INITIAL SELECTION OF TACTILE AUGMENTATIVE AND ALTERNATIVE COMMUNICATION SYMBOLS FOR STUDENTS WITH COMPLEX SUPPORT NEEDS

by

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Abstract

Tactile symbols are often used as a form of communication for students with complex support needs, specifically those that have comorbidity of blindness or visual impairment. Tactile symbols allow students to interact, communicate, and participate with their family, peers, and community. Tactile symbols are either individualized to a student or standardized within a classroom or school setting. There is no universal process around the selection process, purpose, and implementation of tactile symbols. Although this type of symbol is often used with students with such needs, the literature is limited. Therefore, the purpose of this study was a survey key school professionals' and their experiences around the selection process of an individualized or standardized tactile symbol set for student's complex support needs and comorbidity of blindness or visual impairment. Descriptive statistics portrayed that the initial selection of tactile symbols for students with complex support needs were selected based on the student's demographic and not the teacher's demographic, pre-service training, and background. A trend in the selection of an individualized tactile symbol over standardized symbols was also observed.

INTRODUCTION

Factors Contributing to the Selection of Tactile AAC

Communication is defined as the exchange of information from one person to another about their needs, wants, and emotions (Trief, 2007). Individuals can express their communication in a variety of ways, including verbally, written, or nonverbally with symbols or gestures, these will depend on their ability to communicate. Students with complex support needs who also have a visual impairment, access their communication needs in separate ways compared to typically developing students who usually access communication verbally. Students with complex support needs who are nonverbal communicators can receive help from the use of augmentative and alternative communication (AAC) practices to learn and use as their primary mode of communication. AAC allows students to use unique techniques and tools to communicate with familiar and unfamiliar communication partners. Specifically, for this study, the type of AAC selected to analyze was tactile AAC symbols.

There is limited literature on tactile symbols and their iconicity specifically for students with complex support needs defined for this study. Research by Fuller and Lloyd (1991), refers to the iconicity of a tactile symbol as the visual relationship a symbol may have to its significance. The visual similarities between the symbol itself and the purpose of using the symbol were only one of many factors considered when deciding the selection process. Research by Schlosser and Sigafoos (2002), further defined iconicity as any type of association that the individual forms with the symbol, not only including the visual relationship. The iconicity of a symbol may be related to the outlining symbol's shape, color of symbol, action and animation of symbol, symbol's purpose and value, transparency, complexity, and graphic symbol structure (Dada et al., 2013). Research by Dada et al. (2013), examined symbol effects on students who

had a mild intellectual disability and were English Language Learners that displayed iconic relationships between needing the visual representation of the symbol versus graphic representation of the symbol to select it. Although the students in the research conducted were not students with complex support needs, they could access the symbols through the sense of touch rather than sight. Finding that the symbol itself can provide purpose and value for the student due to multiple factors other than visual representation is something that should be recognized when the initial selection of symbols for students with complex support needs are being considered.

When selecting tactile AAC for a student with complex support needs, there may be several factors to consider and contribute to the selection of AAC. These factors can include but are not limited to its functionality, picture versus text-based communication, customizable devices for specific needs, ongoing user support, variety of access methods, expense, and portability and durability of the device (Sreekumar et al., 2018). The implementation of tactile AAC symbols can be taught in different contexts and purposes based on the objectives of the students' needs (Aasen & Naerland, 2014). Tactile AAC has been implemented in a variety of settings, including the school setting, for initiation cues for communication, step-by-step directions, transitioning, information and clarification of scheduling, etc. (Aasen & Naerland, 2014).

Because the fit between the needs and skills of the students with complex support needs is a key contributor to the outcome of AAC intervention (Prichett et al., 2011), the identification of the most effective type of symbol, is essential (Da Fonte et al., 2019a; Da Fonte et al., 2019b). *Abstract symbols* include speech, sign, printed words to represent consistent and effective communication (Russell & Willis, 2020). These symbols are difficult for students with complex

support needs to use because they are solely visual. On the other hand, *concrete symbols* are items that are both physically and conceptually tangible to their user (Russell & Willis, 2020). Students with complex support needs can benefit from concrete symbols by gaining information from the physical features of the symbols through touch rather than sight.

Students with complex support needs who have visual impairments experience barriers when challenged with attempting to visually access picture symbols, signs, gestures, and line drawings for communication (Aasen & Naerland, 2014). In these instances, providing students with complex support needs with opportunities to use tactile AAC is known to enhance students' ability to learn how to discriminate between shapes, textures, and communicative purposes (Roche et al., 2014). Tactile AAC gives the students complex support needs, a form of communication and a way of accessing their educational environment and content. When students with complex support needs are given opportunities to explore with their hands and manipulate tactile symbols that are representing situations, activities, and concepts in relation to actual taking part in the activity, the event may become more comprehensible for the student (Aasen & Naerland, 2014).

Another factor that serves as a key part of the initial selection process of tactile AAC for students with complex support needs is collaboration. The coordination of implementing tactile AAC primarily comes from the speech and language pathologist (SLP) who conducts specific assessments on the student collecting data on their abilities and needs to communicate. When deciding which type of symbols best fits the specific student, the student’s skills, abilities, and needs should be considered in the process (Calculator, 2009). The SLP will begin to model evidence-based practices designed to improve the level of active participation and quality of life for the students to train other professionals such as teachers, related service providers, etc., on

how to navigate the tactile AAC when working with the student (Calculator, 2009). The selection of AAC for students can be a long-term process because the student should have the opportunity to explore and use multiple types of AAC before the final decision is made. As well as having all professionals involved in the decision-making process agreeing upon the tactile AAC symbol system that best fits the students' needs. Professionals are encouraged to provide the student with the opportunity to explore multiple methods of AAC when conducting assessments on students to find which system is most right for them (Calculator, 2009).

Professionals Involved in Selecting Tactile AAC

Multiple members should be involved in the initial selection process of a student's tactile AAC system. The students Individualized Education Program (IEP) team members (i.e., student, parents/guardian, special education teacher, general education teacher, a school representative, related service providers) should be involved and come to an agreement upon decision-making in all domain areas for each student. When considering tactile AAC for students with complex support needs, three school professionals hold expertise of important consideration and are the Teacher of Students with Visual Impairments (TVI), Severe Disabilities Teacher (SD Teacher), and Speech-Language Pathologist (SLP). The roles of each of the three professionals differ based on their specific expertise.

A TVI's role is to provide direct and consultation services to aid students with visual impairments access their educational resources by adapting materials, conducting Essential Assessments (i.e., functional vision assessment, learning media assessment, expanded core curriculum, assistive technology assessment), and teaching their students the areas of the expanded core curriculum. A SD teacher's role is to adapt general education lessons and curriculums to educate their students with severe and multiple disabilities. An SLP works closely

with students with complex support needs implementing different AAC devices and symbols including tactile AAC. SLP's integrate tactile AAC interventions with the student during their service time to help the student learn and understand this form of communication to reach their full potential (Johnson & Prebor, 2018). Although there are other professionals apart of the students IEP team, these three professionals specifically work closely with students with complex support needs to access their communication or academic material through the AAC symbols.

Previous studies on the use of tactile AAC have portrayed significant positive impacts for individuals with severe and multiple disabilities (Trief, 2007; Roche et al., 2014). It is worth noting that some of the previous studies being discussed did not have any participants with visual impairments as their subjects (Trief, 2007). Although tactile AAC is to provide a student access to a form of communication, it has also affected other factors for students' functional and educational access. The use of AAC for students with severe and multiple disabilities has increased functional communication and decreased the occurrences of problem behaviors such as hitting, biting, or throwing items (Trief, 2007). Research by Aasen & Naerland (2014), has reported that on-task behavior has increased due to the implementation of visual and concrete symbols for students with complex support needs. The use of the tactile AAC symbols for students with complex support needs has helped with establishing routine-based instruction and daily scheduling. However, evidence-based practices and effective practices have not been found within this selection and determination process by these professionals to best suit the needs of their students. There is a lack of universal agreement between when and how selection of an individualized versus a standardized tactile AAC system should be approached. Although each student's case can be different based on their IEP and IEP team members' decisions, there should

be guidelines for the professionals within this field to follow. There are several factors contributing to the selection of tactile AAC, but for professionals to complete the select process of tactile AAC symbols for students with complex support needs conduction of multiple informal (e.g., observations) and formal (e.g., surveys, checklists, questionnaires) assessments must happen.

Assessments Used for Determining Tactile AAC Format

The initial selection of AAC for a student with complex support needs should be decided based on assessments conducted on the student by a professional in the field. Data driven decision making should be the only way to decide a form of communication for the student in mind. Assessments vary depending on professional roles and expertise in their role discussed in the earlier section. TVIs, SD Teachers, and SLPs should be trained in their area of expertise and how to conduct these specialized assessments on students. Both informal and formal assessments are used during the conduction process in highlighting the student's abilities and needs for communicating. A TVI conducts a learning media assessment to systematically collect data on how effective print, braille, and auditory information is accessed by the student (Trief, 2013). This assessment also collects data to document reading rates, accuracy, comprehension, fluency, and efficiency (Trief, 2013). The learning media assessment considers all literacy options for the student including tactile AAC.

Some assessment tools that SLPs use to assess a student's communication skills include the Communication Matrix (Brady et al., 2016), Dynamic AAC Goals Grid (DAAG-2; Brady et al., 2016), and Functional Communication Profile (Brady et al., 2016). The most common assessment tool is the Communication Matrix. This assessment is a suitable assessment tool for students with complex support needs and is organized based on seven levels of communication

(i.e., pre-intentional behavior, intentional behavior, unconventional communication, conventional communication, concrete symbols, abstract symbols, and language; Rowland, 2004). The one-page profile matrix aids in deciding what type of symbol and level of communication the student is currently performing at (Rowland, 2004).

Assessments provide professionals with data on student's strengths and areas of needs for communication and more. When assessing communication skills, finding both the students' receptive and expressive communication skills is important. For students with complex support needs, the communication assessments depend on the comprehensive approach of a student (Brady et al., 2016). The information assessed needs to show the student's sensory needs and abilities with vision and motor movement abilities and limitations (Brady et al., 2016). The student's sensory efficiency considers their acuity, perception, and integration of primary sensory channels (i.e., visually, auditory, and tactual). The students' needs and abilities additionally with motor movement could also be affecting the selection of a communications system based on the students' range of motion, strength, tone, and positioning implications (Brady et al., 2016). The purpose of this study was to conduct a survey to collect data on how TVIs, SLPs, and SD Teachers decide between the two tactile AAC symbol symbols for students with complex support needs given the gap in making informed decisions prior.

Individualized and Standardized Tactile AAC Symbols

For students with complex support needs, tactile AAC provides students with the ability to communicate what they are requesting, rejecting, and how to socially interact with others (Snell, 2006). Tactile AAC symbols are valuable for students with complex support needs as they place less demand on memory and representational ability, making it more appropriate for expressive communication (Trief et al., 2010). The selection and presentation of tactile AAC

symbols can be for the specific needs of an individualized student or standardized for a group of students with complex support needs. There are two primary formats of the tactile AAC symbols for students with complex support needs. *Individualized tactile AAC symbols* are tactile objects or symbols where all or most of the symbols are unique to the student. *Standardized tactile AAC symbols* are tactile objects or symbols, where all or most of the symbols are selected from a pre-existing symbol dictionary (e.g., Standardized Tactile Augmentative Communication Symbols [STACS (Standardized Tactile Augmentative Communication Symbols)], or a classroom, school, or district wide tactile AAC dictionary).

Individualized Tactile AAC Symbols

For individualized tactile AAC symbols, the IEP team members will need to collaborate, involving the TVI, SLP, and SD Teacher to design each symbol based on the experience of the student using the symbols. When creating an individualized tactile AAC symbol set, the students' sensory efficiency (i.e., the use of a student's ability to use their senses to access their environment) should be considered. Personalizing the tactile AAC with the student's preferences in mind is important so that the tactile AAC does not become an aversive based on the tactile features (Prichett et al., 2011). Based on the assessments conducted, the professionals involved in the decision-making process in selecting the tactile AAC symbols can gain knowledge about the students' willingness to explore added items, textures, etc. Tactile information processing is the ability to differentiate between the sense touch, texture, pressure, temperature, and movement detected typically by the student's hand (Prichett et al., 2011). Choosing what will be the most appropriate based on the individual students' sensory needs will not affect their ability to use the tactile AAC symbols solely because of sensitivity to certain textures.

Creating individualized AAC symbols for a particular student can hold several benefits. The system can be tailored to that student based on their preferences, interests, needs, and strengths (Schlosser & Sigafoos, 2002). Some studies addressed the selection and implementation of AAC based on questionnaires completed by various stakeholders, such as parents, special education teachers, and SLP (Trief, 2007; Roche et al., 2014). However, none of the studies have measured or assessed the impact of iconicity, concreteness, and realism of the symbols (Roche et al., 2014). Designing an individualized symbol set around the student can make the learning process more meaningful and valuable for the student themselves (Roche et al., 2014).

Standardized Tactile AAC Symbols

For a standardized symbol set, all or most of the symbols used by the student are not unique to the individual student. Rather, the standardized tactile AAC symbols include symbols that are used across multiple students and do not tailor to an individualize students' needs. The tactile AAC can be implemented within the classroom setting for all students to use as a universal communication method between students and professionals. For example, in a kindergarten classroom the entire class might use a standardized set of tactile AAC symbols for morning meeting where they discuss the calendar, weather, and classroom rules (Trief et al., 2013). The standardized tactile AAC symbols are beneficial for students that attend residential or specialized schools for students with complex support needs (Trief, 2010; Downing, 2005). Implementing standardized tactile AAC symbols for a residential school, such as a school for the blind, can aid students with complex support needs with communicating, actively participating, navigation, etc., when landmarks are labeled and familiar for all students within the school. When students with complex support needs are outside of the familiar setting with the

implementation of the standardized tactile AAC symbols in place, it can create barriers of communication for the student.

Research by Trief et al (2013), conducted a study based on tracking a standardized set of tactile AAC and the learning rate of 43 children with complex support needs who had limited to no verbal language across seven months of classroom-based intervention. Over a four-month period, the results from the study showed that even students with complex support needs were able to identify the use of several tangible symbols in about 46% with different communication partners involved (Trief et al., 2013). The participants interacted with familiar communication partners, the TVI, SD teacher, and SLP were conducted during three distinct phases. The participants in Trief et al (2013), were being gradually taught the specific set of standardized symbols over a month span or until ability in each student with about 5 symbols at a time. In this study, the symbols were implemented within a specific curriculum created during daily instructional classroom routines. The curriculum was based on providing access to this form of communication for the students in a variety of ways including requesting, labeling an activity, person, or object, decision making skills, and describing the behaviors of others. When the participants were grouped together in small groups for intervention, a significant difference was clear between students who had motor impairments versus those who did not (Trief et al., 2013). The students who did not have limited motor movement could acquire more knowledge and use of the symbols than those with limited motor movement. The research question includes: what factors correlate with key school professionals' selection of an individualized or standardized tactile AAC symbol system for students with complex support needs?

METHODS

Survey Study Method

Survey Sample and Data Collection Procedures. Eligible survey participants included teachers of students with visual impairments (TVIs), speech language pathologists (SLPs), and severe disabilities teachers (SD teachers) in the United States**.** The TVI, SLP, and/or SD teacher must have worked with one or more students with complex support needs (including suspected visual impairments) who used tactile AAC symbols. They needed to be a participant in the initial selection of tactile AAC symbols for a student during the 2020-21, 2021-22, or 2022-23 school years. Data collection ran from August 22 through October 17, 2022. Survey recruitment emails were distributed to professional contacts by the research team. The email invitation included a description of the purpose of the survey as well as a bulleted list of what participants would be eligible to complete the survey. Emails were sent to American Printing House for the Blind Ex Officio Trustees, state AER Chapters, American Printing House for the Blind Trustees, Special Education Administrators across the United States, Speech-Language-Hearing Associations, Council for Exceptional Children across the United States, Schools for the Blind across the United States (e.g., Perkins School for the Blind, Oklahoma School for the Blind), etc. Email recipients were encouraged to share the survey announcement with colleagues who may be eligible.

Survey Instrument. Prior to its release, the survey was reviewed by experts in the field. Dr. Sarah Ivy, Dr. Carlie Rhoads, and Dr. Hilary Travers supplied feedback on the survey. Dr. Ivy is an assistant professor at the University of Utah and used to be an SD teacher. Dr. Ivy specifically works with the systematic approach of tactile AAC symbols for students with complex support needs and how to adapt symbols for this population. She has multiple years of experience with comprehensive training and working with students with complex support needs. Dr. Rhoads serves as American Federation of the Blind's (AFB) Program Metrics and Evaluation

Specialist, after initially joining the organization as a research specialist. Before AFB, Dr. Rhoads was an SD teacher emphasizing on students with sensory disabilities, later becoming the Director of the Oregon Deafblind Project. Dr. Travers is a senior research associate at Vanderbilt University. Dr. Travers was an SD classroom teacher for high school students with deafblindness.

Survey Revisions of Structural and Conceptual Edits. Based on their feedback, several changes were made to the survey draft. For the survey question, "Which of the following best describes the student's functional vision at the time the AAC system was being discussed," cortical/brain-based visual impairment (acuity unknown or may fluctuate) was added as a multiple-choice option. In the professional experience section, "comprehensive" from "did data from a comprehensive communication assessment inform the IEP's decision on the initial selection of tactile AAC for the student?" was removed. Lastly, the list of the type of AAC selected for the student was expanded. The options for this question are now separated by whole objects or part of an object either mounted on a card or board or not mounted on a card or board. The student's prior communication abilities for both receptive and expressive communication was combined as one question. However, based on feedback from the reviewers, the questions were separated for receptive and expressive communication. Examples for receptive and expressive communication were provided in the question as well. Operational definitions were provided for variables of interest throughout the survey sections to indicate what is meant by the specific variables and indicators being asked (see Appendix A).

Survey Revisions of Language Clarification Edits. In addition to larger structural edits, several smaller language clarification revisions were made based on the reviewers' feedback. In the introduction text of the survey, "blind or visually impaired" was changed to "visual

impairment." Since the study revolves around AAC symbols, the definition of AAC was added to the introduction matter of the survey. The explanation of what an SD Teacher is was added to the consent and introduction materials. The meaning of the terms tactile AAC, individualized tactile AAC, and standardized tactile AAC were included in the first full page of the survey and in the professional experience section. For the survey question, "What was the student's primary education placement?" early intervention and home-bound or hospital setting was added as a multiple-choice option.

Statistical Analysis Method

Outcome Variable. The outcome variable that is the focus for this analysis is the type of symbols being used for students with complex support needs. The types of symbols include individualized or standardized. The variable was coded as a binary variable in the descriptive statistics, correlations, and chi-square models. The outcome measure of the frequencies with the percentages of the selection of individualized or standardized tactile AAC symbols was calculated.

Variables of Interest

Role of Professional. The professional role documents the participant's profession (e.g., TVI, SLP, or SD teacher). The professional may be currently employed in this position, or no longer employed in this position but they were at the time they participated in an IEP team making decisions about the initial selection of tactile AAC for students with complex support needs.

Years in Role. The years in the role the participant was employed. In the survey a continuous table was created for the participants to report how many years they have been in this

current role. The survey provided the participants with a scale of 1 – 35 years for them to report their years in the role.

Pre-Service Training. The purpose of these variables was to show if pre-service training or any training at all was provided to the participant at any time prior to their role or while in their role (see Appendix A). There could be potential correlations with participants having pre-service training or not with the types of symbols they select for their student. The following options within the matrix for all three variables were (1) not prepared, (2) minimally prepared, (3) moderately prepared, and. (4) well prepared. The questions asked if the participants received training around the following considerations: if students with complex support needs should have a primarily tactile or visual AAC symbols; deciding if students with complex support needs should have individualized AAC symbols; and figuring out if students with complex support needs should have standardized AAC symbols (see Appendix B for an excerpt of survey questions).

Functional Vision. Participants were asked to report the level of functional vision or visual acuity for the student they were answering the survey about. Because many students with complex support needs do not have quality eye reports/assessments, the following options were used. (1) Low vision (e.g., approximately 20/70-20/180 acuity or slightly reduced visual fields), (2) legally blind (20/200) with functional vision or visual fields of 20 degrees or less, (3) light perception only, (4) no light perception, (5) Cortical/Brain-based visual impairment (acuity unknown or may fluctuate), and (6) no diagnosed visual impairment; educational team suspected visual impairment (see Appendix A). This variable was measured categorically as a frequency to figure out if vision is a factor relative to the selection of individualized or standardized symbols.

Additional Disabilities. Participants were asked to fill out a section of the survey questions with a specific student in mind. The participants for this variable were to report if the student had any additional disabilities and if yes, name which one or ones. Because the respondents' students could have additional disabilities, the following disabilities were included in the survey. The disabilities were: (1) autism spectrum disorder, (2) Intellectual Disability, (3) Hearing Impairment, (4) Physical / Motor Impairment, (5) Speech / Language Impairment, (6) Deafblindness, (7) Other which had a write-in section, and (8) no other disabilities.

Grade Level. Participants were asked to report what grade level the specific student in mind was in when they themselves or a collective group of professionals were selecting the students' tactile AAC symbols. In the survey, a list was created for participants to report which grade level specifically. The following options were: (1) Early Intervention, (2) Pre-K3, (3) Pre-k4, (4) Kindergarten, (5), 1st grade, (6) 2nd grade, (7) 3rd grade, (8) 4th grade, (9) 5th grade, (10) 6th grade, (11) 7th grade, (12) 8th grade, (13) 9th grade, (14) 10th grade, (15) 11th grade, and (16) 12th grade.

Professional Experience with AAC. Participants were asked to answer survey questions # 23-32 (see Appendix B) on a Likert rating scale to what extent they agree or disagree with each statement about the selection of tactile AAC with a specific student in mind. The following options within the scale for all variables in this section were (1) strongly disagree, (2) moderately disagree, (3) disagree slightly, (4) agree slightly, (5) moderately agree, and (6) strongly agree. The questions specifically were asking if all IEP team members were included and contributed to the decision-making process of AAC selection, if the participant themselves were the primary IEP member who were conducting assessments, if the SLP should have collaborated when finding the tactile AAC for their student, and as the professional themselves.

FVLMA Data. The Functional Vision Learning Media Assessment (FVLMA) are two of the essential assessments conducted with students with visual impairments. The FVA is a comprehensive evaluation of a student's use of vision and other sensory input to complete daily activities. Functional vision must be assessed to find the educational impact of the student's visual impairment and to decide what accommodations and adaptations should be implemented. The LMA is completed with the FVA to collect current data and consider future student needs so that the IEP team can make informed, data-driven decisions on proper learning medium for each student. For this study, it is important to look at the statistics of this variable to see if the initial selection is data driven. Participants asked to answer three yes or no questions # 33-35 for this section. The three questions were asking the participant whether data from the assessments conducted (e.g., functional vision learning media assessment, comprehensive communication assessment, and other additional assessments written in by participant).

Communication Data. It is important to determine if data from a communication assessment has a critical role in the decision on the initial selection of tactile AAC for the student in mind. This section of questions in the survey asked participants about students receptive and expressive communication abilities and needs based on assessment results of the students' when having an individual student in mind.

Students' Receptive Communication Level. Receptive communication occurs when a person understands the information being communicated to them through verbal and nonverbal modes. Participants were asked to indicate which of the following options best described the student when tactile AAC symbol selection was being made: (1) pre-symbolic (e.g., communication with facial expressions and/or gestures), (2) symbolic (e.g., sign language, AAC symbols, eye gaze, and/or written language), and (3) verbal communicator (e.g., functional

speech and/or spoken language). The options for this question were developed based on the Communication Matrix.

Students' Expressive Communication Level. Expressive communication occurs when a person shares their thoughts, wants, and needs with others through verbal and nonverbal communication. Participants were asked to indicate which of the following options best described the student when tactile AAC symbol selection was being made: (1) pre-symbolic (e.g., communication with facial expressions and/or gestures), (2) symbolic (e.g., sign language, AAC symbols, eye gaze, and/or written language), and (3) verbal communicator (e.g., functional speech and/or spoken language). The options for this question were developed based on the Communication Matrix.

Statistical Study Data Analysis

Descriptive statistics (mean, median, standard deviation, minimum and maximum) for all variables were analyzed and reported. To analyze potential relationships between the outcome variable, role of professional, years in role, pretraining, functional vision, additional disabilities, grade level, product type, FVLMA data, communication data, receptive communication, and expressive communication were addressed using correlation and chi-square matrices.

RESULTS

Survey Response & Participant Response

There were 148 participants who took part in the survey. After removing bot responses and partially completed responses, a total of 77 responses were included in the current analysis because they at least answered the primary question of interest (whether the student had individualized or standardized tactile AAC symbols). The participants' roles were measured

within the frequency table and outcomes were reported as follows: TVI *n* = 58 (74.4 %), SD Teacher *n*= 8 (10.3%), and SLP *n*= 11 (14.1%).

Descriptive Statistics Results

Outcome Variable. The outcome measure of the frequencies with the percentages of the selection of an individualized or standardized tactile AAC system was calculated with the following outcomes: individualized symbols *n* = 44 (56.4 %) and standardized symbols *n*= 33 (42.3%).

Variables of Interest

Years in Role. Participants reported the number of years in their role which ranged from 1-35 years, with an average of about 12 years (standard deviation = 9.12). Most of the participants had 3 - 17 years of experience. The descriptive statistics were as follows: mean = 12.26 years; median = 10 years; mode = 1 year; standard deviation = 9.12 years.

Pre-Service Training. Questions # 7 – 12 (see Appendix B) in the survey were to ask the participants about their training and experiences around AAC for students with complex support needs. Overall, across the three preparedness questions, respondents felt moderately prepared in the selection process of deciding if students with complex support needs should have a primarily tactile or visual AAC system, an individualized AAC system, and/or a standardized AAC system. The most selected preparedness level for determining primarily tactile or visual AAC symbols was feeling moderately prepared. Compared to the most selected preparedness level of determining an individualized system and deciding a standardized system with determining an individualized or standardized AAC system which was feeling minimally prepared. Table 1 provides a full summary of responses.

Table 1. Participants' Self-Reported Level of Preparedness from Pre-Service Training

Matrix				
Pre-Service Training	**Not Prepared**	**Minimally Prepared**	**Moderately Prepared**	**Well prepared**
Determining primarily tactile or visual AAC system	18 (23.4%)	21 (27.3%)	29 (37.7%)	9 (11.7%)
Determining an Individualized System	17 (22.1%)	27 (35.1%)	26 (33.8%)	7 (9.1%)
Determining a Standardized system	18 (23.4%)	29 (37.7%)	25 (32.5%)	5 (6.5%)

Note: reported is the *n* value and (percentage) of each of the respondents per matrix

Functional Vision. The students' reported functional vision ranged across participants. Low vision *n* = 3 (3.9 %), legally blind *n* = 13 (16.9%), light perception only *n* = 7 (9.1%), no light perception *n* = 16 (20.8%), Cortical/Brain-based visual impairment *n* = 34 (44.2%), and no diagnosed visual impairment *n* = 4 (5.2%). The most frequent functional vision option selected by respondents was Cortical/Brain-based visual impairment with 34 (44.2 %) respondents.

Additional Disabilities. The following percentages were measured for each of the additional disabilities as a yes or no choice for the respondents. The respondents had the opportunity to check all that applied to this survey question, so the total percentage is above 100. Only the yes percentages will be listed as follows: Autism Spectrum Disorder *n* = 27 (35.1%), Intellectual Disability *n* = 52 (67.5 %), Hearing Impairment *n* = 2 (2.6 %), Physical/ Motor Impairment *n* = 42 (54.5 %), Speech / Language Impairment *n* = 51 (66.2%), Deafblindness *n* = 7 (9.1%), Other which had a write-in section *n* = 8 (10.4 %), and No other disabilities *n* =4 (5.2%).

Grade level. The grade level variable measured as frequencies were as follows: mean = 7.9 grade, standard deviation 4.67 grade, and the mode was 7th grade.

FVLMA Data. The data reported from the FVLMA was reported with only 70 respondents answering this question and depicted that *n = 50 (*64.9 %) of respondents used FVLMA's data to inform the IEP team's decision on the initial selection of tactile AAC symbols for the student. There was *n* = 20 (26 %) of respondents that selected no for this survey question.

Communication Data. The communication assessment data was measured and reported. These results showed that *n* = 59 (76.6 %) of the respondents rely on data from a communication assessment that informs the IEP's decision on the initial selection of the tactile AAC symbols for the student. There was *n* = 11 (14.3 %) of respondents that selected no for this survey question and 7 participants did not answer this question.

Students' Receptive Communication Level. The student's receptive level of communication abilities at the time tactile AAC symbols selection was made was reported by participants. The following was reported by the respondents: pre-symbolic *n* = 34 (44.2 %), symbolic *n* = 18 (23.4%), verbal communicator *n* = 25 (32.5 %).

Students' Expressive Communication Level. The student's expressive level of communication abilities at the time tactile AAC was reported. The following was reported by the respondents: pre-symbolic *n* = 51 (66.2%), symbolic *n* = 17 (22.1%), and verbal communicator *n* = 9 (11.7%).

Correlation Statistical Analysis

Outcome Variable. The correlations were measured by correlating the type of symbol with each variable of interest to answer the research question displayed in Table 2 below. The

outcome variable and years in role r (75) -. 355, p = < 0.05; Intellectual disability r (75) - .464, p = < .001; No additional disability r (75) .270, p = < 0.05.

Role of Professional. Between role and pre-service training 2 in determining primarily tactile or visual AAC system r (75) -.339, p = < 0.01; Pre-service training 3 in selecting an individualized tactile AAC system r (75) -. 235, p = < 0.05.

Pretraining. Between deciding if students with complex support needs should have a primarily tactile or visual AAC symbols and role r (75) -.339 , p = < 0.01; deciding if students with complex support needs should have individualized AAC symbols r (75) .873, p = < 0.001; Deciding if students with complex support needs should have standardized AAC symbols r (75) .835, p = < 0.001; Speech and language impairment r (75) -.233, p = < 0.05.

Between deciding if students with complex support needs should have individualized AAC symbols and role r (75) -.339, p = < 0.01; deciding if students with complex support needs should have standardized AAC symbols r (75) .907, p = < 0.001; Speech / language impairment r (75) -. 278, p = < 0.05; Communication data r (75) .330, p = < 0.05.

Between deciding if students with complex support needs should have standardized AAC symbols and if students with complex support needs should have a primarily tactile or visual AAC symbols r (75) .835 p = < 0.001; deciding if students with complex support needs should have individualized AAC symbols r (75) .907, p = < 0.001; Speech / language impairment r (75) -. 277, p = < 0.05; FVLMA r (75) .254, p = < 0.05; Communication data r (75) .353, p = < 0.01.

Functional Vision. There were no significant correlations between vision and any other variables of interest displayed in table 2 below.

Additional Disabilities. There were significantly significant correlations between the following variables: autism spectrum disorder and physical/motor impairment r (75) -.368, p = <

0.001, intellectual disability and physical/ motor impairment r (75) .370, p = < 0.001, intellectual disability and type of symbol r (75) - .464, p = < 0.001, and physical/motor impairment and speech/language impairment r (75) .617, p = < 0.001.

Grade Level. Between grade level and student's expressive communication level r (75) .338, p = < 0.01.

FVLMA Data. Between FVLMA and selection of a standardized tactile AAC system (see Appendix B) r (75) .254, p = < 0.05.

Communication Data. Between communication data and deciding if students with complex support needs should have individualized tactile AAC symbols r (75) .330, p = < 0.005; deciding if students with complex support needs should have standardized AAC symbols r (75) .353, p = < 0.01.

Students' Receptive Communication Level. Between student's receptive and expressive communication level there was significant correlation r (75) .498, p = < 0.001.

Students' Expressive Communication Level. Between student's expressive and receptive communication level there was significant correlation r (75) .498, p = < 0.001; Grade level r (75) .338, p = < 0.01; No other disabilities r (75) .353, p = < 0.05.

Table 2. Correlation Matrix of the Variables of Interest

Variables	1	2	4	5	6	7	8	9	10	11	12	13	14
1: type of symbol													
2: role	-0.10												
3: preservice2	-0.12	-0.34**											
4: preservice3	-0.11	-0.24*	0.87***										
5: preservice4	-0.16	-0.22	0.84***	0.91***									
6: autism	0.13	-0.02	0.02	-0.00	0.00								
7: intellectual disability	-0.46***	-0.01	0.04	0.05	0.08	-0.06							
8: physical / motor impairment	-0.26*	0.13	-0.18	-0.19	-0.13	-0.37***	0.37***						
9: speech / language impairment	-0.21	0.12	-0.23*	-0.28*	-0.23*	0.08	0.39***	0.62***					
10: other disability (ies)	0.22*	0.17	-0.99	-0.07	-0.09	-0.25*	-0.22	-0.11	-0.20				
11: no other disability	0.27*	-0.13	0.03	0.05	0.01	-0.17	-0.34**	-0.26**	-0.33**	-0.09			
12: receptive communication level	-0.01	-0.01	0.13	0.06	0.14	0.07	-0.06	-0.09	0.03	0.05	0.17		
13: expressive communication level	0.08	-0.02	-0.00	0.05	0.03	-0.09	-0.15	0.03	-0.17	0.08	0.35**	0.5***	
14: communication assessment	0.03	0.22	0.22	0.33**	0.35**	-0.25*	0.03	-0.00	-0.23	-0.09	0.09	-0.03	-0.04

Note:***. Correlation is significant at the 0.001 level (2-tailed) **. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed). Pre-service2 = primarily tactile or visual AAC system, pre-service3 = individualized AAC system, and pre-service4 = standardized AAC system.

Chi-Square Test Results

Outcome Variable. A Chi-Square test of independence was performed to assess the relationship between the outcome variables and the variables of interest.

Role of Professionals. Since the p-value is not less than 0.05, there was no significant relationship between the outcome variable and role of professionals, χ^2 (2, N=77) = 1.35, p = .509.

Years in Role. Since the p-value is not less than 0.05, there was no significant relationship between the outcome variable and years in role, χ^2 (26, N=77) = 24.39, p = .554.

Pretraining. Since the p-value is not less than 0.05, there was no significant relationship between the outcome variable and finding a primarily tactile or visual AAC system (see Appendix B) χ^2 (3, N=77) = 5.61, p = .132. There was no significant relationship between the outcome variable and finding an individualized tactile AAC system (see Appendix B) χ^2 (3, N=77) = 2.59, p = .458. There was no significant relationship between the outcome variable and finding a standardized tactile AAC system (see Appendix B) χ^2 (3, N=77) = 3.48, p = .216.

Grade Level. Since the p-value is not less than 0.05, there was no significant relationship between the outcome variable and grad level, χ^2 (14, N=77) = 14.79, p = .392.

Functional Vision. Since the p-value is not less than 0.05, there was no significant relationship between the outcome variable and functional vision, χ^2 (5, N=77) = 2.04, p = .709.

Additional Disabilities. There was a significant relationship between the outcome variables and intellectual disability χ^2 (1, N=77) = 16.60, p = < 001; physical/motor impairment χ^2 (1, N=77) = 5.35, p = .021; Other additional disabilities χ^2 (1, N=77) = 3.76; p = .05; No other additional disabilities χ^2 (1, N=77) = 5.626, p = .018.

Since the p-value is not less than 0.05, there was no significant relationship between the outcome variable and Autism Spectrum Disorder χ^2 (1, N=77) = 1.374, p = .241; Hearing impairment χ^2 (1, N=77) = .043, p = .836; Speech / Language Impairment χ^2 (1, N=77) = 3.528, p = .06; Deafblindness χ^2 (1, N= 77) = .000, p = .659.

FVLMA Data. Since the p-value is not less than 0.05, there was no significant relationship between the outcome variable and FVLMA data, χ^2 (1, N= 70) = .292, p = .589.

Communication Data. Since the p-value is not less than 0.05, there was no significant relationship between the outcome variable and communication data, χ^2 (1, N=70) = .072, p = .789.

Student's Receptive Communication Level. Since the p-value is not less than 0.05, there was no significant relationship between the outcome variable and student's receptive communication level, χ^2 (2, N=77) = 1.458, p = .492.

Student's Expressive Communication Level. Since the p-value is not less than 0.05, there was no significant relationship between the outcome variable and student's expressive communication level, χ^2 (2, N=77) = .671, p = .715.

DISCUSSION

This study's purpose was to find what factors correlate with the initial selection and decision-making process of tactile AAC symbols for students with complex support needs. Based on the results of the study, a few variables correlate with the initial selection process for the type of tactile AAC symbols. Results showed that there were statistically significant correlations between student's disability(ies) and not the professionals' demographics when finding tactile AAC symbol type. Students with complex support needs, particularly intellectual disability, were more likely to be given individualized symbols compared to students without an

intellectual disability. Other disabilities are correlated with individualized symbols as well, but it is common to assume that some of those students have an intellectual disability.

This was a small study with only 77 respondents, and 80% of the respondents were TVIs. This is important to highlight as SLPs, not TVIs, are supposed to be the experts in communication assessment, implementation, and intervention. It is also important to address this due to the decision-making process for any student with an IEP being an IEP team agreed upon decision and not solely in the hands of one professional to make the executive final decision. A handful of survey questions asked participants about the collaboration process of selecting the tactile AAC symbols involving the IEP team members and other professionals (see Appendix B). For this population of students, the results make it clear that the TVIs must step up and be the leaders in communication skills, strategies, and intervention. There was also a significant correlation between students having an intellectual disability and the selection of an individualized system. The respondents found that it was more likely to select an individualized system for their student if they had an intellectual disability compared to any other added disability eligibility. However, there was no significant correlation between only having a visual impairment and the selection of standardized symbols for the student.

Students' Communication Level & AAC Selection

There was no statistically significant correlation between the students' communication level and type of symbols. However, it is clear based on the results that respondents overall found that the students' expressive communication level was consistently lower than their receptive communication levels. Even when the students had the lowest level of receptive communication being pre-symbolic communicators, there was an even split between the selection of individualized or standardized tactile AAC symbols. This could be due to the

professional choosing what they are familiar with, or thought was significant for the student at the time. This was not portrayed in the statistics, so it is not clear as to why or how the professionals were selecting the system, but it could be just a starting point for their students in through their own professional lens.

Training and Professionals

The questions relating to participants' perspectives on their pre-service training, when correlated with the type of symbol, did not portray any statistically significant responses. From the Likert scale questions around the professionals' confidence and training, some of the professionals did not feel trained at all and a select few felt well prepared. Based on the results of all three questions on this topic, the respondents who selected that they did not feel well prepared, felt moderately prepared, or felt well prepared were more often selecting individualized symbols for the student, not standardized symbols. However, when the respondent felt minimally prepared, which was the lowest rating, they were selecting standardized symbols. There were some respondents who selected minimally or moderately prepared when it came to confidence and preparedness of selecting the tactile AAC symbols.

When looking at the assessment-based questions (see Appendix B), specifically for FVLMA, 20 respondents selected that they did not base their initial selection of the FVLMA data collected on the student. This assessment is specifically designed for students with visual impairments. Other protocols such as the SLP protocols previously discussed that aid in the decision-making process for students' communication levels are the Communication Matrix (Brady et al., 2016), Dynamic AAC Goals Grid (DAAG-2; Brady et al., 2016), and Functional Communication Profile (Brady et al., 2016). Training programs can continue to provide access and knowledge about a variety of assessment tools and protocols that could be used for

communication skills and levels for students with complex support needs. If TVIs, SLPs, and SD teachers are not gaining hands-on experience or knowledge about a variety of protocols and communication assessments it would be likely that their decisions are being based off the assessments that they are most comfortable with or even know exist. Especially if the domain area of communication is not their level of expertise.

Limitations

There were limitations that affected the current study and should be considered when reviewing the findings and implications. The main limitation of the current study is the number of respondents . The limited sample size was a factor that affected the decision of computing descriptive and correlation statistics instead of a logistical regression. There was a specific targeted population of respondents for this study which made limitations on the criteria to complete the survey at all. Also, the limited timeline of the study could have been a reason for limitation on respondents. The survey was public for almost two and a half months but to a targeted an extremely specific population of respondents.

Another limitation that affected the current study was the experience of the professionals. The professionals completing the survey were asked to strictly focus on their caseload and students for the last three years. During the past three years, COVID-19 limited all interaction between professionals and their students. It could be likely that fewer IEP team implementations of tangible symbol interventions affected these professionals and their students in the past three years.

Implications and Future Directions

The current study holds several implications for TVIs, SD Teacher's, and SLP who have students with complex support needs with visual impairments on their caseloads. The initial

selection of tactile AAC symbols should not be solely in the hands of the TVIs. These professionals should be open to collaborating so the initial selection of tactile AAC symbols is an IEP team decision, informed by robust data. This would expand the number of respondents and could create more unique and significant correlations within the decision-making process and the factors that affect it. Further research should be conducted to examine and expand on the communication and collaborative process between professionals and the IEP team on the selection and determination of tactile AAC symbols for students with complex support needs. In addition, the widening of recruitment to more organizations not affiliated with visual impairments specifically should be considered. The extended duration of the survey should be considered as well to keep it open longer to allow more participation.

Future research should consider the use of standardized tactile AAC symbols with adaptations for individualized students. As a standardized tactile AAC symbols would allow for the individual students to interact and communicate through universal symbols, each student would also have their own individualized set unique to them. This study specifically looked at the two symbols separately and asked the respondents to choose between which one. Although the research collected for this study did not name any professionals using this combination of tactile AAC symbols, it was not focused on in our searches. There are also other factors that could be researched that could be significant to decide the selection of tactile AAC symbols, including, but not limited to the context in which the individual could communicate and their communication partners skills and supports with using the symbols. There are various implications for practice with the initial selection and finding of tactile AAC symbols for students. One of the many implications requires that communication expertise drives the decision while considering the other team members' thoughts and ideas. Another implication for practice

is that the initial selection of a tactile AAC symbol set might not always be the perfect fit for the specific student. Allowing the student multiple opportunities before deciding on another approach would be best as these symbols take time to process, learn, and understand.

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Appendix A

Operational Definitions

1. ***Tactile AAC*** is defined as an AAC symbols and symbols which are primarily used for their tactile features (e.g., whole or part object symbols, raised lines or textured components AAC symbols and symbols which are primarily used for their tactile features (e.g., whole or part object symbols, raised lines or textured components. If mounted onto cards, symbols may include print or braille labels. Students may engage with their tactile symbols through multi-sensory exploration.
2. ***Individualized Tactile AAC*** is defined as the individualized tactile AAC symbols are tactile objects/symbols (may or may not be mounted on cards or a board) where all or most of the symbols are unique to the student. In this case, IEP team members will design each symbol based on the lived experience of the student using the symbols. There may be a small number of symbols that are not unique to that student (e.g., every student in the class with a tactile AAC system uses the same symbol for the classroom teacher's name or days of the week).
3. ***Standardized Tactile AAC*** is defined as the standardized tactile AAC symbols are tactile objects/symbols (may or may not be mounted on cards or a board) where all or most of the symbols are selected from a pre-existing symbol dictionary (e.g., STACS or a classroom, school, or district wide tactile AAC dictionary). In this case, all or most of the symbols used by the student are not unique to the student. There may be a small number of symbols that are unique to that student (e.g., their name, family members' names, favorite activities).
4. ***Pre-service Training*** is defined as the pre-service training variables that allow the respondents to self-reflect on their own personal experiences of their training background and knowledge gained through educational programs.
    a. Three variables were focused on for this study that referred and focused on the professional's self-reflection and preparedness of determining if students with complex support needs should have a primarily tactile or visual AAC system, if students with complex support needs should have an individualized AAC system, and if students with complex support needs should have a standardized AAC system.
5. ***Functional Vision Options:***
    a. ***Low Vision*** is defined as a permanent and significant loss of visual function, including either visual acuity (the ability to see detail), visual field (ability to see a large area), or both. cannot be corrected with conventional glasses, contact lenses, surgery, or medication. (e.g., approximately 20/70-20/180 acuity or slightly reduced visual fields).
    b. ***Legally Blind is defined as a level of visual impairment defined by law either to limit allowed activities for safety reasons or determine disability eligibility for services.*** (e.g., 20/200 acuity with functional vision or visual fields of 20 degrees or less)
    c. ***Light perception*** is defined as knowing when a room light is turned on or off or being able to walk in a darkened room without any trouble.

d. ***No light perception*** is defined as an individual not being able to see anything. This happens when the connection between the eyes and brain is completely cut off due to brain damage, optic nerve detachment, or eyes have been removed.
e. ***Cortical/Brain-based visual impairment*** is defined as a decreased visual response due to a neurological problem affecting the visual part of the brain. An individual may have a variety of symptoms such as complete loss of visual sensation and of vision, lack of visual fixation and tracking, inability to perceive light and/or moving objects but can potentially see static objects, etc.

Appendix B

Tactile AAC Selection for Students with Visual Impairments Survey Questions

Consent Questions

1. In the 2020-21, 2021-22, or 2022-23 school years, have you worked with one or more students who are blind or visually impaired that used or was introduced to a tactile alternative/augmentative communication system (AAC)?By checking "Yes" I verify that in the past two years I have worked with one or more students with visual impairments that used or was introduced to a tactile alternative/augmentative communication system (AAC).
    a. Yes
    b. No
2. Are you employed as ONE of the following? Teacher of Students with Visual Impairments (TVI) Speech Language Pathologist (SLP) Severe Disabilities Teacher (e.g., classroom-based Teacher of Students with Severe, Multiple, or Low Incidence Disabilities) By checking "Yes" I verify that I am currently employed as a Teacher of Students with Visual Impairments (TVI) or a Speech Language Pathologist (SLP) or a Severe Disabilities Teacher. Note: You may be currently employed in this position, or no longer employed in this position but you were at the time that you participated in an IEP team making decisions about the initial selection of tactile AAC for a student with VI.
    a. Yes
    b. No
3. I agree to participate in this survey.
    a. Yes
    b. No

Participant Demographic Questions

4. I am currently employed as a: Note: You may be currently employed in this position, or no longer employed in this position but you were at the time that you participated in an IEP team making decisions about the initial selection of tactile AAC for a student with VI.
    a. Teacher of Students with Visual Impairments (TVI)
    b. Severe Disabilities Teacher (SD Teacher)
    c. Speech Language Pathologist (SLP)
5. I have been in this role for _____ years:
    a. Drop down menu: 1-35 years
6. I have prior training and experience as a _____, before entering the role selected above
    a. General education teacher
    b. Special education teacher
    c. Teacher of students with visual impairments
    d. Speech language pathologist
    e. Paraeducator
    f. Other

g. Not previously employed in education

Training & Background Knowledge

We'd like to learn a little bit about your training and experiences around AAC for students who are blind or visual impaired (VI) and have severe disabilities. Please answer the following questions rating how prepared you felt in each of these areas upon graduating from your training program.

***As educational terminology varies throughout the United States, please review the meaning of the terms we've included in this survey before proceeding. Tactile AAC: AAC systems and symbols which are primarily used for their tactile features (e.g., whole or part object symbols, raised lines or textured components). If mounted onto cards, symbols may include print or braille labels. Students may engage with their tactile symbols through multi-sensory exploration. Individualized Tactile AAC: Individualized tactile AAC symbols are tactile objects/symbols (may or may not be mounted on cards or a board) where all or most of the symbols are unique to the student. In this case, IEP team members will design each symbol based on the lived experience of the student using the symbols. There may be a small number of symbols that are not unique to that student (e.g., every student in the class with a tactile AAC system uses the same symbol for the classroom teacher's name or days of the week). Standardized Tactile AAC: Standardized tactile AAC symbols are tactile objects/symbols (may or may not be mounted on cards or a board) where all or most of the symbols are selected from a pre-existing symbol dictionary (e.g., STACS or a classroom, school, or district wide tactile AAC dictionary). In this case, all or most of the symbols used by the student are not unique to the student. There may be a small number of symbols that are unique to that student (e.g., their name, family members' names, favorite activities).

7. Generally, about tactile AAC for student with VI and severe disabilities
    a. Not prepared
    b. Minimally prepared
    c. Moderately prepared
    d. Well prepared
8. Determining if a student with VI and severe disabilities should have a primarily tactile or visual AAC system
    a. Not prepared
    b. Minimally prepared
    c. Moderately prepared
    d. Well prepared
9. Determine if a student with VI and severe disabilities should have an individualized AAC system
    a. Not prepared
    b. Minimally prepared
    c. Moderately prepared
    d. Well prepared
10. Determine if a student with VI and severe disabilities should have a standardized AAC system

a. Not prepared
b. Minimally prepared
c. Moderately prepared
d. Well prepared

11. How to create an individualized AAC system for students with VI and severe disabilities
    a. Not prepared
    b. Minimally prepared
    c. Moderately prepared
    d. Well prepared
12. How to select a standardized AAC system for students with VI and severe disabilities
    a. Not prepared
    b. Minimally prepared
    c. Moderately prepared
    d. Well prepared

Student Demographic Questions

Think about a single student who is blind or visually impaired and: 1. You worked in the past 2 years (2020- 21, 2021-22, or 2022-23 school years) 2. You participated in an IEP or planning discussion focused on the selection of a tactile AAC system. Please answer a few brief demographic questions about the student you have in mind.

13. During what school year was this conversation being held?
    a. 2020-21
    b. 2021-22
    c. 2022-23
14. In what grade was this student when you were having discussions on selecting a tactile AAC system?
    a. Early intervention
    b. Pre-K3
    c. Pre-K4
    d. Kindergarten
    e. 1st Grade
    f. 2nd Grade
    g. 3rd Grade
    h. 4th Grade
    i. 5th Grade
    j. 6th Grade
    k. 7th Grade
    l. 8th Grade
    m. 9th Grade
    n. 10th Grade
    o. 11th Grade
    p. 12th Grade
15. What was the student's primary education placement?
    a. Self-contained classroom

   b. Specialized school
   c. Inclusion setting (majority of classmates are peers without disabilities)
   d. Home-bound or hospital setting
   e. Early intervention in the home
16. Which of the following best describes the student's functional vision at the time the AAC system was being discussed?
   a. Low vision (e.g., approximately 20/70-20/180 acuity or slightly reduced visual fields)
   b. Legally blind (20/200) with functional vision or visual fields of 20 degrees or less
   c. Light perception only
   d. No light perception
   e. Cortical/Brain-based visual impairment (acuity unknown or may fluctuate)
   f. No diagnosed visual impairment; educational team suspected visual impairment
17. Which of the following additional disabilities/demographics listed best describe the student (check all that apply):
   a. Autism Spectrum Disorder
   b. Intellectual Disability Hearing Impairment
   c. Physical / Motor disability
   d. Speech / Language Impairment
   e. Deafblindness
   f. Other
   g. No other disabilities
18. Which of the following best describes the student's receptive level of communication abilities at the time tactile AAC was being discussed? Receptive communication occurs when a person understands the information being communicated to them through verbal and nonverbal modes.
   a. Pre-symbolic (e.g., communication with facial expressions and/or gestures)
   b. Symbolic (e.g., sign language, AAC symbols, eye gaze and/or written language)
   c. Verbal communicator (e.g., functional speech and/or spoken language)
19. Which of the following best describes the student's expressive level of communication abilities at the time tactile AAC was being discussed? Expressive communication occurs when a person shares their thoughts, wants, and needs with others through verbal and nonverbal communication.
   a. Pre-symbolic (e.g., communication with facial expressions and/or gestures)
   b. Symbolic (e.g., sign language, AAC symbols, eye gaze and/or written language)
   c. Verbal communicator (e.g., functional speech and/or spoken language)
20. Is this student an English Language Learner and/or live in a multilingual household?
   a. Yes
   b. No
21. Did the student have experience with any AAC prior to your introducing tactile AAC?
   a. No
   b. Yes
   c. I don’t know
22. What form of tactile AAC was ultimately selected for this student? Note: Individualized Symbols are symbols that were developed uniquely for this student. Standardized

Symbols are symbols that were selected from a classroom or school-wide tactile symbols dictionary or commercially available tactile symbols system, e.g., STACS

a. Individualized symbols
b. Standardized symbols

Professional Experience with AAC for Students with Visual Impairments

Thinking about the student you just described answer each of the following questions based on your experience with that student and their IEP team. Please answer the following questions rating to what extent you agree or disagree with each statement: Note: Individualized Symbols are symbols that were developed uniquely for this student. Standardized Symbols are symbols that were selected from a classroom or school-wide tactile symbols dictionary or commercially available tactile symbols system, e.g., STACS.

23. When selecting individualized or standardized AAC all IEP team members were included and contributed to the decision- making process
    a. Strongly Disagree
    b. Moderately Disagree
    c. Disagree Slightly
    d. Agree Slightly
    e. Moderately Agree
    f. Strongly Agree
24. I was the primary IEP member to determine that the student needs tactile AAC
    a. Strongly Disagree
    b. Moderately Disagree
    c. Disagree Slightly
    d. Agree Slightly
    e. Moderately Agree
    f. Strongly Agree
25. I was the primary IEP member who conducted assessments and analyzed the data collected to determine whether a student needed a standardized or individualized tactile AAC system
    a. Strongly Disagree
    b. Moderately Disagree
    c. Disagree Slightly
    d. Agree Slightly
    e. Moderately Agree
    f. Strongly Agree
26. I felt that the SLP and I should have collaborated when determining the tactile AAC format for my student
    a. Strongly Disagree
    b. Moderately Disagree
    c. Disagree Slightly
    d. Agree Slightly
    e. Moderately Agree
    f. Strongly Agree

27. As the TVI, I felt that I should make the initial selection of the tactile AAC format for my student
    a. Strongly Disagree
    b. Moderately Disagree
    c. Disagree Slightly
    d. Agree Slightly
    e. Moderately Agree
    f. Strongly Agree
28. As the SD Teacher, I felt that I should have made the initial selection of the tactile AAC format for my student
    a. Strongly Disagree
    b. Moderately Disagree
    c. Disagree Slightly
    d. Agree Slightly
    e. Moderately Agree
    f. Strongly Agree
29. As the SLP, I felt that I should have made the initial selection of the tactile AAC format for my student
    a. Strongly Disagree
    b. Moderately Disagree
    c. Disagree Slightly
    d. Agree Slightly
    e. Moderately Agree
    f. Strongly Agree
30. As the TVI, I felt that I needed to collaborate with other professionals (i.e., SD teacher, SLP) in order to decide on the initial selection of tactile AAC format for my student
    a. Strongly Disagree
    b. Moderately Disagree
    c. Disagree Slightly
    d. Agree Slightly
    e. Moderately Agree
    f. Strongly Agree
31. As the SD Teacher, I felt that I needed to collaborate with other professionals (i.e., TVI, SLP) in order to decide on the initial selection of tactile AAC format for my student
    a. Strongly Disagree
    b. Moderately Disagree
    c. Disagree Slightly
    d. Agree Slightly
    e. Moderately Agree
    f. Strongly Agree
32. As the SLP, I felt that I needed to collaborate with other professionals (i.e., SD teacher, TVI) in order to decide on the initial selection of tactile AAC format for my student
    a. Strongly Disagree
    b. Moderately Disagree
    c. Disagree Slightly
    d. Agree Slightly

    e. Moderately Agree
    f. Strongly Agree
33. Did data from a functional vision learning media assessment inform the IEP team's decision on the initial selection of tactile AAC for the student?
    a. Yes
    b. No
34. Did data from a communication assessment inform the IEP's decision on the initial selection of tactile AAC for the student?
    a. Yes
    b. No
35. Did data from any other assessments inform the IEP team's decision on the initial selection of tactile AAC for the student? (If yes, please describe)
    a. Yes
    b. No

Tactile AAC Materials

Thank you for answering the questions above. Now we want to know about how you obtain the tactile AAC equipment used for your student(s).

36. What best describes the tactile AAC selected for the student?
    a. Whole objects not mounted on a card or board
    b. Whole objects mounted on a card or board
    c. Part of an object not mounted on a card or board
    d. Part of an object mounted on a card or board
    e. Other (please describe)
37. Did you use a commercially available product (in whole or part) to develop the student's system of symbols? Please select all of the products that you used. If you used a source that's not listed, please check "other" and write in what you used.
    a. Standardized Tactile Augmentative Communication Symbols Kit (STACS)
    b. Tactile Connections Kit
    c. Symbols and Meaning Kit
    d. Other
    e. No commercial AAC materials were used
38. How would you describe the IEP team's access to resources to purchase or create tactile AAC for students? (Please check all that apply)
    a. The school was able to quickly purchase the materials.
    b. The IEP team ordered materials via quota funds (from APH).
    c. One or more IEP team members purchased the materials themselves.
    d. Other (please describe)

Now we'd like to ask a few questions about how and where you expected to implement the students tactile AAC within the rest of the month after initial selection was made. To what extent did you and the IEP team plan to implement the new tactile AAC system in the following situations?

39. Daily schedule in the classroom
    a. No AAC Implementation Planned
    b. Intended But Not Implemented
    c. Infrequently Implemented
    d. Periodically Implemented
    e. Consistently Implemented with student
40. Token board (e.g., to choose a reward or reinforcement)
    a. No AAC Implementation Planned
    b. Intended But Not Implemented
    c. Infrequently Implemented
    d. Periodically Implemented
    e. Consistently Implemented with student
41. Communication system at school
    a. No AAC Implementation Planned
    b. Intended But Not Implemented
    c. Infrequently Implemented
    d. Periodically Implemented
    e. Consistently Implemented with student
42. Communication system at home
    a. No AAC Implementation Planned
    b. Intended But Not Implemented
    c. Infrequently Implemented
    d. Periodically Implemented
    e. Consistently Implemented with student
43. Communication system in the community
    a. No AAC Implementation Planned
    b. Intended But Not Implemented
    c. Infrequently Implemented
    d. Periodically Implemented
    e. Consistently Implemented with student
44. Reading books
    a. No AAC Implementation Planned
    b. Intended But Not Implemented
    c. Infrequently Implemented
    d. Periodically Implemented
    e. Consistently Implemented with student
45. Class worksheets or other instructional materials
    a. No AAC Implementation Planned
    b. Intended But Not Implemented
    c. Infrequently Implemented
    d. Periodically Implemented
    e. Consistently Implemented with student
46. Routine-based instruction
    a. No AAC Implementation Planned
    b. Intended But Not Implemented
    c. Infrequently Implemented

d. Periodically Implemented
e. Consistently Implemented with student