developed by Beukelman et al. (2008) and identify

themselves as a general practice clinician, an AAC intervention specialist, or AAC

expert. According to Beukelman, et al. (2008), these are the three different types of SLP

AAC intervention providers. According to Beukelman, et al. (2008), a general practice

clinician was a clinician in integrated or general practice who provided a range of clinical

services as part of their daily practice, including AAC intervention. However, they did not

specialize in AAC intervention services. AAC intervention specialists were those

professionals who provided direct AAC intervention services to people with complex

communication needs for at least 50% of their workload. As defined by Beukelman, et

al. (2008) these professionals must possess expertise on AAC intervention so they can

provide unique intervention services that others (i.e., general practice clinicians) are not

able to offer. An AAC expert typically focused their efforts on developing and

maintaining the knowledge, technical, financial, policy and service bases of the AAC

field. Their perception of themselves may influence the functioning of their team.

The participants were asked how many years of AAC experience they had as

well as what types of training or education they had in AAC. The participants' training

and experience in AAC was an important variable to document because the education

SLPs receive in AAC varies tremendously (Beukelman et al., 2008).

Section two of the survey explored the members of the AAC team and their roles

in the team. The first question regarding an AAC team specialist was asked because

according to Beukelman et al. (2005), AAC specialists were those who lead and consult

with the AAC team. They bring AAC expertise to the teaming process, which likely

improves the overall functioning of the team. It was important to look at this during this

study to determine if having an AAC team specialist is an indicator of a high-functioning team.

The second section also explored the different members of the AAC team and their role in meetings. According to Beukelman et al. (2005), there were different classifications of team members and the expectations of them in regard to the AAC users. The three classifications that were explored are regular AAC team members, occasional AAC team members, and specific AAC team members. Regular AAC team members were those who served regularly on AAC teams. They included AAC specialists and those who served on AAC teams and school professionals who served on AAC teams, like SLPs, special education teachers, and occupational therapists. Occasional AAC team members served occasionally on AAC teams, for example, when the student is under their care. This included regular education teachers and nurses. Specific AAC team members were those who support individuals who use AAC, but likely did not serve on other AAC teams. They included the individual who uses AAC and their family.

Section three explored the teams' functioning and asked questions about their meeting procedures, communication strategies, and other practices prior to and during the pandemic. There were 17 total questions in this section, 10 were multiple choice and 7 were open ended questions. The participants responded to each question about team practices twice, first regarding how they functioned pre-COVID 19 and then post-COVID-19. The questions were sequenced this way because it is often easier for survey takers to retrieve the necessary information surrounding a topic before moving on to a new topic that requires them to think about new information (Dillman et al., 2014).

Survey Validation. To ensure that the content of the survey was valid, two current professionals in the field of speech-language pathology and/or assistive technology reviewed the survey questions and provided feedback. One professional was an SLP who worked as an AAC intervention specialist, while the second one was an SLP who worked as an AAC expert. Survey validation is an important step in survey design (Dillman et al., 2014). The professionals were asked to provide feedback on the content of the questions to determine if the areas discussed are important to the research questions. They were asked to look at the overall questions to determine if any information was left out. They were also asked to analyze the wording of the questions to determine if the questions' wording made logical sense. The feedback from the reviewers is summarized below, and the survey was adjusted accordingly for its final form.

Survey reviewers suggested adding a question involving family participation, as they noticed an increase in family participation in their practice as result of the COVID-19 pandemic. Minor wording changes were suggested as well. The final survey is found in appendix B.

Procedures

The survey was administered online using the Qualtrics online survey system. A web-based questionnaire was used for two reasons. First, due to the global pandemic of COVID-19, there were limited opportunities to distribute the survey. Second, the use of online questionnaires was both cost and time effective.

Once individuals indicated an interest and willingness to participate in the study, they were sent an email with a unique link to the consent documentation and the IITC-

ESMH screening questionnaire. The results obtained from the IITC-ESMH screener were analyzed using a raw score cut off.

Data Analysis and Scoring

Results obtained from the survey were analyzed in several ways due to the variety of the questions. For the first research question ("what are the characteristics of successful AAC teams in schools?"), descriptive statistics were used to analyze results obtained from the survey. This process involved looking at the mean and range of the SLP's demographic information, such as years of experience and caseload size. Proportion data was also used to reflect some items (e.g., 75% of the teams had an AAC specialist).

For the second research question ("how has the pandemic affected the functioning of these teams?"), Chi-squared tests were used determine if there was a significant difference between the responses to the questions about team practice prior to and during the pandemic. Chi-squared analyses were performed to compare responses prior to and during the pandemic for the following questions: "how often did you meet with related professionals?"; "how did you meet?"; "how often did meetings have an agenda?";; "how often does did your team share student progress?";; and "how often did you adjust your treatment based on other team members ideas/goals?"; The number of responses for each multiple choice question was tabulated to run the Chi-squared analyses. Statistical Package for the Social Science (version 27) was used to analyze the data using Chi-squared analysis. These analyses allowed us to reject or accept the hypothesis for each question.

Narrative responses to any questions were analyzed using qualitative procedures. Qualitative coding procedures were used to identify key themes to determine any significant features of successful teams. Coding procedures were adapted from Strauss (1987). Each response was organized into broad themes based on the general content of the response. Within each theme, the responses were narrowly coded with regard to the specific content. Lastly, the codes were reviewed and then organized into major and sub-themes.

Results

The purpose of this study was two-fold. The first goal was to describe characteristics and procedures of successful AAC teams in schools to determine specific tasks that school professionals should implement in order to establish more effective collaboration and improve team functioning. The second goal was to explore how the COVID-19 pandemic affected the performance of school-based AAC teams. The specific research questions for this study were "What are the characteristics of successful AAC teams in schools?", and "How has the pandemic affected the functioning of these teams?"

Response Rate

Individuals who participated in this study first completed a screening tool that was designed to assess team functioning. The instrument was a 5-point Likert scale tool with 26 questions. Participants rated their teams in the following areas: interdependence, newly created professional activities, collective ownership of goals, and reflection on process.

Twenty participants completed the initial screening tool and qualified to participate in the study. These participants were invited to complete the full survey about their teams' functioning prior to and during the pandemic. All twenty individuals who were invited completed the survey (response rate=100%).

Characteristic of the SLPs

Grades served

A majority of participants reported working with multiple age groups of children (i.e., preschool, elementary school, junior high, and high school). In fact, only 30% (n=6) of participants reported working with only one age group. Of the 20 participants, five SLPs reported working with all four age groups, five reported working with three age groups and four reported working with two age groups. Of the overall 20 participants, 10 reported working with preschool aged children, 10 reported working with elementary students, 10 reported working with junior high students, and 10 reported working with high school students.

Time Spent as an SLP

Across the 20 participants, the average amount of time spent practicing as an SLP was 14.42 years, with a standard deviation (SD) of 8.97. The minimum was 3 years of experience and the maximum was 30 years of experience. The average amount of time spent in the school setting was 11.98 years across the 20 participants with a SD of 6.89 years. The minimum was 3 years, and the maximum was 25 years. The average amount of time spent providing AAC services was 11.97 years with a SD of 7.36. The minimum was 3 years, and the maximum was 28 years. 95% of the participants (n=19)

worked full time at 30-40+ hours per week, while 5% (n=1) worked part time at 20-29 hours per week.

Caseload

The average caseload size of the 20 SLPs was 47.10 students with a SD of 31.40. The minimum caseload size was 13 students, and the maximum was 150 students. The participant with 150 students held a consultant role as an AAC specialist, meaning they did not provide direct services to all 150 students. The average number of students who use AAC on each SLP's caseload was 18.8 students with a SD of 32.20. The minimum number of students who use AAC on the caseload was 13 students, while the maximum was 150 students.

AAC training

The 20 participants reported various training regarding AAC. The participants could choose all that applied, as well as report any other trainings they participated in that were not listed. The results are presented in Table 1. Almost all participants (19/20) reported learning from in-service workshops or seminars and reading AAC literature. Seventeen participants reported that they received training from school district staff and fifteen participants reported receiving training from an AAC company representative. Fourteen participants reported that they took university courses in AAC, the majority of whom (12) took an in-person course. Two participants reported taking a university online course. No participants reported receiving training through individual contact with university/college staff (e.g., participating in a college professor's research lab). Eight participants listed other methods of learning AAC, which included conferences (3 participants), hands-on experience, Facebook groups, blogs, etc., listserve discussion,

Preparing Adolescent with Autism for Adult Life (PAAL) seminar/retreat with Bruce

Baker in Pittsburgh, trial and error, and training from colleagues.

Table 1. Number of responses for types AAC training

Type of training	Number of participants
In-service workshops/seminars	19
Reading AAC literature	19
School district staff	17
Company representative	15
University in person course	12
University online course	2
Individual contact with University staff	0
Other	8

Defining Themselves

Of the 20 participants who responded, 70% (n=14) of participants considered

themselves to be general practice clinicians, meaning they do not specialize in AAC

intervention services, but they provide treatment to individuals who use AAC. Twenty

percent (n=4) of the participants considered themselves to be AAC intervention

specialists, which means they spend at least 50% of their clinical workload providing

direct services (e.g., assessment, instruction, funding assistance, and follow-up) to

individuals who use AAC. Ten percent (n=2) of participants considered themselves to

be AAC experts, meaning they focused on developing and maintaining the knowledge,

technical, policy, and service bases of the AAC field.

Team Characteristics

AAC Intervention Specialist

Participants were asked if their team had an AAC intervention specialist to

consult with. Although participants did not specify who held the AAC specialist role, the

position is most frequently held by a SLP. Of the 20 participants, 65% (n=13) of participants reported that an AAC intervention specialist consulted with their team, 10% (n=2) of participants reported that an AAC intervention specialist did not consult with their team, and 25% (n=5) reported that they were an AAC intervention specialist. Overall, 90% of participants reported that an AAC intervention specialist was part of their AAC team. The two participants who reported not having an AAC intervention specialist considered themselves general practice SLPs.

Team Members

Participants were asked to identify members of their regular, occasional, and specific AAC team based on Beukelman et al.'s (2005) definitions. According to Beukelman et al. (2005), a regular AAC team member serves regularly on AAC teams, which typically includes professionals such as the SLP and special education teachers. An occasional AAC team member serves occasionally on AAC teams and often includes general education teachers and nurses. Specific AAC team members are those that support specific individuals who use AAC and likely do not serve on other AAC teams. They often include the family of the individual who uses AAC.

When participants were answering this question, they often reported the same professionals in multiple categories. For example, one participant said the special education teacher was a regular, occasional, and specific team member. Another participant reported that a general education teacher was a regular, occasional, and specific team member, as well. There were several instances of multiple entries similar to this, likely indicating that participants were confused by this question. For this reason, answers were combined to look at the overall members of an AAC team.

The 20 participants reported various members that were part of their AAC team. The participants could choose all that applied, as well as report any other members that were not listed. Figure 1 represents the frequency of each member that was reported. All participants (20/20) reported that a special education teacher was part of their team. Almost all participants (19/20) reported a paraprofessional as part of their team. Sixteen participants reported an AAC specialist as part of their team, seventeen reported an occupational therapist, and fifteen reported a general education teacher. Fourteen participants reported a physical therapist was part of their team, and eleven reported a school psychologist. Less than half (9/20) of participants reported a nurse as part of their team. The following members were listed as other members of participants' teams: caregiver, parent, outside therapists, social worker, job coach, Board Certified Behavior Analyst (BCBA), behaviorist, Teacher of Students with Visual Impairments (TVI), Teacher of the Deaf (TOD), school administrators, serving SLP, student's family, admin, AT specialist, student, nanny, person using AAC and home health nursing staff.
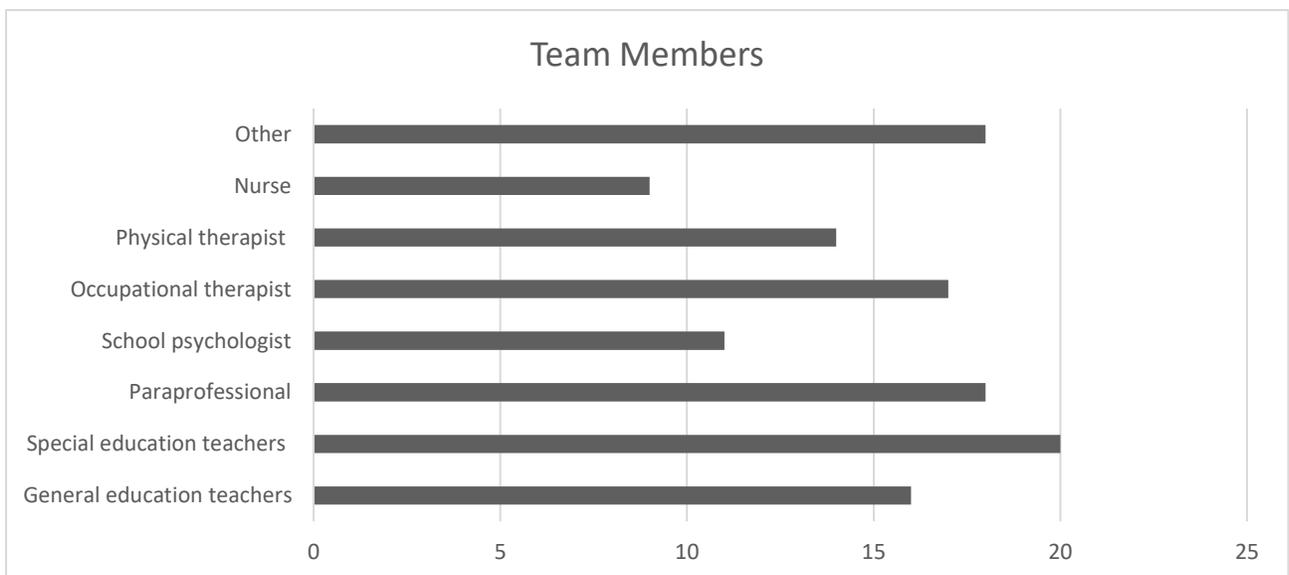
Figure 1. Number of respondents for each professional on an AAC team

Effect of Covid-19 on Team Functioning

Meeting Frequency

Participants were asked how often they met with team members prior to the pandemic and during the pandemic. The options were: daily, weekly, monthly, when requested, at IEP meetings, and other. Table 2 shows the frequency of responses in each category. An Omnibus Pearson chi-squared analysis was performed to determine if there were differences in the distribution of meeting frequency before the COVID-19 pandemic and during the COVID-19 pandemic. There was no significant relationship between meeting frequency in the different conditions, X^2 (4, *N*= 40)= 2.94. p=0.567.

Table 2. Number of participant responses for each meeting frequency prior to the COVID-19 pandemic and during the COVID-19 Pandemic

Frequency	Prior to COVID-19 pandemic	During the COVID-19 pandemic
Daily	4	1
Weekly	10	10
Monthly	1	3
When requested	3	4
At IEP meetings	2	2

Meeting Modes

Participants were asked how their team meetings occurred prior to the pandemic and during the pandemic. The options were as follows: email, video call, phone call, in person meetings, scheduled meetings, unscheduled meetings, and other. Table 3 shows the frequency of responses in each category. An Omnibus Pearson chi-squared analysis was performed to determine if there were differences in the modes of meeting before the COVID-19 pandemic and during the COVID-19 pandemic. The relationship between these variables was significant, X^2 (6, *N*=150) = 27.34. p=0.00 Results

indicated that there was a statistically significant difference in the distribution of meeting modes.

Table 3. Number of participant responses for each meeting mode prior to the COVID-19 pandemic and during the COVID-19 pandemic

Modes	Prior to COVID-19 pandemic	During the COVID-19 pandemic
E-mail	14	14
Video call	1	19
Phone call	5	10
In person meeting	19	7
Scheduled meeting	18	18
Unscheduled meeting	15	8

To determine which differences were statistically significant, an adjusted standardized residual analysis with Bonferroni correction was used to reduce familywise error rate. According to Gignac (2019), family error rate is the chances of concluding erroneously that a statistically significant effect has been observed across a series of statistical analyses on the same sample of data. Table 4 presents the adjusted residuals, X^2 value, p-value, and adjusted p-value with Bonferroni correction for each condition. The results indicated that there was a statistically significant difference for the number of participants who reported using in-person meetings (p= .03468) and video calls (p=.00025) prior to and during the pandemic.

Table 4. Residual analysis of meeting modes

	Adjusted Residual	Chi-square	p-value	Adj p-value
Email	.23	.05	.81809	5.72664
In-person	-2.81	7.90	.00495	.03468*
Other	1.37	1.88	.17069	1.19481
Phone call	1.20	1.44	.23014	1.61098
Scheduled meetings	-.28	.08	.77948	5.45634
Unscheduled meetings	-1.8	3.24	.07186	.50302
Video call	4.13	17.06	.00004	.00025*

Note: * = statistically significant difference

Meeting Agenda

Participants were asked how often their team meetings had an agenda prior to and during the pandemic. Options were as follows: all the time, most of the time, sometimes, and never. Table 5 shows the frequency of responses in each category. An Omnibus Pearson chi-squared analysis was performed to determine if there were differences in the distribution of meetings having an agenda before the COVID-19 pandemic and during the COVID-19 pandemic. The results indicated that there was no significant relationship between meeting agendas in the different conditions, X^2 (2, N= 40)= 4.43. p=0.109

Table 5. Number of participant responses for each agenda frequency prior to the COVID-19 pandemic and during the COVID-19 pandemic

Frequency	Prior to COVID-19 pandemic	During the COVID-19
All of the time	2	3
Most of the time	6	12
Sometimes	11	5
Never	0	0

Sharing Progress

When asked about how often they shared student progress with other team members prior to the pandemic and during the pandemic, participants were given the following options: daily, weekly, monthly, when requested, at IEP meetings, and other. Table 6 shows the frequency of responses in each category. An Omnibus Pearson chi-squared analysis was performed to determine if there were differences in the distribution of sharing student's progress before the COVID-19 pandemic and during the COVID-19 pandemic. The results indicated that there was no significant relationship

between the frequency of sharing progress in the different conditions, X^2 (5, N= 40)=

4.76. p=0.446.

Table 6. Number of participant responses for frequency of progress sharing prior to the COVID-19 pandemic and during the COVID-19 pandemic

Frequency	Prior to COVID-19 pandemic	During the COVID-19
Daily	4	0
Weekly	6	8
Monthly	3	4
When requested	5	5
At IEP meetings	1	1
Other	1	2

Adjusting Treatment

Participants were asked how often they adjusted treatment based on other team

member's ideas/goals prior to the pandemic and during the pandemic. The options were

as follows: daily, weekly, monthly, rarely, never, and other. Table 7 shows the frequency

of responses in each category. An Omnibus Pearson chi-squared analysis was

performed to determine if there were differences in the distribution of adjusting

treatment based on other team member's ideas and goals before the COVID-19

pandemic and during the COVID-19 pandemic. The results indicated that there were no

differences in the expected value from different conditions. There was no significant

relationship between adjusting treatment in the different conditions, X^2 (3, N= 40)= 0.94.

p=0.815.

Table 7. Number of participant responses for adjusting treatment prior to the COVID-19 pandemic and during the COVID-19 pandemic

Frequency	Prior to COVID-19 pandemic	During the COVID-19
Daily	4	0
Weekly	6	8
Monthly	3	4
Rarely	5	5
Never	1	1
Other	1	2

Open Ended Responses

Participants were asked eight open ended questions about their team and their team's functioning throughout the pandemic. Responses were analyzed using coding procedures adapted from Strauss (1987). The results are reported below.

Addressing Conflict

Participants were asked to discuss the ways in which they addressed conflict within their AAC team. The major themes and subthemes are presented in table 8, as well as the number of occurrences of subtheme. Three major themes emerged from the data: team meetings, education, and having a good team dynamic. There were three subthemes within the major theme of team meetings, which were having discussions, AAC/AT member comes in, and creating plans. There were two subthemes within the major theme of education, which were research and staff training. There were two subthemes within the major theme of having good team dynamic, which were good relationships and compromise/flexibility.

Table 8. Major themes and subthemes represented in the data and the number of comments coded for each category for addressing conflict.

Major Theme	Sub-Theme	Number of Comments
Team meetings	Team discussions	15
	AAC team member	3
	Identify the issue	4
	Create a plan	4
	SLP decides	3
Education	Research	3
	Staff training	5
Good relationships	Having good relationships	3
	Compromise	3

Team discussions. This category consisted of comments related to specific things that occurred during team meetings to address conflict. There were 15 different mentions of having meetings, making it the most frequently discussed way to address conflict. Within these meetings, participants reported having specialty AAC/AT members come in. One participant said, "we usually consult with a member of the AAC team", while another said they seek "consultation of our AT team leads." There were four instances of participants reporting that their team identified the issue in the meeting. There were also four discussions that involved teams creating a plan to address the conflict. One participant said their team "sets up a plan identifying which professions are going to address each task." Lastly, there were three instances of participants reporting that the SLP was the main professional that addressed conflict related to AAC. One participant said the "SLP generally is considered the final determiner", and another said team members "[they] reach out to me (the SLP) to problem solve."

Education. Participants reported learning the importance of education regarding AAC. This was discussed on five occurrences, where participants said team members "benefit from training on the AAC", and "on-going education for all members is

important." Along with this, participants also mentioned the importance of educating

parents. One participant said they will "provide teachers and families with more initial

education and/or handouts on using the device", while another said they will "include

parent more regularly for trainings, discussions, etc." Participants also reported using

research to address conflict, where participants said their team "refers to journal

articles" and their team "researches solutions together".

Good Relationships. Participants reported addressing conflict by having good

relationships. There were three instances of participants discussing good relationships

among their team. One participant said, "our team has built good relationships…when

you train and learn together, I think it opens up a certain open and honest work

relationship." Participants also reported addressing conflict by compromising among

their team. There were three instances of participants discussing compromise and

flexibility. One participant mentioned her team "finds a compromise that incorporates

best practice", while another said her team "tries to meet in the middle."

Collaboration during the pandemic

Participants were asked to discuss the ways in which the pandemic affected their

ability to collaborate with school-based professionals. The major themes and

subthemes are presented in table 9, as well as the number of occurrences of each

subtheme. Three major themes emerged from the data: it improved, it was worse, and it

was not affected. There were four subthemes within the major theme of improved

collaboration which were organized meetings, more collaboration, positive experiences

with virtual meetings, and an increase in discussing students. There were three

subthemes within the major theme of worse, which were timing, access, and difficulty meeting.

Table 9. Major themes and subthemes represented in the data and the number of comments coded for each category about the ability to collaborate during the COVID-19 pandemic

Major theme	Sub-theme	Number of comments
Improved	Organized meetings	2
	More collaboration	6
	Positive experiences	3
	Increase in Discussion Students	2
No change	No effect	3
Worsened	Timing difficulties	3
	Limited access to devices	1
	Difficulty meeting	4

Organized meetings. Participants reported that during the pandemic, their team had more organized meetings. There were two occurrences of this, where participations said their meetings "now typically have an agenda" and their team "now organized weekly team meetings."

More collaboration. Participants reported more collaboration during the pandemic. There were six instances of participants discussing more collaboration. One participant said the pandemic "increased our ability to collaborate since we are just a Zoom meeting away, saving precious time in busy schedules", while another said that during the pandemic "my teams are talking, problem-solving, and collaborating more than they were prior to the pandemic."

Positive experiences virtually. Participants also reported having positive experiences with virtual meetings. There were three instances of participants discussing positive experiences with virtual meetings. One participant said, "the school feels as if

Zoom has been great" while another said, "parent participation and involvement has improved significantly [via video call or email]."

Increase in discussing students. Participants also reported discussing students more throughout the pandemic. There were two instances of participants discussing this, where participants said they now "discuss each student on the team at least monthly", while another said they "share specific success and concerns."

No change. There were three participants that reported no change in their ability to collaborate during the pandemic, in which they responded, "it really hasn't", "it hasn't affected it much", and "it hasn't."

Timing. Participants reported the pandemic had negatively affected their ability to collaborate due to timing. There were three instances of participants discussing timing. One participant said, "it is difficult to find time to meet or get questions answered in a collaborative way" and another said, "everyone has less time and scheduling collaborations is challenging."

Access to devices. Participants also reported having difficulty with accessing devices during collaborative meetings, making it more difficult to collaborate. There was one instance of this, where the participant said they are "currently not able to trial different devices/systems (during AAC assessments) with students".

Difficulty meeting. Participants reported having difficulty finding time to meet during the pandemic, due to things like not being able to "just pop in their office" during the pandemic. There were four occurrences of this. For example, one participant said, "being in person, I am able to consult with team members daily when I see them in passing, picking up my students from their classroom, or providing push-in services."

Team Functioning in the Future

Participants were asked to discuss what they learned about their team that will affect the future. The major themes and subthemes are presented in table 10, as well as the number of occurrences of subtheme. Two major themes emerged from the data: the importance of collaboration, and specific strategies to implement. There were two subthemes within the major theme of importance of collaboration: communication and flexibility. There were three subthemes within the major theme of strategies to implement: team roles, ways to collaborate, and education.

Table 10. Major themes and subthemes represented in the data and the number of comments coded for each category about what participants learned during the COVID-19 pandemic

Major theme	Sub-theme	Number of comments
Importance of collaboration	Communication	5
	Flexibility	3
Strategies	Team roles	4
	Ways to collaborate	5
	Education	5

Communication. Participants discussed that they have learned the importance of communication. Communication was discussed on five occurrences, where participants discussed various aspects of communication as it affects their team. One participant said, "building trust is the best way to get team members on board", while another said "multiple brains are better than one. Working together will only help out students succeed."

Flexibility. Participants also discussed the importance of flexibility. Flexibility was discussed on three instances, where participants said their team was "working on being flexible with one another, always." Another participant discussed the importance of

making sure meetings were scheduled at times when the whole team was available, because "previously, therapists would touch base and meet in offices."

Team roles. Participants discussed the importance of having team roles included and specified in their future collaborations. There were four instances of participants discussing team roles. For example, one participant said their team believes they "should collaborate with school teams with a coaching frame of mind, rather than embracing the 'expert' model." Another participant mentioned the importance of having the paraprofessional in team meetings, "who in the past have not always been included in planning."

Ways to collaborate. Participants also discussed ways to collaborate. Various collaboration ways were discussed on five occurrences. One participant mentioned they will "continue to meet however we need to", while another mentioned their team will "utilize video calls/chats to include team members who can't be physically present." Another participant mentioned they learned the importance of having "scheduled and unscheduled time for meeting, consulting, and collaborating."

Education. Participants reported learning the importance of education regarding AAC. This was discussed on five occurrences, where participants said team members "benefit from training on the AAC", and "on-going education for all members is important." Along with this, participants also mentioned the importance of educating parents. One participant said they will "provide teachers and families with more initial education and/or handouts on using the device", while another said they will "include parent more regularly for trainings, discussions, etc."

Family Participation during COVID-19

Participants were asked to discuss the ways in which their practice changed during COVID-19 to include direct family participation when implementing AAC. The major themes and subthemes are presented in table 11, as well as the number of occurrences of subtheme. Two major themes emerged from the data: more family involvement, and it has been difficult. There were three major subthemes in family involvement: increased participation, providing education and increased comfort with the device.

Table 11. Major themes and subthemes represented in the data and the number of comments coded for each category for how their practice changed to include families during the COVID-19 pandemic

Major theme	Sub-theme	Number of comments
More family involvement	Increased participation	15
	Providing education	15
	Increased comfort	5
It has been difficult	Difficult	3

Increased participation. Participants reported there had been an increase in family participation throughout the pandemic. There were 15 mentions of an increase in family participation. One participant said, "one of the big silver linings of this pandemic has definitely been increased parent communication and overall involvement." Another participant said, "family has been a part of each lesson" while another said, "I got to work directly with families."

Providing education. Participants discussed providing education to families throughout the pandemic. Participants reported parent coaching and modeling on several occurrences. There were 15 comments about providing education. One participant said they "provided parent coaching via video calls to help them learn how to navigate their student's specific devices," while another said, "we have realized that we

need to increase the amount of parent training and coaching to support use and understand AAC use in the home." Another participant reported their team was "putting together more AAC training tools, specific to families."

Increased comfort with the device. Participants reported that families have become more comfortable with their child's device through the pandemic. This was discussed on five occurrences. Participants reported that during the pandemic, "it was amazing to see the buy in from parents." Another participant said, "as families become more comfortable with vocabulary, they have really embraced AAC."

Difficult. A few participants reported having difficulty including family participation during the pandemic, which was discussed on three instances. One participant said, "it is so hard to provide services for AAC virtually, while another said, "some families have given up on the device during the pandemic."

Team Strengths

Participants were asked to discuss the strengths of their AAC team. Three major themes emerged from the data: specific characteristics, good collaboration, and priority on the student. The major themes and subthemes are presented in table 12, as well as the number of occurrences of subtheme. There were four subthemes that emerged from specific characteristics: personal characteristics, trust, long relationships and communication skills. There two three subthemes that emerged from good collaboration: collaboration and team leader. There were no subthemes for focus on the student.

Table 12. Major themes and subthemes represented in the data and the number of discussions for each category for strengths of team

Major theme	Sub-theme	Number of comments
Specific characteristics	Personal characteristics	15
	Trust	4
	Long relationships	1
	Communication	9
Good collaboration	Collaboration	8
	Team leader	1
Focus on the student		9

Personal characteristics. Various personal characteristics were discussed by the participants. The following characteristics were reported: kind, vulnerable, respectful, devoted, hardworking, eager to learn, relentless, motivated, willing to work together, open to new ideas, and good at problem solving.

Trust. Several participants reported trust as a strength of their team. Trust was reported on four instances, as illustrated by the following quote "[the team] has trust in each other's knowledge and skills."

Long relationships. One participant reported that working together for a long time was a strength of their team. This participant said, "we have all worked together for a long time."

Communication. Participants reported that their team has good communication, which was discussed on nine occurrences. Participants reported their team was "excellent at communicating prior to formal meetings" and team members are "in communication with me to let me know how the student is using the device and what updated vocabulary they may need." Another participant said, "our teams are good at listening to others' perspectives."

Collaboration. Participants reported that they have good collaboration procedures, which was discussed on eight occurrences. Participants reported using a "teamwork approach" as well as "role release." Another participant said their team "incorporates each other's goals into our sessions, if possible."

Team leader. One participant mentioned having a team leader as a strength of their team. This participant said having an "AAC consultant allows for a team 'leader', which is helpful."

Focus on the student. Participants reported that having a focus on the student was a strength of their team. This was discussed on nine instances. One participant mentioned their team was "willing to push for what's best for our students even when we become annoying to others", while another said their team was "committed to helping out students." Another participant mentioned their team has a "focus on the whole child.", while another said their team has a "focus on the whole child."

Biggest Challenges

Participants were asked to discuss the biggest challenges that they faced with their team overall. The major themes and subthemes are presented in table 13, as well as the number of occurrences of subtheme. Three major themes emerged from the data: time, difficulty with AAC knowledge, and general challenges. There were two subthemes that emerged from time, including lack of time and difficulty meeting. There were four subthemes that emerged from difficulty with AAC knowledge: buy in, carry over, staff concerns, and family concerns/requests. There were three subthemes that emerged from general challenges: technology problems, different expectations, and behavioral challenges.

Table 13. Major themes and subthemes represented in the data and the number of discussions for each category about challenges faced with their team.

Major theme	Sub-theme	Number of comments
Time	Lack of time	9
	Difficulty meeting	2
Difficulty with AAC knowledge	Buy in	3
	Carry over	4
	Staff concerns	4
	Family concerns	6
General Challenges	Technology troubles	2
	Different expectations	2
	Behavioral challenges	4

Time related. Participants reported time related challenges on nine occurrences. Participants reported "time constrains" and "time, time, time." One participation said they have difficulty with "time to stay educated ourselves re: new AAC tools, time to educate and support parents, time to effectively train students on use of their device as well as their school support people." Another participant said, "everyone has extremely busy schedules managing in person and virtual students."

Difficulty with meeting. Participants reported having difficulty with meetings involving their teams. This was discussed on two occurrences, where participants said, "it's hard to make sure everyone on our very large team is on the same page", while another said they have difficulty "being able to meet as a team in person."

Buy in. Participants reported buy-in as a challenge within their team. This was discussed on three occurrences. One participant said there isn't always "complete buy-in from building administration or general/special education classroom teachers." Another said it was hard to "get others to recognize the importance of having easily

accessible AAC throughout learning environments", while another said they struggle

with "getting parent buy in."

Carry over. Participants reported having difficulty with carry over on four

occurrences. One participant said they struggle to "receive follow through from the

home environment" and "struggle to engage family." Another participant said they wish

they could "model how to use the devices with students in the classroom."

Staff concerns. Participants reported having concerns with staff on four

occurrences. These concerns related to education, where one participant said they

have challenges when their team has "a special education teacher who does not have

an education background and doesn't 'get it.'" Another participant reported concerns

regarding "onboarding new staff." One participant expressed challenges as it relates to

staff turnover, in which they said, "The other challenge is frequent turnover of some

team members."

Family concerns. Participants reported family challenges on six occurrences.

These challenges related to "balancing parent goals/desires", and "keeping up with

parent requests." One participant said parents "often want the child to talk and

sometimes are not happy when we use AAC."

Technology concerns. Participants reported challenges with overall technology

concerns on two occurrences. One participant mentioned having difficulty with "keeping

devices charged", while another reported "equipment/technology problems."

Different expectations. Participants reported challenges related to expectations on

two occurrences. One participant reported having difficulty balancing parents' goals with

"realistic expectations", while another said they have difficulty with "different expectations for different specialists/team members from administration."

Behavioral challenges. Participants reported challenges related to behaviors on four occurrences. One participant reported difficulty "keeping up with student needs", while another reported challenges in "managing with aggressive behaviors when in person." One participant reported challenges related to attendance, saying "when students do not attend synchronous sessions."

Changing collaboration in the future

Participants were asked to discuss any changes they would make to the way their team collaborates in the future. The major themes and subthemes are presented in table 14, as well as the number of occurrences of subtheme. Two major themes emerged from the data: more meetings and meeting procedures. Three subthemes emerged from the major theme more meetings: collaboration, education, and co-treatment. Three subthemes emerged from meeting procedures: general procedures, dedicated positions, and time.

Table 14. Major themes and subthemes represented in the data and the number of discussions for each category for addressing conflict.

Major themes	Sub-themes	Number of comments
More meetings	Collaboration	9
	Education	5
	Co-treatment	1
Meeting procedures	General procedures	5
	Dedicated positions	3
	Time	9

Collaboration. Participants reported wanting more collaboration in the future. This was discussed on nine instances. Participants reported wanting to see "more

collaboration" and "more regular, informal, whole team meetings." Another participant said they would "love if we could meet a little more." Two participants also reported wanting more collaboration as it relates to goals. One participant said they would "love to see more collaboration on goal development", while another said collaboration would "make for some really great goals especially related to literacy."

Education. Participants reported wanting more education in the future, which was discussed on five instances. Participants discussed wanting education for themselves, as well as the opportunity to educate others on the team. Participants requested wanting to "add more training for all special education teachers on AAC", as well as more time to "train support staff." Additionally, one participant said they wish that "everyone could share their expertise".

Co-treatment. One participant reported wanting more co-treatment, saying "it would be great if we could co-treat more. Unfortunately, there isn't always the ability to do that."

Dedicated positions. Participants reported wanting more dedicated positions within their team. There were three instances of participants discussion this. One participation said they would "like to see our team have dedicated positions on the team. As it stands now, we each carry a caseload'. Another participant said they would "like to see specifically trained teams in each school building with coaching from an AT/AAC specialist."

General procedures. Participants reported wanting general procedures to change, such as modes of meetings and time frames of meeting. This was discussed on five instances. One participant said they would like the "ability to meet more frequently for

shorter amounts of time (weekly 15-minute meetings vs monthly 30-minute meetings)."

Another said they want "more agendas for meetings", while another one said they would

like to include "the paraprofessionals more often."

Time. Participants discussed wanting more time on nine instances, saying things

like "more time", "I wish we had more time to meet", and "more dedicated team time."

One participant said that "with additional time, we would like to spend more time

working with teachers."

Discussion

Team Characteristics

Twenty school-based SLPs who were members of "well-functioning" AAC teams

completed an on-line survey about their team's characteristics and procedures. The

results of the study indicated there was no particular profile of what constituted a well-

functioning team. The SLPs that were part of well-functioning teams served all age

groups. They also had a wide range of years of experience and wide variation in

caseload size. Lastly, participants had various types of experience with AAC with

various AAC trainings.

According to the survey results, SLPs that were part of well-functioning AAC

teams worked with all age groups from preschool up until high school, implying that

grades served did not determine a well-functioning team. Similarly, the time spent

practicing as an SLP varied, which indicated that experience did not predict a well-

functioning team. SLPs with 3 years of experience can be part of a well-functioning

team, as can those with 30 years of experience. The amount of time spent in the school

setting and spent providing AAC services were similar, implying that a specific amount

of experience in the school setting or experience providing AAC services was not required to be part of a well-functioning team.

The caseload size across participants varied with an average of 47.1 students. According to ASHA (2018), the average caseload size of a school based SLP was 48 students which is similar to the average result in this study. ASHA recommends that SLPs with students who use AAC on their caseload should have a smaller caseload due to additional work required when serving students who use AAC. Interestingly, the participants in this study did not have reduced caseloads compared to the national average. Even though these SLPs had students who use AAC on their caseload and a near average size caseload according to ASHA, participants were still able to be part of a well-functioning team. This implies that being part of a well-functioning team may have allowed them to have a larger caseload because their team worked well together.

Participants reported a wide range of AAC training. Of the 20 participants, 95% reported receiving AAC training by reading AAC literature, making it the highest form of AAC training. This suggests that reading AAC literature is important to be part of a well-functioning AAC team. Doing so can help SLPs stay up to date on new theories, intervention and assessment methods, and other information related to AAC to bring to their team. However, according to Pierce-Goldstein & Culp (2021), there are several barriers that school-based clinicians may face when trying to keep up with research, including fees, lack of confidence in research-specific tasks, lack of professional development focusing on research, and lack of support from school districts. Although these barriers have been cited as preventing many SLPs from accessing literature, it did not appear to be a problem for the participants in this study.

Another common method that participants reported to receive AAC training was in-service workshops and/or seminars. 95% of participants reported receiving AAC training from in-service workshops and/or seminars, 85% of participants reported receiving AAC training from school district staff, 75% of participants reported receiving training from company representative, and 70% of participants reported training from a graduate level (online or in person) course. This indicates that it was important to have entry-level training in a graduate program, but it was also important to supplement that knowledge with in-service training, reading the literature, and receiving training from school district staff and company representatives. According to Douglas et al., (2020), there are several gaps in preservice and in-service training for AAC practitioners, so it is important that SLPs supplement their preservice training with in-service training as discussed. Doing so may assist in improving overall team functioning.

The data from this survey reflects that SLPs do not need to be AAC experts or AAC intervention specialists to be part of a well-functioning AAC team. The majority of participants (70%) considered themselves general practice clinicians, meaning they did not specialize in AAC, but were still part of a well-functioning AAC team. However, as discussed above, a majority of participants reported various training involving AAC. This suggests that despite being general practice clinicians, SLPs that were a part of well-functioning teams received AAC training from various sources. Additionally, 90% of the participants' teams included an AAC specialist, so including a specialist on an AAC team may increase overall team functioning. According to Beukelman et al. (2005), AAC experts bring AAC expertise to the teaming process, which can improve the overall team functioning.

The data from this survey indicated that there are various team members involved in a well-functioning AAC team, including AAC specialists, general education teachers, special education teachers, paraprofessionals, school psychologists, occupational therapists, physical therapists, nurses, caregivers, parents, outside therapists, social workers, job coaches, BACBA, behaviorist, and more. However, 80% of participants reported an AAC specialist was part of their AAC team. This implies that having an AAC specialist may be an indicator of a high-functioning AAC team. According to Binger et al. (2012), the primary role of an AAC specialist may include AAC evaluations, AAC device selections, completing funding reports, providing AAC technical support, AAC clinical implementations and AAC troubleshooting. AAC specialists have expertise in AAC and obtain more ongoing AAC professional training, allowing them to provide the best support to the AAC team. The AAC specialist works alongside the general practice SLP, whose role may include case management, facilitating AAC decision-making, AAC clinician implementation, and AAC troubleshooting. It is important to note that by definition, general practice SLPs do not have advanced training in AAC. However, participants in this study considered themselves as general practice SLPs, despite having extensive in-service training in AAC.

Team Procedures

Addressing conflict. Addressing conflict is an important part of team functioning. According to Mellin et al. (2010), well-functioning teams address conflicts directly with each other. Results from this survey suggest that well-functioning teams also have team meetings to address conflict. Of the 20 participants, 75% reported addressing conflict by

having a team meeting (i.e., directly with each other). Within these meetings, the team may have discussions, have an AAC team member coming in, identify the issue, create a plan, and/or have the SLP decide the ultimate solution. These methods are also supported in research as a successful way to resolve conflict. According to Behfar et al. (2008), top performing teams/groups explicitly discuss rationale behind decisions and assign work to team members who have relevant task expertise. In terms of AAC teams, participants reported explicitly identifying the issue and creating a concrete plan. Additionally, participants reported assigning work to a team member that specializes in AAC or SLP, as they are likely the most knowledgeable in the area of AAC. Participants also reported addressing conflict with education, including research and staff training. This suggests that when conflicts arise, team members that are part of well-functioning team may also use education to solve the conflict.

COVID-19 and Team Functioning

When looking at how the pandemic affected collaboration, participants said it improved, worsened, or there was no change. Six participants reported more collaboration during the pandemic, often due to the convenience of virtual meetings. Two participants stated their meetings were more organized, demonstrated by having an agenda or occurring weekly. Although the analyses regarding meeting frequency or use of agendas were not statistically significant in the multiple-choice section, it is important to acknowledge that two participants reported this change in the open-ended responses. According to Nancarrow et al. (2013), who researched principles of good interdisciplinary teams, having a clear direction and vision for teams is a key principle of good teaming. Going forward, professionals may consider scheduling weekly meetings

with an agenda with clear directions to improve collaboration. Along with this, participants also reported virtual meetings improved collaboration, so professionals may also consider continuing/implementing virtual collaboration meetings to promote collaboration.

Not surprisingly, there was a significant change in meeting modes before the pandemic and during the pandemic. Prior to the pandemic, in person meetings were the most frequently reported meeting mode. However, due to the COVID-19 pandemic and widespread lock downs, in person meetings were deemed unsafe by the Center of Disease Control (CDC). Because of this, there was a decrease in in-person meetings and an increase in the use of video meetings. Prior to the pandemic, teams were not consistently using video meetings as a meeting mode. Although the modes of meeting changed, the frequency of meetings did not change. This implied that the well-functioning teams were flexible throughout the pandemic, providing support to the claim that teams need to be flexible in order to be a successful team. As stated by Driskell et al. (2006), flexibility is a powerful and relevant characteristic for successful teams, as it allows teams to problem solve in various situations. In this case, flexibility allowed well-functioning teams to problem solve their meeting mode in a global pandemic.

Scheduled vs unscheduled meetings. When asked what participants learned about their team during the pandemic that will affect the future, several participants discussed specific strategies to implement. One participant learned the importance of having both scheduled and unscheduled time for collaborating. Additionally, another participant reported learning the importance of scheduling meetings when the whole team is available, rather than having collaborative discussions in shared office spaces,

in the hallway, or during student drop offs. Discussions in shared office spaces and

hallways likely restrict other team members from being involved, therefore it is crucial to

designate meeting times when the whole team is available. According to Beukelman &

Mirenda (2012), supporting teachers and paraprofessionals in the classroom can

promote social communication for the student who uses AAC. Additionally, including

teachers and paraprofessionals in collaborative discussions can give the SLP insight

into the student's AAC use and difficulties in the classroom. Because there are benefits

to both discussions, it is important to designate time for both.

On the other hand, several participants reported difficulty with collaboration

during the pandemic due to lack of direct contact, such as passing by team members in

the hall, picking up and dropping off students, and/or during push-in therapy. Because

these things were not occurring as often, if at all, during the pandemic, they were unable

to collaborate as effectively. Another participant reported the pandemic negatively

affecting their ability to collaborate due to outside staff not being allowed in buildings,

which is especially limited for AAC assessments because they were unable to trial

different devices and systems. These difficulties support the idea of having designated

time for both scheduled and unscheduled meetings.

Family participation. Several participants discussed increased family participation

during the pandemic due to virtual meetings and increased communication. One

participant discussed providing parent coaching during the pandemic via video calls to

help the parents learn the device, which then increased the family's comfort with the

device. With all this additional education provided throughout the pandemic, participants

reported families having increased comfort and buy-in with AAC devices. To increase

parent's comfort with AAC devices, it is important to provide parents with this education. However, parent education may become difficult in the future compared to during the pandemic as students return to in person school and parents return to work. Going forward, one participant reported their team will put together more AAC training tools specific to families. Another participant reported that she will create a family support group to offer to parents. In a family support group, family members may be invited to discuss difficulties they are facing and receive guidance from the SLP. The SLP could also provide specific strategies that encourage communication with a device at home. According to Kent-Walsh et al., (2015), providing partner instruction on the communication of individuals using AAC was found to have positive effects on the communication performance of individuals who use AAC. The most frequently targeted communication skills were aided AAC modeling, expectant delay, and open-ended question asking. Activities included in the teaching of these skills were providing a descriptive overview, instructor modeling, guided practice, and role play. When providing support to families of children who use AAC, SLPs should include these strategies and skills.

   Time. Several participants brought up the issue of time on various questions, including questions regarding changes to the future, biggest challenges with collaboration, and biggest challenges within the pandemic. Multiple participants reported difficulty with collaboration during the pandemic related to time, because additional responsibilities related to the pandemic made time even more limited. Multiple participants also reported the biggest challenge their team faced involved time, stating things like it was difficult to stay educated, address parent concerns, complete

paperwork, and collaborate. When looking at changes for the future, several participants also reported wanting more time to collaborate. According to Pfeiffer et al., (2019), time is one of the top three barriers to collaboration, so it is unsurprising that time came up frequently. However, time is a limited commodity. Despite the desire for more time, participants were able to be successful with the time they had and were part of well-functioning teams. Overall, while even well-functioning teams report a desire for more time to collaborate, it appears as these participants have learned to work well with the resources they do have.

Discussion Summary

SLPs who wish to achieve better functioning for their AAC team may consider implementing the following procedures based on the results from this survey:

- Seek out various types of AAC training, including but not limited to reading AAC literature, participating in-service workshops and/or seminars, and receiving training from AAC company representatives.

- Address conflict relayed to AAC directly with team by having team meetings and seeking out and/or providing education

- Scheduling weekly meetings with an agenda to collaborate

- Implement virtual meetings to allow all team members to participate in collaborative discussions

- Promote family collaboration with family support groups and/or AAC training tools specific to families

Limitations

The results of this study are based on a small number of speech-language pathologists and only reflect the experiences of these participants and may not generalize to other groups. The participants did not disclose the culture or ethnicity of themselves or their students. Therefore, cultural differences were not captured. The participants were not from a random sample. Instead, they were self-selected, that is they contacted researchers in response to advertisements about the study. This means they may have had an interest in the topic which may skew results. Participants were oriented to AAC school-based teams based on recruitment procedures and the wording of questions. However, we cannot be certain that they were answering with only their AAC team in mind (i.e., not other school-based teams). The survey was also completed in April and May of 2021. At this point in the pandemic, the participants may or may not have returned to school fully or in a hybrid mode as there were different COVID-19 precautions and procedures across districts and states. Additionally, the goal of the study was to look at characteristics of well-functioning teams, therefore it may not represent what is commonly encountered by teams that are not considered well-functioning. More than half of the participants that expressed interest in the study did not qualify as a well-functioning team, indicating that there are likely more teams that are not well-functioning than those that are. Furthermore, without a comparison group of teams that are not considered well-functioning, we can't determine if the characteristics are unique to teams that are considered well-functioning. Lastly, the study was not experimental, so no cause and effect can be determined. These factors affect the generalizability of the results.

Conclusions and Future Directions

The results of this study identified characteristics and procedures of well-functioning AAC teams in the school setting. It also explored how COVID-19 affected their team functioning. The results provided information on procedures that AAC teams in the school setting can implement to achieve better functioning collaboration. Going forward, future research should look at a larger, random sample to investigate how common or uncommon it is to have a well-functioning team. Future research is also needed on characteristics and procedures of AAC teams that are not well-functioning to identify areas in which other teams struggle. This information can be compared with this study to determine differences between well-functioning teams and teams that are not well functioning. Future research is also needed to explore how well-functioning teams are successful with the time they have. Time was a frequently discussed barrier by well-functioning teams; however, they have learned to be successful with the time they have. Research should also investigate how successful AAC teams use their time and why they seem to be more effective with their time, despite the desire for more time. Lastly, because keeping up with research appeared important in being part of a well-functioning team, future research is needed to investigate how SLPs access literature. Doing so can describe strategies to assist school based SLPs in accessing current literature.

Collaboration is important in facilitating positive outcomes for students who use AAC; therefore, it is crucial that AAC teams prioritize effective collaboration. However, there are several barriers to effective collaboration, so it is important to continue to research skills, procedures, and characteristics of teams that are well-functioning and

teams that are not. This will allow for all teams to learn the skills of effective

collaboration and implement them into their practice to facilitate improved services and

outcomes for children who use AAC

References

A Message From AOTA on COVID-19. aota.org. (2020, March 19). https://www.aota.org/Publications-News/AOTANews/2020/Leadership-Statement-Coronavirus-COVID19.aspx.

American Speech-Language-Hearing Association. (2018). 2018 Schools survey. Survey summary report: Numbers and types of responses, SLPs. Available from www.asha.org.

Behfar, K. J., Peterson, R. S., Mannix, E. A., & Trochim, W. M. K. (2008). The Critical Role of Conflict Resolution in Teams: A Close Look at the Links Between Conflict Type, Conflict Management Strategies, and Team Outcomes. *Journal of Applied Psychology*, *93*(1), 170–188. https://doi.org/10.1037/0021-9010.93.1.170

Berninger, V. W., & Gans, B. (1986). Language profiles in nonspeaking individuals of normal intelligence with severe cerebral palsy. *Augmentative and Alternative Communication*, *2*(2), 45–50. https://doi.org/10.1080/07434618612331273880

Beukelman, D. R., & Mirenda, P. (2012). *Augmentative and alternative communication: Supporting children and adults with complex communication needs* (4th ed). Paul H. Brookes Pub.

Beukelman, D. R., Ball, L. J., & Fager, S. (2008). An AAC Personnel Framework: Adults with Acquired Complex Communication Needs. *Augmentative and Alternative Communication*, *24*(3), 255–267. https://doi.org/10.1080/07434610802388477

Beukelman, D. R., Hanson, E., Hiatt, E., Fager, S., & Bilyeu, D. (2005). AAC Technology Learning Part 3: Regular AAC Team Members. *Augmentative and Alternative Communication*, *21*(3), 187–194. https://doi.org/10.1080/07434610400006638

Binger, C., Ball, L., Dietz, A., Kent-Walsh, J., Lasker, J., Lund, S., McKelvey, M., & Quach, W. (2012). Personnel Roles in the AAC Assessment Process. *Augmentative and Alternative Communication*, *28*(4), 278–288. https://doi.org/10.3109/07434618.2012.716079

Binger, C., & Light, J. (2008). The Morphology and Syntax of Individuals who use AAC: Research Review and Implications for Effective Practice. *Augmentative and Alternative Communication*, *24*(2), 123–138. https://doi.org/10.1080/07434610701830587

Borg, E., & Pålshaugen, Ø. (2019). Promoting Students' Mental Health: A Study of Inter-professional Team Collaboration Functioning in Norwegian Schools. *School Mental Health*, *11*(3), 476–488. https://doi.org/10.1007/s12310-018-9289-9

Brady, R., Long, T. M., Richards, J., & Vallin, T. (2007). Assistive technology curriculum structure and content in professional preparation service provider training programs. *Journal of Allied Health*, *36*(4), 183–192.

Bridges, D. R., Davidson, R. A., Soule Odegard, P., Maki, I. V., & Tomkowiak, J. (2011). Interprofessional collaboration: Three best PRACTICE models of interprofessional education. *Medical Education Online*, *16*(1), 6035. https://doi.org/10.3402/meo.v16i0.6035

Centers for Disease Control and Prevention. (2020, September 25). *Data & Statistics on Autism Spectrum Disorder*. Centers for Disease Control and Prevention. https://www.cdc.gov/ncbddd/autism/data.html.

Centers for Disease Control and Prevention. (2020, December 31). *Data and Statistics for Cerebral Palsy*. Centers for Disease Control and Prevention. https://www.cdc.gov/ncbddd/cp/data.html.

Costigan, F. A., & Light, J. (2010). A Review of Preservice Training in Augmentative and Alternative Communication for Speech-Language Pathologists, Special Education Teachers, and Occupational Therapists. *Assistive Technology*, *22*(4), 200–212. https://doi.org/10.1080/10400435.2010.492774

Dietz, A., Vannest, J., Maloney, T., Altaye, M., Holland, S., & Szaflarski, J. P. (2018). The feasibility of improving discourse in people with aphasia through AAC: Clinical and functional MRI correlates. *Aphasiology*, *32*(6), 693–719. https://doi.org/10.1080/02687038.2018.1447641

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, phone, mail, and mixed-mode surveys: The tailored design method* (4th edition). Wiley.

Douglas, S. N., West, P., & Kammes, R. (2020). The Training Experiences of Augmentative and Alternative Communication Practitioners in One Midwestern State. *Perspectives of the ASHA Special Interest Groups*, *5*(1), 219–230. https://doi.org/10.1044/2019_pers-19-00053

Driskell, J. E., Goodwin, G. F., Salas, E., & O'Shea, P. G. (2006). What Makes a Good Team Player? Personality and Team Effectiveness. *Group Dynamics*, *10*(4), 249–271. https://doi.org/10.1037/1089-2699.10.4.249

Dunn, L., & Dunn, L. (1981). Peabody Picture Vocabulary Test Revised. Circle Pines, MN: American Guidance Service.

Elsahar, Y., Hu, S., Bouazza-Marouf, K., Kerr, D., & Mansor, A. (2019). Augmentative and Alternative Communication (AAC) Advances: A Review of Configurations for Individuals with a Speech Disability. *Sensors, 19*(8), 1911. https://doi.org/10.3390/s19081911

Friend, M. P., & Cook, L. (2013). *Interactions: Collaboration skills for school professionals* (7th ed). Pearson.

Ganz, J. B., Earles-Vollrath, T. L., Heath, A. K., Parker, R. I., Rispoli, M. J., & Duran, J. B. (2012a). A Meta-Analysis of Single Case Research Studies on Aided Augmentative and Alternative Communication Systems with Individuals with Autism Spectrum Disorders. *Journal of Autism and Developmental Disorders*, *42*(1), 60–74. https://doi.org/10.1007/s10803-011-1212-2

Ganz, J. B., Earles-Vollrath, T. L., Heath, A. K., Parker, R. I., Rispoli, M. J., & Duran, J. B. (2012b). A Meta-Analysis of Single Case Research Studies on Aided Augmentative and Alternative Communication Systems with Individuals with Autism Spectrum Disorders. *Journal of Autism and Developmental Disorders*, *42*(1), 60–74. https://doi.org/10.1007/s10803-011-1212-2

Gignac, G. E. (2019). How2statsbook (Online Edition 1). Perth, Australia

Hustad, K. C., & Miles, L. K. (2010). Alignment between Augmentative and Alternative Communication Needs and School-Based Speech-Language Services Provided to Young Children with Cerebral Palsy. *Early Childhood Services (San Diego, Calif.)*, *4*(3), 129–140.

Thousand, J., & Villa, R. (n.d.). *Collaborative teams: A powerful tool in school restructing.*

Johnson, R. K., & Prebor, J. (2019). Update on Preservice Training in Augmentative and Alternative Communication for Speech-Language Pathologists. *American Journal of Speech-Language Pathology*, *28*(2), 536–549. https://doi.org/10.1044/2018_AJSLP-18-0004

Kelly, P. L., Heyman, J. C., Tice-Brown, D., & White-Ryan, L. (2020). Interprofessional practice: Social Work STUDENTS' perspectives on collaboration. *Social Work in Health Care, 59*(2), 108-121. doi:10.1080/00981389.2020.1719565

Kent-Walsh, J., Murza, K. A., Malani, M. D., & Binger, C. (2015). Effects of Communication Partner Instruction on the Communication of Individuals using AAC: A Meta-Analysis. *Augmentative and Alternative Communication*, *31*(4), 271–284. https://doi.org/10.3109/07434618.2015.1052153

King-Sears, M. E., Janney, R., & Snell, M. E. (2015). *Collaborative teaming* (Third Edition). Paul H. Brookes Publishing Co.

Koppenhaver, DA & Yoder, DE. (1992). Literacy issues in persons with severe speech and physical impairments. *Issues and Research in Special Education*.

Light, J. (1999). Do augmentative and alternative communication interventions really make a difference?: The challenges of efficacy research. *Augmentative and Alternative Communication*, *15*(1), 13–24. https://doi.org/10.1080/07434619912331278535

Light, J., & McNaughton, D. (2012). The Changing Face of Augmentative and Alternative Communication: Past, Present, and Future Challenges. *Augmentative and Alternative Communication*, *28*(4), 197–204. https://doi.org/10.3109/07434618.2012.737024

Lund, S. K., & Light, J. (2007a). Long-term outcomes for individuals who use augmentative and alternative communication: Part II – communicative interaction. *Augmentative and Alternative Communication*, *23*(1), 1–15. https://doi.org/10.1080/07434610600720442

Lund, S. K., & Light, J. (2007b). Long-term outcomes for individuals who use augmentative and alternative communication: Part III – contributing factors. *Augmentative and Alternative Communication*, *23*(4), 323–335. https://doi.org/10.1080/02656730701189123

Lund, S. K., Quach, W., Weissling, K., McKelvey, M., & Dietz, A. (2017). Assessment With Children Who Need Augmentative and Alternative Communication (AAC): Clinical Decisions of AAC Specialists. *Language, Speech, and Hearing Services in Schools*, *48*(1), 56–68. https://doi.org/10.1044/2016_LSHSS-15-0086

Markle, R. S., Splett, J. W., Maras, M. A., & Weston, K. J. (2013). Effective School Teams: Benefits, Barriers, and Best Practices. In M. D. Weist, N. A. Lever, C. P. Bradshaw, & J. S. Owens (Eds.), *Handbook of School Mental Health* (pp. 59–73). Springer US. https://doi.org/10.1007/978-1-4614-7624-5_5

Marvin, L. A., Montano, J. J., Fusco, L. M., & Gould, E. P. (2003). Speech-Language Pathologists' Perceptions of Their Training and Experience in Using Alternative and Augmentative Communication. *Contemporary Issues in Communication Science and Disorders*, *30*(Spring), 76–83. https://doi.org/10.1044/cicsd_30_S_76

McNaughton, D., & Light, J. (2013). The iPad and Mobile Technology Revolution: Benefits and Challenges for Individuals who require Augmentative and Alternative Communication. *Augmentative and Alternative Communication*, *29*(2), 107–116. https://doi.org/10.3109/07434618.2013.784930

Mellin, E. A., Bronstein, L., Anderson-Butcher, D., Amorose, A. J., Ball, A., & Green, J. (2010). Measuring interprofessional team collaboration in expanded school mental health: Model refinement and scale development. *Journal of Interprofessional Care*, *24*(5), 514–523. https://doi.org/10.3109/13561821003624622

Nancarrow, S. A., Booth, A., Ariss, S., Smith, T., Enderby, P., & Roots, A. (2013). Ten principles of good interdisciplinary team work. *Human Resources for Health*, *11*(1), 19–19. https://doi.org/10.1186/1478-4491-11-19

National Research Council. *Educating children with autism.* Washington DC: NRC; 2001.

Nevin, A. I., Thousand, J. S., Paolucci-Whitcomb, P., & Villa, R. A. (1990). Collaborative consultation: Empowering public school personnel to provide heterogeneous school for all. Journal of Educational and Psychological Consultation, 1, 41-67.

Paulsen, K. J. (2008). School-Based Collaboration: An Introduction to the Collaboration Column. *Intervention in School and Clinic*, *43*(5), 313–315. https://doi.org/10.1177/1053451208314494

Pfeiffer, D. L., Pavelko, S. L., Hahs-Vaughn, D. L., & Dudding, C. C. (2019). A National Survey of Speech-Language Pathologists' Engagement in Interprofessional Collaborative Practice in Schools: Identifying Predictive Factors and Barriers to Implementation. *Language, Speech, and Hearing Services in Schools*, *50*(4), 639–655. https://doi.org/10.1044/2019_LSHSS-18-0100

Pierce-Goldstein, L., & Culp, M. E. (2021). Want to conduct research in your school? Here's how. *Want to Conduct Research in Your School? Here's How*. https://doi.org/10.1044/leader.scm.26062021.32

Salisbury, C. U., Evans, I. M., & Palombaro, M. M. (1997). Collaborative Problem-Solving to Promote the Inclusion of Young Children with Significant Disabilities in Primary Grades. *Exceptional Children*, *63*(2), 195–209. https://doi.org/10.1177/001440299706300204

Semel, E., Wiig, E. H., & Secord, W. A. (2004). Clinical Evalua-tion of Language Fundamentals (4th ed.). Boston, MA: Pearson.

Senner, J. E. (2011). Parent Perceptions of Pragmatic Skills in Teens and Young Adults Using AAC. *Communication Disorders Quarterly*, *32*(2), 103–108. https://doi.org/10.1177/1525740109351570

Shapiro, D. R., & Sayers, L. K. (2003). Who Does What on the Interdisciplinary Team: Regarding Physical Education for Students with Disabilities? *TEACHING Exceptional Children*, *35*(6), 32–38. https://doi.org/10.1177/004005990303500605

Soto, G., Müller, E., Hunt, P., & Goetz, L. (2001). Critical issues in the inclusion of students who use augmentative and alternative communication: An educational

team perspective. *Augmentative and Alternative Communication*, *17*(2), 62–72. https://doi.org/10.1080/aac.17.2.62.72

Special interest Division 12 Issues, ACTIVITIES, & outcomes. (1997). *Perspectives on Augmentative and Alternative Communication*, *6*(1), 16–16. https://doi.org/10.1044/aac6.1.16-a

Strauss, A. L. (1987). *Qualitative analysis for social scientists.* Cambridge University Press. https://doi.org/10.1017/CBO9780511557842

Sturm, J. M., Spadorcia, S. A., Cunningham, J. W., Cali, K. S., Staples, A., Erickson, K., Yoder, D. E., & Koppenhaver, D. A. (2006). What happens to reading between first and third grade? Implications for students who use AAC. *Augmentative and Alternative Communication*, *22*(1), 21–36. https://doi.org/10.1080/07434610500243826

Teclaw, R., Price, M. C., & Osatuke, K. (2012). Demographic Question Placement: Effect on Item Response Rates and Means of a Veterans Health Administration Survey. *Journal of Business and Psychology*, *27*(3), 281–290. https://doi.org/10.1007/s10869-011-9249-y

Telehealth in Practice. APTA. (n.d.). https://www.apta.org/your-practice/practice-models-and-settings/telehealth-practice.

U.S. Department of Education, Home | U.S. Department of Education. (n.d.). https://www.ed.gov/.

Schooling, T. (2003). Lessons from the National Outcomes Measurement System (NOMS). *Seminars in Speech and Language*, *24*(3), 245–256. https://doi.org/10.1055/s-2003-42827

van Balkom, & Donker-Gimbrère. (1996). A psycholinguistic approach to graphic language use. *Augmentative and Alternative Communication: European Perspectives*.

Vandervelden, M., & Siegel, L. (1999). Phonological processing and literacy in AAC users and students with motor speech impairments. *Augmentative and Alternative Communication*, *15*(3), 191–211. https://doi.org/10.1080/07434619912331278725

Weist, M. D., Lever, N. A., Bradshaw, C. P., & Owens, J. S. (2014). *Handbook of School Mental Health Research, Training, Practice, and Policy*. Springer US : Imprint : Springer. https://doi.org/10.1007/978-1-4614-7624-5

West, J. F., & Idol, L. (1990). Collaborative Consultation in the Education of Mildly Handicapped and At-Risk Students. *Remedial and Special Education*, *11*(1), 22–31. https://doi.org/10.1177/074193259001100105

World Health Organization. (n.d.). *Timeline: WHO's COVID-19 response*. World Health Organization. https://www.who.int/emergencies/diseases/novel-coronavirus-2019/interactive-timeline.

Appendices

Appendix A: The Index of Interprofessional Team Collaboration for Expanded

School Mental Health

1. Team members discuss strategies to improve their working relationship.

2. The team works together to resolve problems among members.

3. The team incorporates feedback about its process to strengthen its effectiveness.

4. The team informally and/or formally evaluates how they work together.

5. Team members talk about similarities and differences among their professional roles in working with youth.

6. Members of the team address conflicts with each other directly.

7. The team discusses the degree to which each professional should be involved with a particular youth.

8. Team members talk about ways to involve additional professionals with various expertise in the team.

9. **There are ''turf'' issues among members of the team. ***

10. **The team does not welcome new ideas about how to help youth. ***

11. Team members respect one another even when they have different ideas about how to help youth.

12. The team has appropriate expectations of the roles of members in supporting youth.

13. The team respects the opinion and input of each member.

14. There is open communication among team members.

15. Team members focus on understanding the perspectives of others rather than defending their own specific opinions.

16. The team supports each member in his or her work with youth.

17. There is freedom to be different and disagree within the team.

18. New practices related to working with youth occur as a result of the diversity of ideas among team members.

19. Working with team members who have multiple perspectives results in new programs available to help youth.

20. The roles and/or responsibilities of team members change as a result of teamwork.

21. As a result of working as a team, services/supports for youth are delivered in new ways.

22. Team members take on tasks outside their role when necessary.

23. The team depends on members with varying roles (e.g., teacher, mental health professional, paraprofessional, special educator, family member, etc) to implement specific activities.

24. The team relies on members with varying roles (e.g., teacher, mental health professional, paraprofessional, special educator, family member, etc) to accomplish its goals.

25. The team makes distinctions among the roles and responsibilities of each member.

26. The team consults with members who have a variety of perspectives about how to address the needs of youth.

* indicates reverse scoring due to negatively worded items

Appendix B: Survey

Section one: Demographics/caseload

1. What grades do you serve?

2. How many years have you been practicing as an SLP?

3. How many years have you practiced as an SLP in the school setting?

4. How many years have you been providing AAC services?

5. Select which best represents your current level of employment

    a. 30-40+ hours a week

    b. 20-29

    c. 10-19

    d. less than 10

6. How many students are on your caseload?

7. Approximately how many students on your caseload use AAC?

8. What type of training have you received in AAC? select all that apply

    a. University online course

    b. University in person course

    c. Individual contact with university/college staff (e.g., participating in a college professor's research lab)

    d. In service/workshops/seminars,

    e. Company representative

    f. School district staff

    g. Reading AAC literature

    h. Other (please list)

9. Based on the definitions below (Beukelman, Ball, & Fager, 2008), how would you

  rate yourself? (place an x on the continuum)

General Practice Clinician; AAC Intervention Specialist; AAC Facilitator

General Practice Clinicians provide a range of clinical services as part of their daily

practice. Although they do not specialize in AAC intervention services, the agencies

where they work serve children and adults who use AAC.

AAC Intervention Specialists spend at least 50% of their clinical workload providing

direct services (e.g., assessment, instruction, funding assistance, and follow-up) to

individuals who use AAC.

AAC Experts focus on developing and maintaining the knowledge, technical, policy,

and service bases of the AAC field. They include university faculty, consultants,

researchers, technology developers, policymakers, and administrators of specialized

service programs.

Section two: About AT team

  10. Does an AAC intervention specialist consult with your team?

       a. Yes

       b. No

       c. I am an AAC intervention specialist

       d. Other: _____ please explain

  11. Who is a part of your regular AAC/AT team? Select all that apply.

According to Beukelman et al. (2005), regular AAC team members serve regularly on

AAC intervention teams. These regular members include AAC specialist who lead

teams or consult closely with them on a regular basis, and those who intermittently

serve on AAC teams but do not consider themselves to be AAC specialists"

    a. AAC specialist

    b. General education teacher

    c. Special education teacher

    d. Paraprofessionals

    e. School psychologist

    f. Occupational therapist

    g. Physical therapist

    h. Nurse

    i. Other (please list) …

12. Who is a part of your Occasional AAC team? Select all that apply

According to Beukelman et al. (2005), Occasional AAC team members are individuals

who occasionally serve on AAC teams. For example, a regular education teacher would

be an Occasional AAC team member if they had a student who used AAC in their class.

Other examples of Occasional AAC team members are nurses and vocational

counselors.

    a. General education teacher

    b. Special education teacher

    c. Paraprofessionals

    d. School psychologist

    e. Occupational therapist

    f. PT

g. Nurse

h. other… please list

13. Who is a part of your Specific AAC team?

According to Beukelman et al. (2005) Specific AAC team members are persons who are members of teams that support specific individuals who use AAC systems, but probably do not serve on other AAC teams. Examples of Specific AAC Team members include the person who uses AAC, their family members, and caregivers.

a. General education teacher

b. Special education teacher

c. Paraprofessionals

d. School psychologist

e. Occupational therapist

f. Physical therapist

g. Nurse, other…

14. Do you consider yourself a regular, occasional, or specific AAC team member? Select all that apply.

a. Regular

b. Occasional

c. Specific

Section three: Team functioning

15. How often did you meet with related professionals (gen ed teachers, sped teachers, OT, psych) prior to the pandemic?

a. Daily

b. Weekly

c. Monthly

d. When requested

e. At IEP meetings

f. Other (please explain)

16. How often did you meet with related professionals during the pandemic?

a. Daily

b. Weekly

c. Monthly

d. When requested

e. At IEP meetings

f. Other (please explain)

17. How did you meet prior to the pandemic?

a. Video call

b. Scheduled meetings

c. Unscheduled meeting

d. E-mail

e. Phone call

f. Other (please explain)

18. How did you meet during the pandemic?

a. Video call

b. Scheduled meetings

c. Unscheduled meeting

    d. E-mail

    e. Phone call

    f. Other (please explain)

19. How often did meetings have an agenda prior to the pandemic?

    a. All the time

    b. Sometimes

    c. Most of the time

    d. Never

20. How often did meetings have an agenda during the pandemic?

    a. All the time

    b. Sometimes

    c. Most of the time

    d. Never

21. How often does did your team share student progress prior to the pandemic?

    a. Daily

    b. Weekly

    c. Monthly

    d. When requested

    e. At IEP meetings

    f. Other (please explain)

22. How often did your team share student progress during the pandemic?

    a. Daily

    b. Weekly

      c. Monthly

      d. When requested

      e. At IEP meetings

      f. Other (please explain)

23. How does your team address conflict?

24. How often did you adjust your treatment based on other team members ideas/goals prior to the pandemic?

      a. Daily

      b. Weekly

      c. Monthly

      d. When requested

      e. At IEP meetings

      f. Other (please explain)

25. How often did you adjust your treatment based on other team members ideas/goals during the pandemic?

      a. Daily

      b. Weekly

      c. Monthly

      d. When requested

      e. At IEP meetings

      f. Other (please explain)

26. How has the pandemic affected your ability to collaborate with school-based professionals?

27. What lessons have you learned about your team/your teams functioning that will affect the future?

28. How has your practice changed to include direct family participation during COVID-19 when addressing AAC goals/tools/strategies?

29. What are the greatest strengths of your team?

30. What are the biggest challenges that you and your team face?

31. If you could change something about the way your team collaborates in the future, what would it be?

32. Please enter your email below so you can receive your $10 amazon gift-card.